



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

Samples of program outcomes and courses of all departments displayed in college website:

The screenshot shows the website for Kshatriya College of Engineering. The navigation menu includes Home, About, Departments, Admissions, Facilities, Technical Chapters, Academic, Training, Alumni, Functional, RTI, Administration, Gallery, NAAC, and C. The main content area is titled 'Departments' and lists CSE, ECE, EEE, and CIVIL. The CIVIL department is selected, showing its Program Educational Objectives (PEOs) and Program Outcomes (POs). The PEOs are:

- PEO 1: To provide the student community with a sound knowledge in basic science and Mathematics, engineering fundamentals, logical, statistical and scientific principals underlying information processing.
- PEO 2: To provide the student community equip with basic communication skills professional and ethical attitude, soft skills, multidisciplinary approach and ability to relate engineering issues to broader social context.
- PEO 3: To develop the student community the ability for pursuing higher studies, with appropriate skills of management, research and development, consultancy and entrepreneurship.

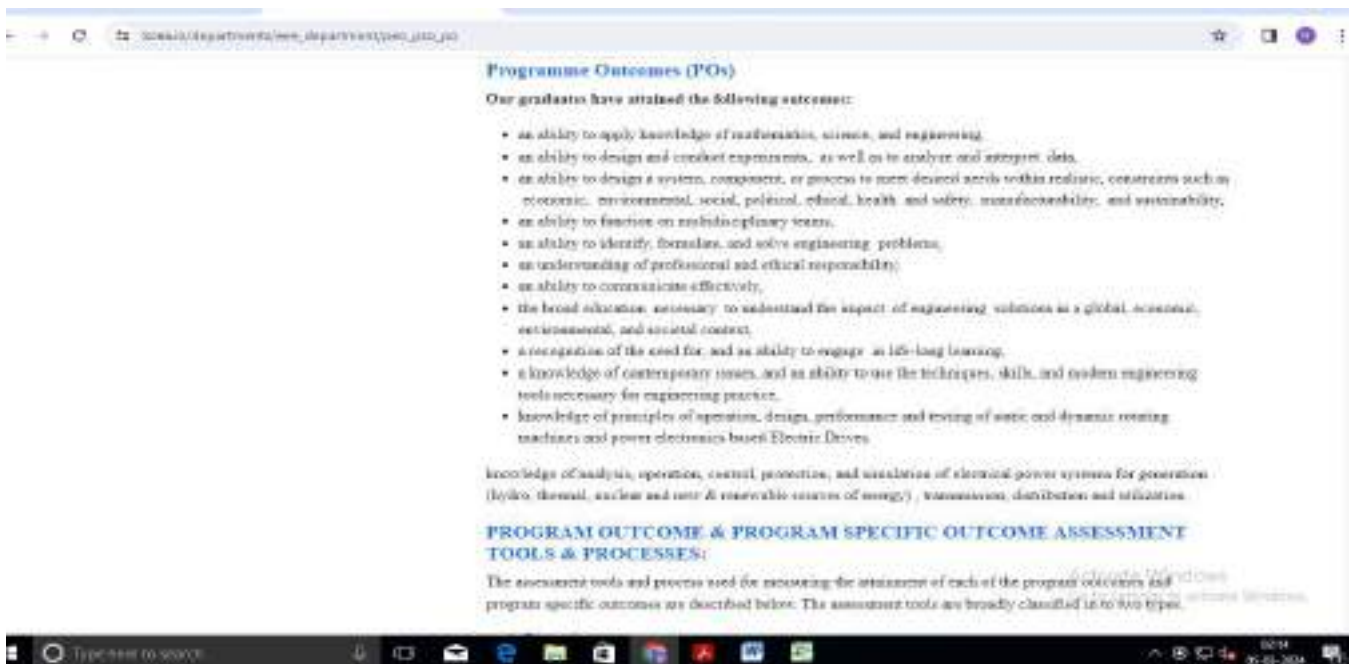
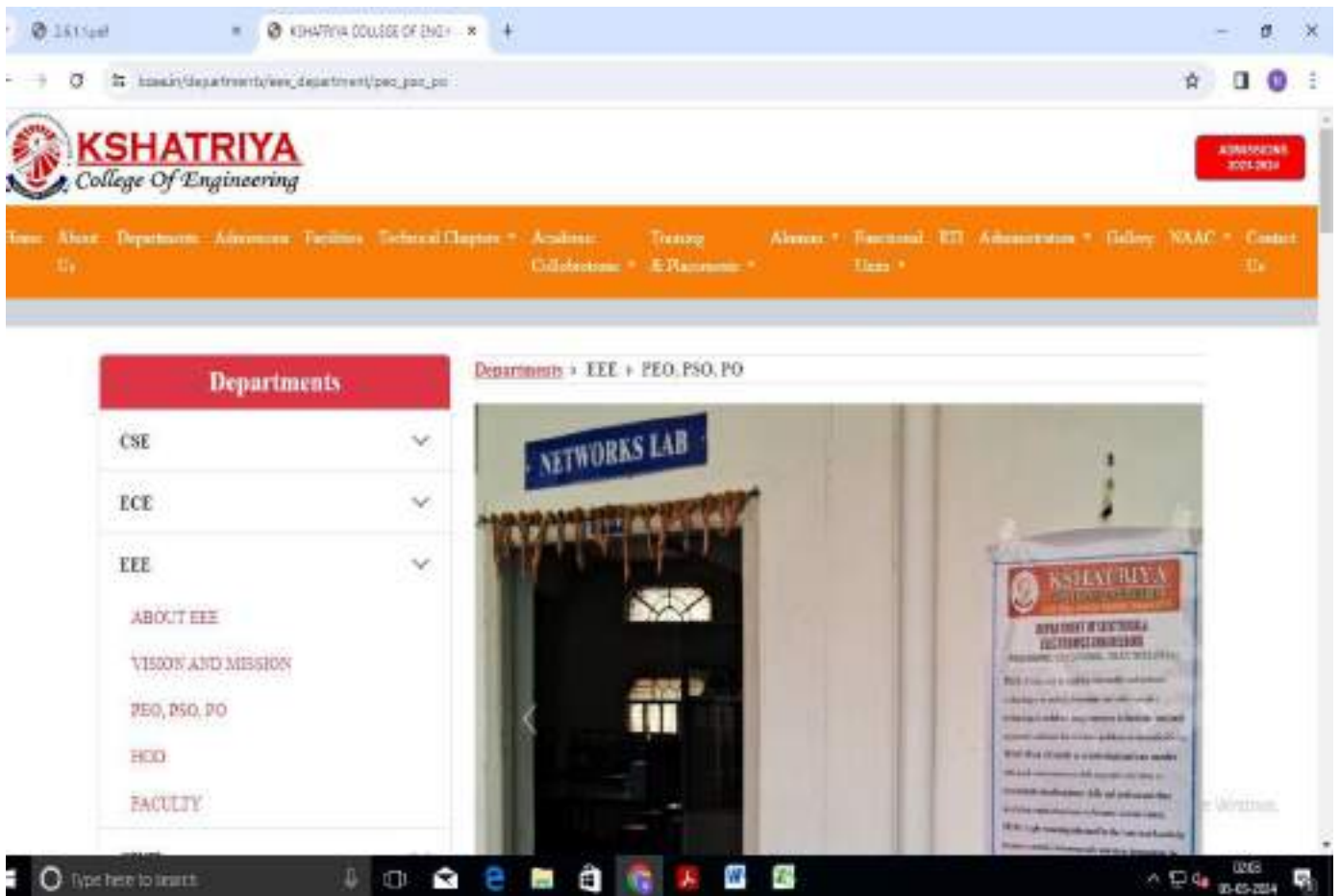
The Program Outcomes (POs) are:

- PO 1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering



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The screenshot shows a web browser window displaying the Kshatriya College of Engineering website. The URL is kcea.in/department/mech_department/peo_pso_po. The page features a navigation menu with links for Home, About, Departments, Admissions, Facilities, Technical Chapters, Academic, Training, Alumnus, Functional, RIT, Administration, Gallery, NAAC, Contact Us, Collaborators, & Placements, and Units. A red button for 'ADMISSIONS 2023-2024' is visible in the top right corner.

The main content area is titled 'Departments' and lists various departments: CSE, ECE, EEE, CIVIL, and MECH. The MECH department is selected, and its page displays 'About MECH', 'VISION AND MISSION', and 'PEO, PSO, PO'. The 'PROGRAM OUTCOMES (POs)' section lists six outcomes:

- 1. **ENGINEERING KNOWLEDGE:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. **PROBLEM ANALYSIS:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 3. **DESIGN/DEVELOPMENT OF SOLUTIONS:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 4. **CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. **MODERN TOOL USAGE:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- 6. **THE ENGINEER AND SOCIETY:** Apply reasoning informed by the contextual knowledge to assess



PROGRAMME EDUCATIONAL OBJECTIVES (PEO'S):

The Electronics & Communication Engineering program educational objectives prepare students to:

PEO1: To prepare students with strong engineering knowledge and technical competence to use techniques, skills and modern engineering tools that allow them to work effectively as electronics and communication engineer.

PEO2: To provide students with solid foundation in mathematics, Sciences and basic engineering breadth they cover multi-disciplinary subjects enabling them to comprehend, analyze engineering problems and develop solutions.

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PEO2: To provide students with solid foundation in mathematics, Sciences and basic engineering breadth they cover multi-disciplinary subjects enabling them to comprehend, analyze engineering problems and develop solutions.

PEO3: To prepare students to excel in the graduate program; to succeed in industry / technical profession and also enable to pursue higher studies and continued life-long learning.

PROGRAM OUTCOMES (PO'S):

A graduate of the Electronics and Communication Engineering Program will demonstrate:

PO1: Engineering knowledge: Apply the knowledge of mathematics, sciences, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

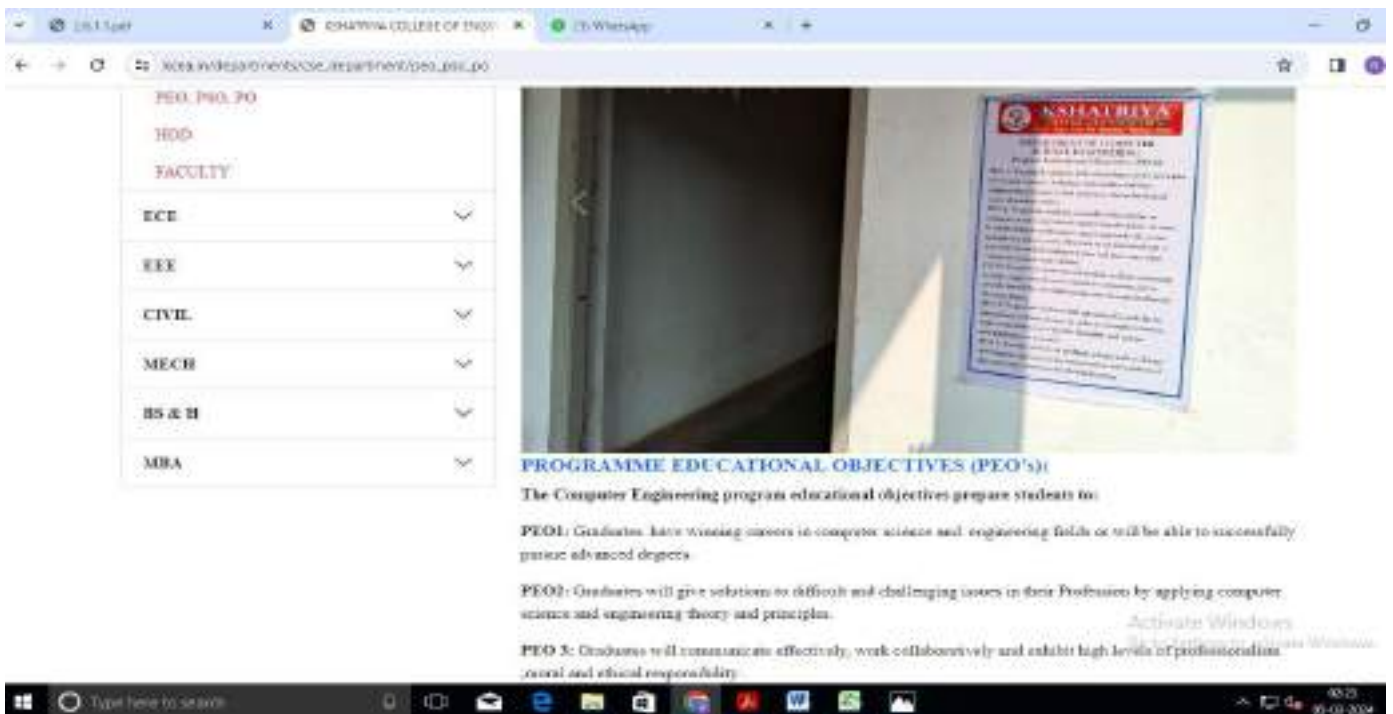
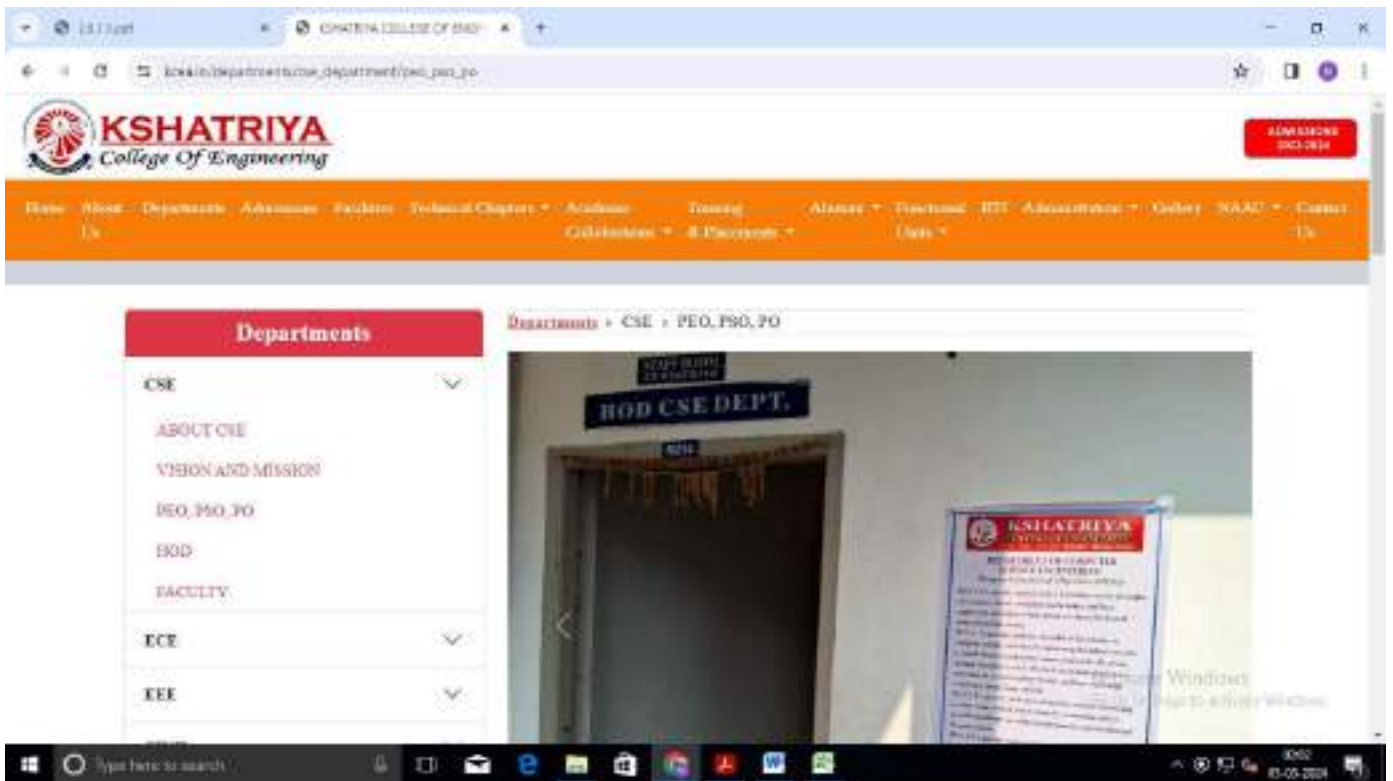
PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide



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PROGRAMME EDUCATIONAL OBJECTIVES (PEO's):

The Computer Engineering program educational objectives prepare students to:

- PEO1: Graduates have winning careers in computer science and engineering fields or will be able to successfully pursue advanced degrees.
- PEO2: Graduates will give solutions to difficult and challenging issues in their Profession by applying computer science and engineering theory and principles.
- PEO3: Graduates will communicate effectively, work collaboratively and exhibit high levels of professionalism, moral and ethical responsibility.
- PEO4: Graduates will have inclination in life-long learning, professional and skilled development to adapt to dynamic work environment.

PROGRAM OUTCOMES (PO'S):

A graduate of the Computer Science and Engineering Program will demonstrate:

- PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3: Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.



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ADMISSIONS
2023-2024

Home About Departments Admissions Facilities Technical Chapters Academic Training Alumni Functional RTI Administration Gallery NAAC Collaborations & Placements Units

Departments	
CSE	▼
ECE	▼
EEE	▼
CIVIL	▼
MECH	▼
BS & H	▲
ABOUT BS & H	
VISION AND MISSION	

Departments > BSH > PEO, PSO, PO

Programme Educational Objectives (PEOs)

PEO 1: To provide the student community with a sound knowledge in basic science and Mathematics, engineering fundamentals, logical, statistical and scientific principals underlying information processing.

PEO 2: To provide the student community equip with basic communication skills professional and ethical attitude, soft skills, multidisciplinary approach and ability to relate engineering issues to broader social context.

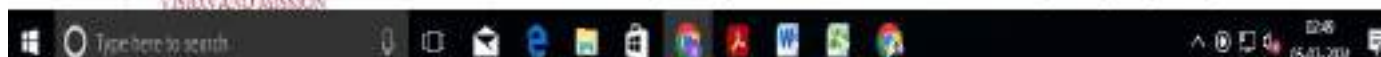
PEO 3: To develop the student community the ability for pursuing higher studies, with appropriate skills of management, research and development, consultancy and entrepreneurship.

PROGRAM OUTCOMS (POs)

Engineering Graduates will be able to:

PO 1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO 2: Problem analysis: Identify, formulate, review research literature, and analyze complex engineering





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The screenshot shows the website of Kshatriya College of Engineering. The browser address bar indicates the URL: kcea.in/departments/mba_department/peo_po_po. The page features a navigation menu with links for Home, About, Departments, Admissions, Facilities, Technical Chapters, Academic, Training, Alumni, Functional, RTI Administration, Gallery, NAAC, and Contact Us. A red 'ADMISSIONS 2023-24' button is visible in the top right corner.

The main content area is titled 'Departments' and includes a sidebar with a list of departments: CSE, ECE, EEE, CIVIL, MECH, BS & H, and MBA. The selected 'MBA' department page displays the following information:

Departments > MBA > PEO, PSO, PO

MBA Department PEO'S & PO'S PROGRAM EDUCATIONAL OBJECTIVES (PEOS): To become a top institute, as per our vision, we need to nurture good quality students who can meet the professional and personal challenges in an organization where ever they were employed especially highly competitive environment so as to enable them as holistic professional. The graduates are to be equipped with contemporary management knowledge, skills and technologies to make them as leaders for the corporate entities. These PEO are well synchronized with the institute's vision and mission.

PROGRAM EDUCATION OBJECTIVES:

- 1. Make students to apply techniques of business analysis, data management and problem-solving skills in order to support business management decision-making in the field of relevance.
- 2. Instillate leadership skills needed for implementing and coordinating organizational activities and managing change to explore business problems in depth for developing their functional knowledge to think strategically and to lead, motivate and manage teams across borders.
- 3. Nurture with abilities to integrate business knowledge and management techniques to aid planning and control in a changing environment and to enhance better career paths. These PEOs are designed to be attained by all the post-graduates within 2 years of their education.



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Civil engineering I & II sem out comes for Academic Year 2021-2022

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SNO	YEAR/SEM	COURSE NAME	COURSE OUTCOMES
1	II/I	Surveying and Geomatics	CO1: Apply the knowledge to calculate angles, distances and levels
			CO2: Identify data collection methods and prepare field notes
			CO3: Understand the working principles of survey instruments, measurement errors and corrective measures
			CO4: Interpret survey data and compute areas and volumes, levels by different type of equipment and relate the knowledge to the modern equipment and methodologies
2	II/I	Engineering Geology	CO1: Site characterization and how to collect, analyze, and report geologic data using standards in engineering practice
			CO2: The fundamentals of the engineering properties of Earth materials and fluids.
			CO3: Rock mass characterization and the mechanics of planar rock slides and topples
			CO4: understand weathering process and mass movement
3	II/I	Strength of Materials – I	CO1: To understand the nature of stresses developed in simple geometries such as bars, cantilevers and beams for various types of simple loads
			CO2: To calculate the elastic deformation occurring in simple members for different types of loading
			CO3: To show the plane stress transformation with a particular coordinate system for different orientation of the plane.
			CO4: To know different failure theories adopted in

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9

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			designing of structural members
4	II/I	Probability and Statistics	CO1: Formulate and solve problems involving random variables and apply statistical methods for analysing experimental data
5	II/I	Fluid Mechanic	CO1: Understand the broad principles of fluid statics, kinematics and dynamics
			CO2: Understand definitions of the basic terms used in fluid mechanics and characteristics of fluids and its flow
			CO3: Understand classifications of fluid flow
			CO4: Be able to apply the continuity, momentum and energy principles
6	II/I	Surveying lab	CO1: Apply the principle of surveying for civil Engineering Applications
			CO2: Calculation of areas, Drawing plans and contour maps using different measuring equipment at field level
			CO3: Determine the distances between two inaccessible with compass
			CO4: Write a technical laboratory report
7	II/I	Strength Of Materials Lab	CO1: Configure & Operate a data acquisition system using various testing machines of solid materials
			CO2: Compute and Analyze engineering values (e.g. stress or strain) from laboratory measurements
			CO3: Determine the Hardness of Metals
			CO4: Write a technical laboratory report
8	II/I	Engineering Geology Lab	CO1: Understands the method and ways of investigations required for Civil Engg projects
			CO2: Identify the various rocks, minerals depending on geological classifications
			CO3: Will able to learn to couple geologic expertise with the engineering properties of rock and unconsolidated

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10

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			materials in the characterization of geologic sites for civil work projects and the quantification of processes such as rock slides and settlement.
			CO4: Write a technical laboratory report
9	III/I	Constitution Of India	CO1: Understand the emergency and Evaluation of I To analyze and solve electrical circuits using network laws and theorems and constitution
			CO2: Understand the Structure and Composition of Indian constitution
			CO3: Understand and analyse the Federalism in the Indian Content
			CO4: Understand and analyse the three organ of the states in the contemporary scenario
10	II/II	Basic electrical & 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
11	II/II	Basic mechanical engineering for civil engineers	CO1: To understand the mechanical equipment for the usage at civil engineering systems,
			CO2: To familiarize with the general principles and requirement for refrigeration, manufacturing
			CO3: To realize the techniques employed to construct civil engineering systems,
			CO4: Learning the design and working process of machine tools for the usage of construction fields
			CO1: Define the Basic terminology that is used in the industry



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12	II/II	Building materials, construction and planning	CO2: Categorize different building materials, properties and their uses
			CO3: Understand the Prevention of damage measures and good workmanship
			CO4: Explain different building services
13	II/II	Strength of Materials – II	CO1: To evaluate the strains and deformation that will result due to the elastic stresses developed within the materials for simple types of loading
			CO2: Analyze strength and stability of structural members subjected to Direct, and Direct and Bending stresses.
			CO3: Understand and evaluate the shear center and unsymmetrical bending
			CO4: 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
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 behaviour of members for static and dynamic loading.

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12

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			CO4: Calculate the stiffness parameters in beams and pin jointed trusses
16	II/II	Computer Aided Civil Engineering Drawing	CO1: Use Auto Cad commands for Drawing 2D & 3D Building Drawing required for different Civil Eng. application
			CO2: Plan & Draw the Civil Eng. Building as per aspect and orientation
			CO3: Presenting Drawing as per user requirements and preparation of Technical report
17	II/II	Hydraulics & hydraulic machinery lab	CO1: Describe the basic measurement techniques of fluid mechanics and its appropriate application.
			CO2: Interpret the results obtained in the laboratory for various experiments
			CO3: Discover the practical working of Hydraulic machines- different types of Turbines, Pumps, and other miscellaneous hydraulics machines.
			CO4: 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 identify and characterize diodes and various types of transistors
19	II/II	Gender sensitization lab	CO1: To develop students' sensibility with regard to issues of gender in contemporary India.
			CO2: To provide a critical perspective on the socialization of men and women.
			CO3: To introduce students to information about some key

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13

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			biological aspects of genders.
			CO4: To expose the students to debates on the politics and economics of work.
20	III/I	Structural analysis – II	<p>CO1: Analyze the two hinged arches</p> <p>CO2: Solve statically indeterminate beams and portal frames using classical methods</p> <p>CO3: Sketch the shear force and bending moment diagrams for indeterminate structures.</p> <p>CO4: Formulate the stiffness matrix and analyze the beams by matrix methods</p>
21	III/I	Geotechnical engineering	<p>CO1: Characterize and classify the soils</p> <p>CO2: Able to estimate seepage, stresses under various loading conditions and compaction characteristics</p> <p>CO3: Able to analyse the compressibility of the soils</p> <p>CO4: Able to understand the strength of soils under various drainage conditions</p>
22	III/I	Structural engineering – I (RCC)	<p>CO1: Compare and Design the singly reinforced, doubly reinforced and flanged sections.</p> <p>CO2: Design the axially loaded, uniaxial and biaxial bending columns.</p> <p>CO3: Classify the footings and Design the isolated square, rectangular and circular footings</p> <p>CO4: Distinguish and Design the one-way and two-way slabs.</p>
23	III/I	Transportation engineering	<p>CO1: An ability to apply the knowledge of mathematics, science and engineering in the areas of traffic engineering, highway development and maintenance</p> <p>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</p>



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			<p>assess the suitability of these materials for construction of highways.</p> <p>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.</p> <p>CO4: 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.</p>
24	III/I	Concrete technology (professional elective – i)	<p>CO1: Determine the properties of concrete ingredients i.e. cement, sand, coarse aggregate by conducting different tests. Recognize the effects of the rheology and early age properties of concrete on its long-term behavior</p> <p>CO2: Apply the use of various chemical admixtures and mineral additives to design cement-based materials with tailor-made properties</p> <p>CO3: Use advanced laboratory techniques to characterize cement-based materials.</p> <p>CO4: Perform mix design and engineering properties of special concretes such as high-performance concrete, self-compacting concrete, and fibre reinforced concrete.</p>
25	III/I	Engineering economics and accountancy	<p>CO1: To perform and evaluate the future worth of the alternative projects and appraise the projects by using traditional and DFC methods</p> <p>CO2: To carry out the cost benefit analysis of project and calculate BEP different alternative projects</p>
26	III/I	Highway engineering & concrete technology lab	<p>CO1: Categorize the test on materials used Civil Engineering Building & Pavement constructions</p> <p>CO2: To perform the tests on concrete for it characterization.</p> <p>CO3: To Design Concrete Mix Proportioning by Using Indian Standard Method.</p>



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			CO4: Examine the tests performed for Bitumen mixes.
27	III/I	Geotechnical engineering lab	CO1: At the end of the course, the student will be able to Classify and evaluate the behaviour of the soils subjected to various loads.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
28	III/I	Advance communication skills lab	CO1: To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3: To prepare all the students for their placements.
29	III/I	INTELLECTUAL PROPERTY RIGHTS	CO1: Intellectual property ,International Organization, Agencies and treaties and importance of Intellectual Property rights
			CO2: Purpose and Function of Trade market ,Acquisition of trade market rights
			CO3: Foundation of patent law ,Patent searching process, ownership rights and transfer
30	III/I	Hydrology and 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
31	III/I	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
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
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
34	III/II	Prestressed concrete (professional elective – II)	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
			CO1: Understand about the equipment used to conduct the test procedures
35	III/II	Environmental engineering lab	CO2: Perform the experiments in the lab
			CO3: Examine and Estimate water, waste water and soil Quality
			CO4: Compare the water, air quality standards with prescribed standards set by the local governments



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 knowledge about different types of resources like land, water, mineral & energy and also the effect of environmental by the usage of these resources
			CO2: Get the information about the ecosystem and also its functions like food ecological pyramids
			CO3: Gain the knowledge about the different types of pollutions and their control technology, waste water treatment, bio medical waste management etc
38	IV/I	Estimation, costing and project management	CO1: understand the technical specifications for various works to be performed for a project and how they impact the cost of a structure
			CO2: quantify the worth of a structure by evaluating quantities of constituents, derive their cost rates and build up the overall cost of the structure
			CO3: understand how competitive bidding works and how to submit a competitive bid proposal.
			CO4: An idea of how to optimize construction projects based on costs
39	IV/I	Ground improvement techniques (PE – III)	CO1: Know the necessity of ground improvement
			CO2: Understand the various ground improvement techniques available
			CO3: Select & design suitable ground improvement technique for existing soil conditions in the field.
			CO1: Know types of water retaining structures for multiple purposes and its key parameters considered for planning and



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40	IV/I	Irrigation and hydraulic structures (PE-IV)	designing
			CO2: Understand details in any Irrigation System and its requirements
			CO3: Know, Analyze and Design of a irrigation system components
41	IV/I	Professional practice, law & ethics	CO1: The students will understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
			CO2: The students will learn the rights and responsibilities as an employee, team member and a global citizen
42	IV/I	Principle of entrepreneurship	CO1: understanding the fundamentals of Entrepreneurship ,including concepts like opportunity recognition, innovation and risk management
			CO2: Developing the skills in business planning, including crafting a business models, conducting market research and creating marketing strategy.
43	IV/II	Solid waste management (PE – V)	CO1: Identify the physical and chemical composition of solid wastes
			CO2: Analyze the functional elements for solid waste management.
			CO3: Understand the techniques and methods used in transformation, conservation, and recovery of materials from solid wastes
			CO4: Identify and design waste disposal systems
44	IV/II	Urban transportation planning (PE – VI)	CO1: To cover concepts of Transportation planning, various modes, transit systems and their suitability.
			CO2: To give idea of modeling in planning, to develop the methodology of travel demand modeling for Urban Transportation Systems
			CO3: To provide knowledge of Land use planning and transportation interaction



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45	IV/II	Non convention of source energy	<p>CO1:demonstrate the generation of electricity for various Non conventional source of energy,have a working knowledge on types of fuel cells.</p> <p>CO2:Estimate solar energy ,utilisation of it,principle involved in solar energy collection and conversion of it in electricity generation</p>


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Kshatriya College of Engg.
CHEPUR-ARMOOR - 503 224
Dist: Nizamabad



Electrical & Electronics Engineering I & II Sem Course outcomes for the

Academic year 2021-2022

S.NO.	YEAR/SEM	COURSE NAME	Course Outcomes
1	II/I	ENGINEERING MECHANICS	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, curvilinear, rotatory motion and rigid body motion.
			CO5: Solve problems using work energy equations for translation, fixed axis rotation and planar motion and solve problems of vibration.
2	II/I	ELECTRICAL CIRCUIT Analysis	CO1: Apply network theorems for the analysis of electrical circuits.
			CO2: Obtain the transient and steady-state response of electrical circuits.
			CO3: Analyze circuits in the sinusoidal steady-state (single-phase and three-phase).



			CO4: Analyze two port circuit behavior.
3	II/I	ANALOG ELECTRONICS	CO1: Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques
			CO3: Design and analyze various rectifiers, small signal amplifier circuits.
			CO4: Design sinusoidal and non-sinusoidal oscillators.
			CO5: A thorough understanding, functioning of OP-AMP, design OP-AMP based circuits with linear integrated circuits
4	II/I	ELECTRICAL MACHINES - I	CO1: Identify different parts of a DC machine & understand its operation
			CO2: Carry out different testing methods to predetermine the efficiency of DC machines
			CO3: Understand different excitation and starting methods of DC machines
			CO4: Control the voltage and speed of a DC machines
			CO5: Analyze single phase and three phase transformers circuits.
			CO1: To understand the basic laws of electromagnetism.
			CO2: To obtain the electric and magnetic fields for



5	II/I	ELECTROMAGNETIC FIELDS	simple configurations under static conditions.
			CO3: To analyze time varying electric and magnetic fields.
			CO4: To understand Maxwell's equation in different forms and different media.
			CO5: To understand the propagation of EM waves.
6	II/I	ELECTRICAL MACHINES LAB -I	CO1: Start and control the Different DC Machines
			CO2: Assess the performance of different machines using different testing methods
			CO3: Identify different conditions required to be satisfied for self - excitation of DC Generators.
			CO4: Separate iron losses of DC machines into different components
7	II/I	ANALOG ELECTRONICS LAB	CO1: Know the characteristics, utilization of various components.
			CO2: Understand the biasing techniques
			CO3: Design and analyze various rectifiers, small signal amplifier circuits
			CO4: Design sinusoidal and non-sinusoidal oscillators.
			CO5: A thorough understanding, functioning of OP-AMP, designs OP-AMP based circuits with linear integrated circuits.
8	II/I	ELECTRICAL CIRCUITS LAB	CO1: Analyze complex DC and AC linear circuits
			CO2: Apply concepts of electrical circuits across engineering
			CO3: Evaluate response in a given network by



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			using theorems
9	II/II	GENDER SENSITIZATION LAB	CO1: Understanding of important issues related to gender in contemporary India.
			CO2: Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
			CO3: Students will develop a sense of appreciation of women in all walks of life.
			CO4: Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.
10	II/II	LAPLACE TRANSFORMS, Numerical Methods And Complex Variables	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2: Find the root of a given equation.
			CO3: Estimate the value for the given data using interpolation
			CO4: Find the numerical solutions for a given ODE's
			CO5: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems
			CO6: Taylor's and Laurent's series expansions of complex function
11	II/II	Electrical Machines –	CO1: Understand the concepts of rotating magnetic fields.
			CO2: Understand the operation of ac machines



		ii	CO3: Analyze performance characteristics of ac machines.
12	II/II	Digital Electronics	CO1: Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion
			CO4: Be able to use PLDs to implement the given logical problem.
13	II/II	Control Systems	CO1: Understand the modeling of linear-time-invariant systems using transfer function and state-space representations
			CO2: Understand the concept of stability and its assessment for linear-time invariant systems
			CO3: Design simple feedback controllers.
14	II/II	Power System-I	CO1: Understand the concepts of power systems
			CO2: Understand the operation of conventional generating stations and renewable sources of electrical power.
			CO3: Evaluate the power tariff methods
			CO4: Determine the electrical circuit parameters of transmission lines
			CO5: Understand the layout of substation and underground cables and corona.



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15	II/II	Digital Electronics Lab	CO1: Understand working of logic families and logic gates.
			CO2: Design and implement Combinational and Sequential logic circuits.
			CO3: Understand the process of Analog to Digital conversion and Digital to Analog conversion.
			CO4: Be able to use PLDs to implement the given logical problem.
16	II/II	Electrical Machines Lab -II	CO1: Assess the performance of different machines using different testing methods
			CO2: To convert the Phase from three phase to two phase and vice
			CO3: Compensate the changes in terminal voltages of synchronous generator after estimating the change by different methods
			CO4: Control the active and reactive power flows in synchronous machines
			CO5: Start different machines and control the speed and power factor
17	II/II	Control Systems Lab	CO1: How to improve the system performance by selecting a suitable controller and/or a compensator for a specific application
			CO2: Apply various time domain and frequency domain techniques to assess the system performance
			CO3: Apply various control strategies to different

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26

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			applications(example: Power systems, electrical drives etc)
			CO4: Test system controllability and observability using state space representation and applications of state space representation to various systems
18	II/II	CONSTITUTION OF INDIA	CO1: Understand the meaning and importance of Constitution
			CO2: Scheme of the fundamental rights
			CO3: Parliamentary Form of Government in India – The constitution powers and status of the President of India, Amendment of the Constitutional Powers and Procedure
			CO4: The scheme of the Fundamental Duties and its legal status, The Directive Principles of State Policy – Its importance and implementation
19	III/I	Power Electronics	CO1: Understand the differences between signal level and power level devices.
			CO2: Analyze controlled rectifier circuits.
			CO3: Analyze the operation of DC-DC choppers.
			CO4: Analyze the operation of voltage source inverters.
20	III/I	Power System –II	CO1: Analyze transmission line performance.
			CO2: Apply load compensation techniques to control reactive power
			CO3: Understand the application of per unit quantities
			CO4: Design over voltage protection and insulation

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27

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			coordination
			CO5: Determine the fault currents for symmetrical and unbalanced fault.
21	III/I	Measurements And Instrumentation	CO1: Understand different types of measuring instruments, their construction, operation and characteristics
			CO2: Identify the instruments suitable for typical measurements
			CO3: Apply the knowledge about transducers and instrument transformers to use them effectively.
			CO4: Apply the knowledge of smart and digital metering for industrial applications
22	III/I	High Voltage Engineering	CO1: Understand the basic physics related to various breakdown processes in solid, liquid and gaseous insulating materials
			CO2: Knowledge of generation and measurement of D.C,A.C,& Impulse voltages.
			CO3: Knowledge of tests on H. V. equipment and on insulating materials, as per the standards.
			CO4: Knowledge of how over-voltages arise in a power system, and protection against these over-voltages.
23	III/I	Business Economics And Financial Analysis	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business
			CO2: The Demand, Supply, Production, Cost,



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			Market Structure, Pricing aspects are learnt.
			CO3: Students can study the firm's financial position
			CO4: by analyzing the Financial Statements of a Company.
24	III/I	Power System Simulation Lab	CO1: Perform various transmission line calculations
			CO2: Understand Different circuits time constants
			CO3: Analyze the experimental data and draw the conclusions.
25	III/I	Power Electronics Lab	CO1: Understand the operating principles of various power electronic converters.
			CO2: Use power electronic simulation packages & hardware to develop the power converters.
			CO3: Analyze and choose the appropriate converters for various applications
26	III/I	MEASUREMENTS AND INSTRUMENTATION LAB	CO1: To choose instruments, test any instrument
			CO2: Find the accuracy of any instrument by performing experiment
			CO3: Calibrate PMMC instrument using D.C potentiometer
27	III/I	ADVANCED COMMUNICATION SKILLS LAB	CO1: Student will improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3: Students will prepare all for their placements.
			CO4: Course should be a laboratory course to enable students to use 'good' English and Gathering

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29

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			ideas and information to organize ideas relevantly and coherently.
28	III/I	INTELLECTUAL PROPERTY RIGHTS	CO1: Recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights.
			CO2: students to understand the statutory provisions of different forms of IPRs in simple forms.
			CO3: Learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design
			CO4: students to keep their IP rights alive.
29	III/II	Disaster Preparedness & Planning Management	CO1: the application of Disaster Concepts to Management
			CO2: Analyzing Relationship between Development and Disasters
			CO3: Ability to understand Categories of Disasters
			CO4: Realization of the responsibilities to society.
30	III/II	POWER SYSTEM OPERATION AND CONTROL	CO1: Understand operation and control of power systems.
			CO2: Analyze various functions of Energy Management System (EMS) functions.
			CO3: Analyze whether the machine is in stable or unstable position
			CO4: Understand power system deregulation and restructuring
31	III/II	Signals & Systems	CO1: Differentiate various signal functions.
			CO2: Represent any arbitrary signal in time and frequency domain.
			CO3: Understand the characteristics of linear time invariant systems
			CO4: Analyze the signals with different transform

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30

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			technique
32	III/II	Microprocessors & Microcontrollers	CO1: Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
33	III/II	Power System Protection	CO1: Compare and contrast electromagnetic, static and microprocessor-based relays
			CO2: Apply technology to protect power system components
			CO3: Select relay settings of over current and distance relays.
			CO4: Analyze quenching mechanisms used in air, oil and vacuum circuit breakers
34	III/II	Power System Lab	CO1: Perform various load flow techniques
			CO2: Understand Different protection methods
			CO3: Analyze the experimental data and draw the conclusions.


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35	III/II	Microprocessors & Microcontrollers Lab	CO1: Assembly Language Programs to 8086 to Perform 1. Arithmetic, Logical, String Operations on 16 Bit and 32-Bit Data.
			CO2: Bit level Logical Operations, Rotate, Shift, Swap and Branch Operations.
			CO3: Assembly Language Programs to Perform Arithmetic (Both Signed and Unsigned) 16 Bit Data Operations, Logical Operations (Byte and Bit Level Operations), Rotate, Shift, Swap and Branch Instructions
			CO4: Time delay Generation Using Timers of 8051
			CO5: Serial Communication from / to 8051 to / from I/O devices
36	III/II	Signals and Systems lab	CO1: Understand the concepts of continuous time and discrete time systems.
			CO2: Analyse systems in complex frequency domain
			CO3: Understand sampling theorem and its implications.
37	III/II	Hvdc Transmission	CO1: Compare EHV AC and HVDC system and to describe various types of DC links
			CO2: Analyze Graetz circuit for rectifier and inverter mode of operation
			CO3: Describe various methods for the control of HVDC systems and to perform power flow



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(Affiliated to JNTU Hyderabad & Approved by AICTE)

			analysis in AC/DC systems
			CO4: Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters
38	III/II	ENVIRONMENTAL SCIENCE	CO1: Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
39	IV/I	PRINCIPLES OF ENTREPRENEURSHIP	CO1: Ability to solve professional problems by using scientific methods and procedures
			CO2: Coherent mastering of basic knowledge, acquired mostly in other compulsory courses, and combining of knowledge from different areas and use of knowledge in business environment
			CO3: Capability of search of new information in the area of entrepreneurship in literature and practice and capability of combining information
			CO4: Development of skills and use of knowledge in own personal or group project
40	IV/I	Digital Signal Processing	CO1: Understand the LTI system characteristics and Multirate signal processing
			CO2: Understand the inter-relationship between DFT and various transforms
			CO3: Design a digital filter for a given specification
			CO4: Understand the significance of various filter



			structures and effects of round off errors
41	IV/I	Hvdc Transmission	CO1: Compare EHV AC and HVDC system and to describe various types of DC links
			CO2: Analyze Graetz circuit for rectifier and inverter mode of operation
			CO3: Describe various methods for the control of HVDC systems and to perform power flow analysis in AC/DC systems
			CO4: Describe various protection methods for HVDC systems and classify Harmonics and design different types of filters
42	IV/I	Fundamentals Of Management For Engineers	CO1: The students understand the significance of Management in their Profession
			CO2: various Management Functions like Planning, Organizing, Staffing, Leading, Motivation
			CO3: Control aspects are learnt in this course.
			CO4: The students can explore the Management Practices in their domain area.
43	IV/I	Electrical & Electronics Design Lab	CO1: Get practical knowledge related to electrical
			CO2: Fabricate basic electrical circuit elements/networks
			CO3: Trouble shoot the electrical circuits
			CO4: Get hardware skills such as soldering, winding etc.
			CO1: Identify the drawbacks of speed control of



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44	IV/II	POWER SEMICONDUCTOR DRIVES	motor by conventional methods,
			CO2: Differentiate Phase controlled and chopper controlled DC drives speed-torque characteristics merits and demerits
			CO3: Understand Ac motor drive speed-torque characteristics using different control strategies its merits and demerits
			CO4: Describe Slip power recovery schemes
45	IV/II	NON-CONVENTIONAL SOURCES OF ENERGY	CO1: Identify renewable energy sources and their utilization. Understand the basic concepts of solar radiation and analyze the working of solar and thermal systems.
			CO2: Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, biogas and hydrogen
			CO3: Understand the concepts and applications of fuel cells, thermoelectric converter and MHD generator.
			CO4: Identify methods of energy storage for specific applications
46	IV/II	Electrical Distribution Systems	CO1: distinguish between transmission, and distribution line and design the feeders
			CO2: compute power loss and voltage drop of the feeders
			CO3: design protection of distribution systems
			CO4: understand the importance of voltage control and power factor improvement


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MECHANICAL ENGINEERING I and II Course Outcomes for the Academic Year 2021-2022

S.NO	YEAR/SEM	COURSE NAME	COURSE OUTCOMES
1	II/I	Metallurgy and Material science	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 non ferrous alloys
			CO4: Describe the concept of heat treatment of steels & strengthening mechanisms
			CO5: Explain the powder metallurgy process, types and manufacturing of composite materials
2	II/I	Mechanics Of Solids	CO1: Understand the concepts of stress and strain and evaluate
			CO2: Apply the concept of shear force and bending moment for simple structural problems
			CO3: Apply the concepts of principal stresses and strains, body subjected to direct stresses accompanied by shear stresses
			CO4: Evaluate bending stresses and shear stresses for simple structures
			CO5: Analyze thin cylinders subjected to various stresses
			CO6: Evaluate stresses in shafts.
3	II/I	Thermo-Dynamics	CO1: Understand and differentiate between different thermodynamic system 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 cycle.
			CO5: Understand and evaluate performance parameters.



			CO6: Develop the concept of power cycle with description and representation on p-v and T-S diagram
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4	II/I	Production Technology	CO1: Elaborate the fundamentals of various moulding casting techniques and furnaces.
			CO2: Identify the importance of permanent joining and principle behind different welding processes
			CO3: Explain the concepts of solid-state welding processes
			CO4: Understand the concepts of rolling and sheet metal operations in metal working.
			CO5: Elaborates the uniqueness of extrusion, forging and high energy rate forming processes in metal working.
			CO6: Develop process-maps for metal forming process using plasticity principles and identify the effect of process variable to manufacturing defect free products.
5	II/I	Machine Drawing Practice	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, centers, curved and tapered features.
			CO5: Title boxes, their size, location and details - common

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			abbreviations and their liberal usage.
			CO6: Types of Drawings – working drawings for machine parts.
6	II/I	Probability And Statistics & Complex Variable	CO1: Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
			CO2: analyze 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: Evaluate the integrals using Cauchy's integral formula and residue theorems.
			CO5: Solve the problems involving random variables.
7	II/I	PRODUCTION TECHNOLOGY LAB	CO1: Understanding the properties of moulding sands and pattern making. Fabricate joints using gas welding and arc welding
			CO2: Evaluate the quality of welded joints. Basic idea of press working tools and performs moulding studies on plastics.
			CO3: Design simple process plans for parts and products, understand how process conditions are set for optimization of production
			CO4: Understanding the measure a given manufactured part to evaluate its size, tolerances and surface finish
			CO5: Learn how various products are made using traditional, non-traditional, or Electronics manufacturing processes
8	II/I	MATERIAL SCIENCE & MECHANICS OF SOLIDS LAB	CO1: The Primary focus of the Metallurgy and Material science program is to provide undergraduates with a fundamental knowledge based associated materials properties, and their selection and application
			CO2: Upon graduation, students would have acquired and developed the necessary background and skills for successful careers in the materials-related industries.
			CO3: Furthermore, after completing the program, the student



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			should be well prepared for management positions in industry or continued education toward a graduate degree.
9	II/I	CONSTITUTION OF INDIA	CO1: Understand the meaning and importance of Constitution
			CO2: Scheme of the fundamental rights
			CO3: Parliamentary Form of Government in India – The constitution powers and status of the President of India, Amendment of the Constitutional Powers and Procedure
			CO4: The scheme of the Fundamental Duties and its legal status, The Directive Principles of State Policy – Its importance and implementation
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	Kinematics Of Machinery	CO1: Understand the various elements in mechanism and the inversions of commonly used mechanisms such as four bar, slider crank and double slider crank mechanisms
			CO2: Draw the velocity and acceleration polygons for a given configuration of a mechanism.
			CO3: Mechanical Engineering we come across number of mechanisms such as four bar/slider crank/double slider crank/straight line motion mechanism etc.
			CO4: Once we make a study considering for us also there it is called kinetics. The first course deals with mechanisms, their inversions straight line motion mechanisms steering mechanisms etc.
			CO5: Also study of cams/gears & gear trains & belts are also



			introduced.
			CO6: The main purpose is to give an idea about the relative motions obtained in all the above type of components used in mechanical Engineering.
12	II/II	Thermal Engineering – I	<p>CO1: the student should be able to evaluate the performance of IC engines and compressors under the given operating conditions</p> <p>CO2: Apply the laws of Thermodynamics to evaluate the performance of Refrigeration and air-conditioning cycles</p> <p>CO3: Understand the functionality of the major components of the IC Engines and effects of operating conditions on their performance</p> <p>CO4: The functionality of the major components of the IC engine</p> <p>CO5: evaluate the perform analysis of the major components and systems of IC engines, refrigeration cycles and their applications.</p>
13	II/II	Fluid mechanics And Hydraulic machines	<p>CO1: Able to explain the effect of fluid properties on a flow system.</p> <p>CO2: Able to identify type of fluid flow patterns and describe continuity equation.</p> <p>CO3: To analyze a variety of practical fluid flow and measuring devices and utilize Fluid Mechanics principles in design.</p> <p>CO4: To select and analyze an appropriate turbine with reference to given situation in power plants</p> <p>CO5: To estimate performance parameters of a given Centrifugal and Reciprocating pump.</p> <p>CO6: To estimate performance parameters of a given Centrifugal and Reciprocating pump.</p> <p>CO1: To identify various elements and their purpose in typical instruments, to identify various errors that would occur in instruments</p> <p>CO2: Analysis of errors so as to determine correction factors for each instrument.</p>



14	II/II	Instrumentation and Control systems	CO3: To understand static and dynamic characteristics of instrument and should be able to determine loading response time.
			CO4: For given range of displacement should be able to specify transducer, its accuracy and loading time of that transducer.
			CO5: Identifying properties used for evaluating the thermal systems.
			CO6: Identifying errors and their types that would occur in an instrument.
15	II/II	GENDER SENSITIZATION LAB	CO1: Understanding of important issues related to gender in contemporary India.
			CO2: Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
			CO3: Students will develop a sense of appreciation of women in all walks of life.
			CO4: Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.
16	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, identify and characterize diodes and various types of transistors
			CO1: Able to explain the effect of fluid properties on a flow system. Identify type of fluid flow patterns and describe continuity equation.
			CO2: To analyze a variety of practical fluid flow and measuring



17	II/II	FLUID MECHANICS AND HYDRAULIC MACHINES LAB	devices and utilize fluid mechanics principles in design.
			CO3: To select and analyze an appropriate turbine with reference to given situation in power plants
			CO4: To estimate performance parameters of a given Centrifugal and Reciprocating pump.
18	II/II	INSTRUMENTATION AND CONTROL SYSTEMS LAB	CO1: At the end of the course, the student will be able to Characterize and calibrate measuring devices. Identify and analyze errors in measurement.
			CO2: Analyze measured data using regression analysis. Calibration of Pressure Gauges, temperature, LVDT, capacitive transducer, Rota meter.
19	III/I	Dynamics Of Machinery	CO1: Apply the knowledge of the gyroscopic effect and evaluate the stability of Ship, Aero plane, Two wheeler and Four wheeler.
			CO2: Understand the concept of Equilibrium of a body subjected to static and dynamic forces
			CO3: Analyze the concept of fluctuation energy, inertia of connecting rod- inertia force in reciprocating engines
			CO4: Develop the ability to identify a problem and apply the fundamental concepts of transmission and concepts of friction
			CO5: Understand the significance of governors and balancing of masses in various machines where ever applicable
			CO6: Develop the ability to function on multi-disciplinary teams by having knowledge of vibrations
			CO1: The student acquires the knowledge about the principles of design, material selection, component behavior subjected to loads, design on the basis of strength & rigidity, and analyze the stresses & strains induced in a machine element
			CO2: Understands the concepts of principal stresses, Failure theories and design of components subjected to various static



20	III/I	Design Of Machine Members-I	loads
			CO3: Student can able to design the machine components subjected to various varying & reversal loadings considering stress concentration in machine members
			CO4: Students will able to design the joints such as Bolted, Welded and Riveted Joints used in industrial Applications
			CO5: Students can design various keys used in Power Transmission Applications and also they can able to design various Cotter and Knuckle Joints
			CO6: Students can able to design the shafts and their couplings used in Industrial Power Transmission Applications
21	III/I	Business economics and Financial analysis	CO1: Understand the elasticity of the demand of the product, different types, and measurement of elasticity of demand and factors influencing on elasticity of demand.
			CO2: Recognize the Production function, features of Iso-Quants and Iso-Costs, different types of internal economies, external economies and law of returns with appropriate examples.
			CO3: Illustrate the features, merits and demerits of different forms of business organizations existing in the modern business.
			CO4: Enumerate the concept of capital budgeting and allocations of the resources through capital budgeting methods and compute simple problems for project management.
			CO5: Evaluate different types of financial ratios for knowing liquidity and profitability positions of business concern.
22	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: Estimate machining times for machining operations on machine tools
23	III/I	Thermal Engineering - II	CO1: Develop state – space diagrams based on the schematic diagrams of process flow of steam and gas turbine plants
			CO2: Apply the laws of Thermodynamics to analyze thermodynamic cycles
			CO3: Differentiate between vapour power cycles and gas power cycles
			CO4: Infer from property charts and tables and to apply the data for the evaluation of performance parameters of the steam and gas turbine plants
			CO5: Understand the functionality of major components of steam and gas turbine plants and to do the analysis of these components
24	III/I	Operations Research	CO1: Identify and develop operational research models from the verbal description of the real system.
			CO2: Understand the mathematical tools that are needed to solve optimization problems.
			CO3: Use mathematical software to solve the proposed models.
			CO4: Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.
			CO5: Linear programming: solving methods, duality, and sensitivity analysis.
25	III/I	THERMAL ENGINEERING LAB	CO 1: Identify the various fuel characterizations through experimental testing
			CO 2: Analyze the performance characteristics of an internal combustion engines
			CO 3: Evaluate the performance parameters of refrigeration systems



			CO4: Analyze the air compressor characteristics
26	III/I	METROLOGY AND MACHINE TOOLS LAB	CO1: Hands on experience on lathe machine to perform turning, facing, threading operations.
			CO 2: Practical exposure on flat surface machining, milling and grinding operations.
			CO 3: Skill development in drilling and threading operations
			CO4: Linear and angular measurements exposure.
27	III/I	KINEMATICS AND DYNAMICS LAB	CO1: Explain the various types of gear trains and simple mechanisms.
			CO2: Utilize the principles learnt in kinematics and dynamics of machinery
			CO3 : Understand the use of certain measuring devices in dynamic testing
			CO4: Compute the mass moment inertia of rotating element. C
28	III/I	INTELLECTUAL PROPERTY RIGHTS	CO1: Recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights.
			CO2: students to understand the statutory provisions of different forms of IPRs in simple forms.
			CO3: Learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design
			CO4: students to keep their IP rights alive.
29	III/II	Design Of Machine Members-II	CO1: Ability to use Standard Design Data Book and knowledge about journal bearing design
			CO2: Estimation of life of rolling element bearings and their selection for given service conditions
			CO3: Knowledge of design of Internal Combustion Engine Components
			CO4: Student can able to design different belt drives, pulleys & various springs used in industrial and Automobile Applications
			CO5: Ability to design Spur gears used in Industrial &



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

			Automotive Applications
			CO6: Knowledge of design of Helical gears used in Industrial & Automotive Applications
30	III/II	Heat Transfer	CO1: Understand the basic modes of heat transfer
			CO2: Compute one dimensional steady state heat transfer with and without heat generation
			CO3: Understand and analyze heat transfer through extended surfaces
			CO4: Interpret and analyze forced and free convective heat transfer
			CO5: Understand the principles of boiling, condensation and radiation heat transfer
			CO6: Design of heat exchangers using LMTD and NTU methods
31	III/II	CAD & CAM	CO1: Understand geometric transformation techniques in CAD
			CO2: Develop mathematical models to represent curves and surfaces. Model engineering components using solid modeling techniques.
			CO3: Develop programs for CNC to manufacture industrial components
			CO4: To understand the application of computers in various aspects of Manufacturing.
			CO5: Design, Proper planning, Manufacturing cost, Layout & Material Handling system.
32	III/II	Unconventional Machining Processes	CO1: Understand the basic techniques of Unconventional Machining processes modeling
			CO2: To teach the modeling technique for machining processes
			CO3: To teach the mechanics and thermal issues associated with chip formation
			CO4: To teach the effects of tool geometry on machining force components and surface finish



			<p>CO5: To teach the machining surface finish and material removal rate</p> <p>CO6: Estimate the material removal rate and cutting force, in an industrially useful manner, for Unconventional Machining processes.</p>
33	III/II	Finite Element Methods	<p>CO1: At the end of the course, the student will be able to, Apply finite element method to solve problems in solid mechanics, fluid mechanics and heat transfer.</p> <p>CO2: Formulate and solve problems in one dimensional structures including trusses, beams and frames.</p> <p>CO3: Formulate FE characteristic equations for two dimensional elements and analyze plain stress, plain strain, axisymmetric and plate bending problems. ANSYS, ABAQUS, NASTRAN, etc.</p> <p>CO4: Implementation of material model in finite element method and applications</p> <p>CO5: Importance of interfaces and joints on the behavior of engineering systems</p>
34	III/II	ENVIRONMENTAL SCIENCE	<p>CO1: Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development</p>
35	III/II	HEAT TRANSFER LAB	<p>CO1: Perform steady state conduction experiments to estimate thermal conductivity of different materials</p> <p>CO2: Perform transient heat conduction experiment</p> <p>CO3: Estimate heat transfer coefficients in forced convection, free convection, condensation and correlate with theoretical values</p> <p>CO4: Obtain variation of temperature along the length of the pin fin under forced and free convection</p> <p>CO5: Perform radiation experiments: Determine surface emissivity of a test plate and Stefan- Boltzmann's constant and compare with theoretical value</p>



36	III/II	CAD & CAM LAB	CO1: Define and describe FMS, differentiate between cellular manufacturing and FMS, FMS layouts. describe Planning and preparation guidelines for FMS
			CO2: Define and describe Just in time manufacturing and its benefits, describe group technology classification and coding and its benefits
			CO3: Design FMS using bottleneck and extended bottle neck models, describe construction and operation of turning and machining centre, coordinate measuring machine.
			CO4: Describe Tool management and specify cutting tool controls, work holding and work changing equipment. Describe General fixturing design of manual and automated transfer lines.
			CO5: Describe Computer hardware and software, PLC's, communication networks in FMS implementation
37	III/II	ADVANCED COMMUNICATIONS SKILLS LAB	CO1: To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3: To prepare all the students for their placements
38	IV/I	Refrigeration and Air conditioning	CO1: Analyze the reversed Carnot cycle and vapor compression refrigeration cycle (VCR).
			CO2: Select the air-refrigeration systems for aircraft, and vapor absorption refrigeration system for rural and remote areas and select environmental friendly refrigerants considering the international standards.
			CO3: Identify the Psychometric processes for different applications and design the parameters of air-conditioning system as per standards.
			CO4: Understand the human comfort, ASHRAE chart and concept of effective temperature



			CO5: Estimate cooling load and heating load considering human comfort and optimize the air conditioning system as per requirements.
39	IV/I	Power Plant Engineering	CO1: Able to get the basics of Power Plants.
			CO2: Able to get the idea about the power generation by renewable and non-renewable energy resources.
			CO3: Able to know about the different types of cycles and natural resources used in power plants and their applications.
			CO4: Evaluate the performance of condensers and steam turbines
			CO5: Evaluate the performance of gas turbines
40	IV/I	ADDITIVE MANUFACTURING	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.
41	IV/I	AUTOMATION IN MANUFACTURING	CO1: Describe the basic concepts of automation and automated flow lines
			CO2: Analyze automated flow lines and line balancing methods.
			CO3: Explain the importance of material handling, automated inspection systems in automated assembly.



42	IV/I	Mems	CO1: Students will be able to understand working principles of currently available micro sensors, actuators, and motors, valves, pumps, and fluidics used in Microsystems.
			CO2: Students will be able to apply scaling laws that are used extensively in the conceptual design of micro devices and systems. Students will be able to differentiate between the positive and negative consequences of scaling down certain physical quantities that are pertinent to Microsystems.
			CO3: Students will be able to use materials for common micro components and devices.
			CO4: Students will be able to choose a micromachining technique, such as bulk micromachining and surface micromachining for a specific MEMS fabrication process.
			CO5: Students will be able to consider recent advancements in the field of MEMS and devices
			CO6: Students will be able communicate their results and findings orally via formal presentations and in writing through reports.
43	IV/II	COMPOSITE MATERIALS	CO1: Knowledge of the crystal structures of a wide range of ceramic materials and glasses
			CO2: Able to explain how common fibers are produced and how the properties of the fibers are related to the internal structure
			CO3: Able to select matrices for composite materials in different applications.
			CO4: Able to describe key processing methods for fabricating composites.
44	IV/II	PRODUCTION AND OPERATIONS MANAGEMENT	CO1: Able to execute operations management functions
			CO2: Able to carry out value analysis
			CO3: Able to carry out aggregate planning and implement MRP Or JIT
			CO4: Able to schedule the jobs so as to complete them in minimum make span time



45	IV/II	ENVIRONMENTAL IMPACT ASSESSMENT	CO1: Identify the environmental attributes to be considered for the EIA study
			CO2: Formulate objectives of the EIA studies
			CO3: Identify the methodology to prepare rapid EIA
			CO4: Prepare EIA reports and environmental management plans

46	IV/I	Fluid Power System	CO1: Understand the Properties of fluids, Fluids for hydraulic systems,
			CO2: governing laws. distribution of fluid power, Design and analysis of typical hydraulic circuits
			CO3: Know accessories used in fluid power system, Filtration systems
			CO4: maintenance of system.
			CO5: Under Stand the maintenance of the pneumatic system.
47	IV/I	Utilization Of Electrical Energy	CO1: Understand basic principles of electric heating and welding.
			CO2: Determine the lighting requirements for flood lighting, household and industrial needs.
			CO3: Calculate heat developed in induction furnace.
			CO4: Evaluate speed time curves for traction
			CO5: To understand the concepts of electric drives and their application to electrical traction systems.
48	IV/II	Basic Power Plant Engineering	CO1: To understand Basic Rankine cycle and its modifications, layout of modern coal power plant, super critical boilers
			CO2: To understand FBC boilers, turbines, condensers, steam and heating rates, subsystems of thermal power plants, fuel and ash handling, draught system, feed water treatment, binary cycles and cogeneration systems
			CO3: Explain Brayton cycle analysis and optimization, components of gas turbine power plants, combined cycle power plants, Integrated Gasifier based Combined Cycle (IGCC) systems.
			CO4: Layout and subsystems of nuclear power plants, Boiling Water



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

		<p>Reactor (BWR), Pressurized Water Reactor (PWR), CANDU Reactor, Pressurized Heavy Water Reactor (PHWR), Fast Breeder Reactors (FBR), gas cooled and liquid metal cooled reactors, safety measures for nuclear power plants.</p>
		<p>COS: To understand Power tariffs, load distribution parameters, load curve, capital and operating cost of different power plants, pollution control technologies including waste disposal options for coal and nuclear plants.</p>


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KSHATRIYA COLLEGE OF ENGINEERING

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ECE Engineering I & II Sem Course Outcomes for The Academic Year 2021-2022

ECE Engineering I & II Sem Course Outcomes for The Academic Year 2021-2022

S.No:	Year/Sem	Course Name	Course Out Comes
1	II/I	ELECTRONIC DEVICES AND CIRCUITS	CO1: Know the characteristics of various components.
			CO2: Understand the utilization of components.
			CO3: Understand the biasing techniques
			CO4: Design and analyse small signal amplifier circuits.
2	II/I	NETWORK ANALYSIS AND TRANSMISSION LINES	CO1: Gain the knowledge on basic RLC circuits behaviour.
			CO2: Analyse the Steady state and transient analysis of RLC Circuits
			CO3: Know the characteristics of two port network parameters.
			CO4: Analyse the transmission line parameters and configurations.
3	II/I	DIGITAL SYSTEM DESIGN	CO1: Understand the numerical information in different forms and Boolean Algebra theorems
			CO2: Postulates of Boolean algebra and to minimize combinational functions
			CO3: Design and analyse combinational and sequential circuits
			CO4: Known about the logic families and realization of logic gates.
			CO1: Differentiate various signal functions.
			CO2: Represent any arbitrary signal in time and

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53

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4	II/I	SIGNALS AND SYSTEMS	<p>frequency domain.</p> <p>CO3: Understand the characteristics of linear time invariant systems.</p> <p>CO4: Analyse the signals with different transform technique</p>
5	II/I	PROBABILITY THEORY AND STOCHASTIC PROCESSES	<p>CO1: Understand the concepts of Random Process and its Characteristics.</p> <p>CO2: Understand the response of linear time Invariant system for a Random Processes.</p> <p>CO3: Determine the Spectral and temporal characteristics of Random Signals.</p> <p>CO4: Understand the concepts of Noise in Communication systems.</p>
6	II/I	ELECTRONIC DEVICES AND CIRCUITS LAB	<p>CO1: Verify the working of diodes, transistors, Amplifiers and their applications</p> <p>CO2: Understand the h-parameters of transistor in CB, CE, CC configurations , Switching Characteristics of Transistors.</p> <p>CO3: Analyse the Clippers & Clampers at different reference voltages</p> <p>CO4: Learn to design different types of filters and apply the same to oscillators and amplifiers, SCR Characteristics</p>
7	II/I	DIGITAL SYSTEM DESIGN LAB	<p>CO1: Realization of Boolean Expressions using Gates</p> <p>CO2: Understand the Different types of gates , and implement logic gates using universal gates</p> <p>CO3: Understand the Adder subtractor Calculation using IC's</p> <p>CO4: Learn Mux , synchronous & Asynchronous counter using flip-flops</p>



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

8	II/I	BASIC SIMULATION LAB	CO1: Acquainted with MATLAB commands, functions and programming
			CO2: Generate various signals and sequences in MATLAB and perform operations on them.
			CO3: Verify the properties of a given Continuous/Discrete System and Sampling theorem.
			CO4: Determine the Laplace and Fourier Transform of the given signal.
9	II/I	CONSTITUTION OF INDIA	CO1: Understand the meaning and importance of Constitution
			CO2: Scheme of the fundamental rights
			CO3: Parliamentary Form of Government in India – The constitution powers and status of the President of India, Amendment of the Constitutional Powers and Procedure
			CO4: The scheme of the Fundamental Duties and its legal status, The Directive Principles of State Policy – Its importance and implementation
10	II/II	LAPLACE TRANSFORMS, NUMERICAL METHODS AND COMPLEX VARIABLES	CO1: Use the Laplace transforms techniques for solving ODE's
			CO2: Find the root of a given equation.
			CO3: Estimate the value for the given data using interpolation
			CO4: Find the numerical solutions for a given ODE's
			CO5: Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
			CO6: Taylor's and Laurent's series expansions of complex function
			CO1: Get the knowledge of Basic Laws, Concepts and proofs related to Electrostatic Fields and



KSHATRIYA COLLEGE OF ENGINEERING

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11	II/II	ELECTROMAGNETIC FIELDS AND WAVES	Magnetostatic Fields.
			CO2: Distinguish between the static and time-varying fields, establish the corresponding sets of Maxwell's Equations and Boundary Conditions.
			CO3: Analyze the Wave Equations for good conductors, good dielectrics and evaluate the UPW Characteristics for several practical media of interest.
			CO4: To analyze completely the rectangular waveguides, their mode characteristics, and design waveguides for solving practical problems.
12	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 and design the various Pulse Modulation Techniques.
			CO4: Understand the concepts of Digital Modulation Techniques and Baseband transmission.
13	II/II	LINEAR IC APPLICATIONS	CO1: A thorough understanding of operational amplifiers with linear integrated circuits
			CO2: Attain the knowledge of functional diagrams and applications of IC 555 and IC 565
			CO3: Acquire the knowledge about the Data converters.
			CO1: Learn the concepts of high frequency analysis of transistors.
			CO2: To give understanding of various types of amplifier circuits such as small signal, cascaded, large signal and tuned amplifiers.

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56

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(Affiliated to JNTU Hyderabad & Approved by AICTE)

14	II/II	ELECTRONIC CIRCUIT ANALYSIS	CO3: To familiarize the Concept of feedback in amplifiers so as to differentiate between negative and positive feedback
			CO4: To construct various multivibrators using transistors and sweep circuits.
15	II/II	ANALOG AND DIGITAL COMMUNICATIONS LAB	CO1: Demonstrate generation and detection of analog and digital modulation techniques.
			CO2: Explain sampling, PCM, delta modulation, adaptive delta modulation.
			CO3: Compare the different analog and digital modulation techniques.
			CO4: Distinguish various line coding schemes used for digital data transmission.
16	II/II	IC APPLICATIONS LAB	CO1: Understanding of operational amplifier(741)
			CO2: Design various combinational circuits using various Digital Integrated IC's.
			CO3: Know the differences between Linear and Digital Integrated IC's.
			CO4: understand the IC 565-PLL Applications and Three terminal voltage regulators-7805, 7809, 7912
17	II/II	ELECTRONIC CIRCUIT ANALYSIS LAB	CO1: Comprehend the fundamentals of multistage amplifiers, feedback, power amplifiers and oscillator circuits
			CO2: Acquaint with the design and simulate the RC coupled and Cascade amplifier circuits
			CO3: Discriminate the design and simulate various oscillator circuits
			CO4: Create the design and simulate the cascade, class A power amplifier circuits, and single tuned voltage amplifier circuits
			CO1: Understanding of important issues related to



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

18	II/II	GENDER SENSITIZATION LAB	gender in contemporary India.
			CO2: Sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
			CO3: Students will develop a sense of appreciation of women in all walks of life.
			CO4: Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.
19	III/I	MICROPROCESSORS AND MICROCONTROLLERS	CO1: Understands the internal architecture, organization and assembly language programming of 8086 processors.
			CO2: Understands the internal architecture, organization and assembly language programming of 8051/controllers.
			CO3: Understands the interfacing techniques to 8086 and 8051 based systems.
			CO4: Understands the internal architecture of ARM processors and basic concepts of advanced ARM processors.
20	III/I	DATA COMMUNICATIONS AND NETWORKS	CO1: Know the Categories and functions of various Data communication Networks
			CO2: Design and analyze various error detection techniques.
			CO3: Demonstrate the mechanism of routing the data in network layer
			CO4: Know the significance of various Flow control and Congestion control Mechanisms, Functioning of various Application layer Protocols



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

21	III/I	CONTROL SYSTEMS	CO1: Understand the modeling of linear-time-invariant systems using transfer function.
			CO2: Understand the state space representations.
			CO3: Understand the concept of stability and its assessment for linear-time invariant systems.
			CO4: Design simple feedback controllers.
22	III/I	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business.
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.
			CO4: To learn the basic business types, impact of the economy on Business and Firms specifically
23	III/I	COMPUTER ORGANIZATION & OPERATING SYSTEMS	CO1: Able to visualize the organization of different blocks in a computer.
			CO2: Able to use micro-level operations to control different units in a computer.
			CO3: Able to use Operating systems in a computer.
24	III/I	MICROPROCESSORS AND MICROCONTROLLERS LAB	CO1: Understand and apply the fundamentals of assembly level programming of microprocessors and microcontroller
			CO2: Work with standard microprocessor real time interfaces including GPIO, serial ports, digital-to-analog converters and analog-to-digital converters; Troubleshoot interactions between software and hardware
			CO3: Analyze abstract problems and apply a combination of hardware and software to address the problem;

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59

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(Affiliated to JNTU Hyderabad & Approved by AICTE)

			CO4: Use standard test and measurement equipment to evaluate digital interfaces.
25	III/I	DATA COMMUNICATIONS AND NETWORKS LAB	CO1: Understand the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers.
			CO2: Understand the basic concepts of application layer protocol design; including client/server models, peer to peer models, and network naming.
			CO3: In depth understanding of transport layer concepts and protocol design; including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control.
26	III/I	ADVANCED COMMUNICATION SKILLS LAB	CO1: Student will improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3: Students will prepare all for their placements.
			CO4: Course should be a laboratory course to enable students to use 'good' English and Gathering ideas and information to organize ideas relevantly and coherently.
			CO1: Recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights.
			CO2: students to understand the statutory provisions of different forms of IPRs in simple forms.
			CO3: Learn the procedure of obtaining Patents,



KSHATRIYA COLLEGE OF ENGINEERING

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27	III/I	INTELLECTUAL PROPERTY RIGHTS	Copyrights, Trade Marks & Industrial Design CO4: students to keep their IP rights alive.
28	III/II	ANTENNAS AND PROPAGATION	CO1: Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of VHF, UHF and Microwave antennas and also antenna arrays. CO2: Specify the requirements for microwave measurements and arrange a setup to carry out the antenna far zone pattern and gain measurements in the laboratory. CO3: Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved.
29	III/II	DIGITAL SIGNAL PROCESSING	CO1: Understand the LTI system characteristics and Multirate signal processing. CO2: Understand the inter-relationship between DFT and various transforms. CO3: Design a digital filter for a given specification CO4: Understand the significance of various filter structures and effects of round off errors.
30	III/II	VLSI DESIGN	CO1: Acquire qualitative knowledge about the fabrication process of integrated circuits using MOS transistors. CO2: Draw the layout of any logic circuit which helps to understand and estimate parasitic effect of any logic circuit CO3: Design building blocks of data path systems, memories and simple logic circuits using PLA, PAL, FPGA and CPLD. CO4: Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

			system.
31	III/II	EMBEDDED SYSTEM DESIGN	CO1: To understand the selection procedure of Processors in the embedded domain
			CO2: Design Procedure for Embedded Firmware.
			CO3: To visualize the role of Real time Operating Systems in Embedded Systems
			CO4: To evaluate the Correlation between task synchronization and latency issues
32	III/II	FUNDAMENTALS OF MANAGEMENT FOR ENGINEERS	CO1: The students understand the significance of Management in their Profession. The various Management Functions like Planning, Organizing, Staffing, Leading, Motivation and Control aspects are learnt in this course.
			CO2: The students can explore the Management Practices in their domain area.
33	III/II	DIGITAL SIGNAL PROCESSING LAB	CO1: Experiment concepts of DSP and its applications using MATLAB Software
			CO2: To understand about the basic signal generation
			CO3: To learn Fourier Transform Concepts
			CO4: To design FIR filters, IIR filters
34	III/II	e - CAD LAB	CO1: Design entry and simulation of combinational & sequential circuits and functional verification
			CO2: Synthesis, p&r and post p&r simulation for combinational and sequential circuits.
			CO3: Implementation of the combinational & sequential circuits on FPGA hardware
			CO4: Write Verilog and VHDL code for different circuits and understanding design styles
35	III/II	SCRIPTING LANGUAGES LAB	CO1: Ability to understand the differences between Scripting languages and programming languages

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62

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			CO2: Able to gain some fluency programming in Ruby, Perl, TCL
36	III/II	ENVIRONMENTAL SCIENCE	CO1: Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
37	IV/I	MICROWAVE AND OPTICAL COMMUNICATIONS (PC)	CO1: Known power generation at microwave frequencies and derive the performance characteristics.
			CO2: realize the need for solid state microwave sources and understand the principles of solid state devices.
			CO3: distinguish between the different types of waveguide and ferrite components, and select proper components for engineering applications
			CO4: understand the utility of S-parameters in microwave component design and learn the measurement procedure of various microwave parameters. Understand the mechanism of light propagation through Optical Fibres.
38	IV/I	SCRIPTING LANGUAGES	CO1: Known about basics of Linux and Linux Networking
			CO2: Use Linux environment and write programs for automation
			CO3: Understand the concepts of Scripting languages
			CO4: Create and run scripts using PERL/TCL/Python
			CO1: Gain knowledge of fundamentals of DBMS, database design and normal forms
			CO2: Master the basics of SQL for retrieval and



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

39	IV/I	DATABASE MANAGEMENT SYSTEM	management of data
			CO3: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and access techniques
40	IV/I	PRINCIPLES OF ENTREPRENEURSHIP	CO1: Knowledge of entrepreneurship definitions and different views of entrepreneurship.
			CO2: knowledge of approaches for generating new business ideas.
			CO3: knowledge of methodology for business model formation.
			CO4: knowledge of the purpose and problems of entrepreneurial development.
41	IV/I	PROFESSIONAL PRACTICE, LAW AND ETHICS	CO1: The students will understand the importance of professional practice, Law and Ethics in their personal lives and professional careers.
			CO2: The students will learn the rights and responsibilities as an employee, team member and a global citizen
42	IV/I	MICROWAVE AND OPTICAL COMMUNICATIONS LAB	CO1: Verify characteristics of Reflex Klystron.
			CO2: Analyze various parameters of Waveguide Components.
			CO3: Estimate the power measurements of RF Components such as directional Couplers.
			CO4: Demonstrate characteristics of various optical sources, Measure data Rate, Numerical Aperture and Losses in Optical Link.
			CO1: Analyze and compare various architectures of Wireless Sensor Networks
			CO2: Understand Design issues and challenges in wireless sensor networks



KSHATRIYA COLLEGE OF ENGINEERING

(Affiliated to JNTU Hyderabad & Approved by AICTE)

43	IV/II	WIRELESS SENSOR NETWORKS	CO3: Analyze and compare various data gathering and data dissemination methods.
			CO4: Design, Simulate and Compare the performance of various routing and MAC protocol
44	IV/II	LOW POWER VLSI DESIGN	CO1: Understand the need of Low power circuit design.
			CO2: Attain the knowledge of architectural approaches.
			CO3: Analyze and design Low-Voltage Low-Power combinational circuits.
			CO4: Known the design of Low-Voltage Low-Power Memories
45	IV/II	NON-CONVENTIONAL ENERGY SOURCES	CO1: Discuss non-conventional sources of energy and explain the working of different solar energy applications
			CO2: Discuss wind energy conversion systems and explain sources of geothermal energy, Describe different biogas plants and working of different gasifiers
			CO3: Explain the working principle of different fuel cells and ocean thermal energy conversion systems
			CO4: Describe the working of magneto hydro dynamic power systems and principles of energy conservation


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Computer Science and Engineering I & II Sem Course Outcomes For The Academic Year 2021-2022

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, tries, heaps, graphs, and AVL-trees.
			CO5: Explain the powder metallurgy process, types and manufacturing of composite materials
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 computerprocessor including memory.
			CO4: Design a pipeline for consistent execution of instructions with minimum hazards.
			CO5: Recognize and manipulate representations of numbers stored in digital computers.
3	II/I	OBJECT ORIENTED PROGRAMMING	CO1: Able to develop programs with reusability
			CO2: Develop programs for file handling
			CO3: Handle exceptions in programming
			CO4: Develop applications for a range of problems

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56

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		USING C++	using object-oriented programming techniques
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
			CO6: Know about the logic families and realization of logic gates.
5	II/I	COMPUTER ORIENTED STATISTICAL METHODS	CO1: Apply the concepts of probability and distributions to some case studies
			CO2: Correlate the material of one unit to the material in other units
			CO3: Resolve the potential misconceptions and hazards in each topic of study
			CO4: To measure experimental result based on hypothesis using chi square techniques
6	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: Postulates of Boolean algebra and to minimize combinational functions
			CO5: Design and analyze combinational and sequential circuits
			CO1: Ability to develop C programs for computing and real-life applications using basic elements like



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7	II/I	Data Structure Lab	control statements, arrays, functions, pointers and strings, and data structures like stacks, queues and linked lists.
			CO2: Ability to Implement searching and sorting algorithms
8	II/I	C++ LAB	CO1: Ability to develop applications for a range of problems using object-oriented programming techniques
9	II/I	Gender Sensitization Lab	CO1: To develop students' sensibility with regard to issues of gender in contemporary India.
			CO2: To provide a critical perspective on the socialization of men and women.
			CO3: To introduce students to information about some key biological aspects of genders.
			CO4: To expose the students to debates on the politics and economics of work.
			CO5: To help students reflect critically on gender violence
			CO6: To expose students to more egalitarian interactions between men and women
10	II/I	IT WORKSHOP LAB	CO1: Ability to identify the peripherals of a computer and installation of system software.
			CO2: Ability to disassemble and assemble the PC back to working condition
			CO3: Evaluate the Local Area Network and access the Internet.
			CO4: Apply the ideas in web browsers, email, newsgroups and discussion forums. Analyze and create power point presentation
			CO1: Ability to understand and construct precise mathematical proofs
			CO2: Ability to use logic and set theory to formulate

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68

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11	II/II	DISCRETE MATHEMATICS	precise statements
			CO3: Ability to analyze and solve counting problems on finite and discrete structures
			CO4: Ability to describe and manipulate sequences
			CO5: Ability to apply graph theory in solving computing problems
12	II/II	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
			CO5: Understanding file system structure and directory structure.
13	II/II	BUSINESS ECONOMICS AND FINANCIAL ANALYSIS	CO1: The students will understand the various Forms of Business and the impact of economic variables on the Business
			CO2: The Demand, Supply, Production, Cost, Market Structure, Pricing aspects are learnt.
			CO3: The Students can study the firm's financial position by analysing the Financial Statements of a Company.
14	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: Be acquainted with the basics of transaction processing and concurrency control.
			CO4: Familiarity with database storage structures and

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69

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			access techniques
15	II/II	JAVA PROGRAMMING	CO1: Able to solve real world problems using OOP techniques
			CO2: Able to understand the use of abstract classes.
			CO3: Able to solve problems using java collection framework and I/o classes.
			CO4: Able to develop multithreaded applications with synchronization.
			CO5: Able to develop applets for web applications.
			CO6: Able to design GUI based applications
16	II/II	OS LAB	CO1: Simulate and implement operating system concepts
			CO2: Able to implement C programs using Unix system calls
17	II/II	DBMS LAB	CO1: Design database schema for a given application and apply normalization
			CO2: Acquire skills in using SQL commands for data definition and data manipulation.
			CO3: Develop solutions for database applications using procedures, cursors and triggers
18	II/II	JAVA LAB	CO1: Able to write programs for solving real world problems using java collection frame work
			CO2: Able to write programs using abstract classes.
			CO3: Able to write multithreaded programs
			CO4: Able to write GUI programs using swing controls in Java.
			CO1: Understand the meaning and importance of Constitution



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19	II/I	CONSTITUTION OF INDIA	CO2: Scheme of the fundamental rights
			CO3: Parliamentary Form of Government in India – The constitution powers and status of the President of India, Amendment of the Constitutional Powers and Procedure
			CO4: The scheme of the Fundamental Duties and its legal status. The Directive Principles of State Policy – Its importance and implementation
20	III/I	Formal languages & Automate 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.
21	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: Identify and apply appropriate software architectures and patterns to carry out high level design of a system and be able to critically compare alternative choices.
			CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report
			CO1: Gain the knowledge of the basic computer network technology
			CO2: Gain the knowledge of the functions of each



22	III/I	COMPUTER NETWORKS	layer in the OSI and TCP/IP reference model
			CO3: Obtain the skills of sub netting and routing mechanisms
			CO4: Familiarity with the essential protocols of computer networks, and how they can be applied in network design and implementation.
23	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
24	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 of programming structures with efficiently using oops, concurrency management and event handling
25	III/I	SOFTWARE ENGINEERING LAB	CO1: Ability to translate end-user requirements into system and software requirements
			CO2: Ability to generate a high-level design of the system from the software requirements
			CO3: Will have experience and/or awareness of testing problems and will be able to develop a simple testing report



26	III/I	CN&WT LAB	CO1: Implement data link layer framing methods
			CO2: Analyze error detection and error correction codes
			CO3: Implement and analyze routing and congestion issues in network design.
			CO4: Implement Encoding and Decoding techniques used in presentation layer
			CO5: To be able to work with different network tools
27	III/I	ADVANCED OPERATING SYSTEMS	CO1: Understand the design approaches of advanced operating systems
			CO2: Analyze the design issues of distributed operating systems.
			CO3: Evaluate design issues of multi processor operating systems.
			CO4: Identify the requirements Distributed File System and Distributed Shared Memory.
			CO5: Formulate the solutions to schedule the real time applications.
28	III/I	ADVANCED COMMUNICATION SKILLS LAB	CO1: Student will improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
			CO2: Further, they would be required to communicate their ideas relevantly and coherently in writing.
			CO3: Students will prepare all for their placements.
			CO4: Course should be a laboratory course to enable students to use 'good' English and Gathering ideas and information to organize ideas relevantly and coherently.



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29	III/I	INTELLECTUAL PROPERTY RIGHTS	CO1: Recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights.
			CO2: students to understand the statutory provisions of different forms of IPRs in simple forms.
			CO3: Learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design
			CO4: students to keep their IP rights alive.
30	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.
31	III/II	COMPILER DESIGN	CO1: Demonstrate the ability to design a compiler given a set of language features.
			CO2: Demonstrate the the knowledge of patterns, tokens & regular expressions for lexical analysis.
			CO3: Acquire skills in using lex tool & yacc tool for developing a scanner and parser.
			CO4: Design and implement LL and LR parsers
			CO5: Design algorithms to do code optimization in order to improve the performance of a program in terms of space and time complexity
			CO6: Design algorithms to generate machine code.
			CO1: Analyze algorithms and improve the efficiency of algorithm for the divide and conquer method.
			CO2: Ability to analyze the performance of algorithms



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32	III/II	DESIGN AND ANALYSIS OF ALGORITHMS	CO3: Ability to choose appropriate data structures and algorithm design methods for a specified application
			CO4: Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs.
33	III/II	MOBILE APPLICATION DEVELOPMENT	CO1: Student understands the working of Android OS Practically
			CO2: Student will be able to develop Android user interfaces
			CO3: Student will be able to develop, deploy and maintain the Android Applications.
34	III/II	FUNDAMENTALS OF INTERNET OF THINGS	CO1: Known basic protocols in sensor networks.
			CO2: Program and configure Arduino boards for various designs.
			CO3: Python programming and interfacing for Raspberry Pi.
			CO4: Design IoT applications in different domains.
35	III/II	MACHINE LEARNING LAB	CO1: understand complexity of Machine Learning algorithms and their limitations;
			CO2: understand modern notions in data analysis-oriented computing;
			CO3: be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;
			CO4: Be capable of performing experiments in Machine Learning using real-world data.
			CO1: Design and develop interactive and dynamic web applications using HTML, CSS, JavaScript and XML



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36	III/II	COMPILER DESIGN LAB	CO2: Apply client-server principles to develop scalable and enterprise web applications.
			CO3: Ability to design, develop, and implement a compiler for any language.
			CO4: Able to use lex and yacc tools for developing a scanner and a parser.
			CO5: Able to design and implement LL and LR parsers.
37	III/II	ENVIRONMENTAL SCIENCE	CO1: : Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development
38	III/II	MOBILE APPLICATION DEVELOPMENT LAB	CO1: Student understands the working of Android OS Practically
			CO2: Student will be able to develop user interfaces.
			CO3: Student will be able to develop, deploy and maintain the Android Applications
39	IV/I	CRYPTOGRAPHY AND NETWORK SECURITY	CO1: Student will be able to understand basic cryptographic algorithms, message and web authentication and security issues.
			CO2: Ability to identify information system requirements for both of them such as client and server.
			CO3: Ability to understand the current legal issues towards information security.
			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.



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40	IV/I	DATA MINING	CO3: Extract interesting patterns from large amounts of data.
			CO4: Discover the role played by data mining in various fields
			CO5: Choose and employ suitable data mining algorithms to build analytical applications
			CO6: Evaluate the accuracy of supervised and unsupervised models and algorithms
41	IV-1	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.
42	IV-1	ADVANCED ALGORITHMS	CO1: Ability to analyze the performance of algorithms
			CO2: Ability to choose appropriate data structures and algorithm design methods for a specified application
			CO3: Ability to understand how the choice of data structures and the algorithm design methods impact the performance of programs
43	IV-1	PRINCIPLES OF ENTREPRENEURSHIP	CO1: Ability to solve professional problems by using scientific methods and procedures,
			CO2: Coherent mastering of basic knowledge, acquired mostly in other compulsory courses, and combining of knowledge from different areas and use of knowledge in business environment,
			CO3: Capability of search of new information in the area of entrepreneurship in literature and practice and capability of combining information,
			CO4: Development of skills and use of knowledge in own personal or group project.



44	IV-I	CRYPTOGRAPHY AND NETWORK SECURITY LAB	CO1: Analyze and design classical encryption techniques and block ciphers.
			CO2: Understand and analyze data encryption standard. Understand and analyze public-key cryptography, RSA and other public-key cryptosystems, such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc. .
			CO3: Understand key management and distribution schemes and design User Authentication, Protocols. Analyze and design hash and MAC algorithms, and digital signatures, Design network application security schemes, such as PGP, S/ MIME, IPSec, SSL, TLS, ✦ HTTPS, SSH, etc.
45	IV/II	ORGANIZATIONAL BEHAVIOUR	CO1: Analysis the behavior of individuals and groups in organizations in terms of the key factors that influence organizational behavior.
			CO2: Access the potential effects of organizational level factors on organizational behavior
			CO3: Critically evaluate the potential effects of important developments in the external environment on organizational behavior.
			CO4: Analyse organizational behavior issues in the context of organizational behavior theories, models and concepts.
46	IV/II	DISTRIBUTED SYSTEMS	CO1: Ability to understand Transactions and Concurrency control.
			CO2: Ability to understand Security issues
			CO3: Understanding Distributed shared memory.
			CO4: Ability to design distributed systems for basic level applications
			CO1: Discuss non-conventional sources of energy and explain the working of different solar energy applications.



47	IV/II	NON-CONVENTIONAL ENERGY SOURCES	CO2: Discuss wind energy conversion systems and explain sources of geothermal energy, Describe different biogas plants and working of different gasifiers
			CO3: Explain the working principle of different fuel cells and ocean thermal energy conversion systems
			CO4: Describe the working of magneto hydro dynamic power systems and principles of energy conservation
48	IV/II	PROJECT WORK	CO1: Student 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 Academic and real time industry issues on technological front


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

S.NO	SUBJECT CODE	SUBJECT NAME	Course Outcomes
1	MA101BS	M-I	CO1: Identify the matrix representation of a set of linear equations and to analyze the solution of the system of equations
			CO2: Calculate the Eigen values and Eigen vectors
			CO3: Analyze the nature of sequence and series.
			CO4: Evaluate the improper integrals using Beta and Gamma functions
			CO5: Solve the extreme values of functions of two or three variables with/ without constraints.
2	EN105HS	English	CO1: Identify the importance of Raman Effect with technical vocabulary.
			CO2: Comprehend the importance of ancient architecture in India
			CO3: Develop interest to know the process of making Jeans.
			CO4: Examine the habits of eating in the form of essay writing
			CO5: Critically appreciate the latest technology
			CO1: Develop their confidence while giving introduction, describing a place and giving directions.
			CO2: Use various functions of english like asking for and giving information inviting people for events/occasions and requesting people

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80

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3	EN107HS	English Language and Communication Skills Lab	CO3: Narrate the past experiences and events in speaking and writing.
			CO4: Express their views and opinions logically and appropriately in spoken and written format.
			CO5: Deliver logically organised speeches and present them without hesitations.
4	AP202BS	Applied Physics	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: 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.
5	AP205BS	Applied Physics Lab	CO1: Understand the practical knowledge Energy gap of P-N junction diode: Light emitting diode.
			CO2: Determine the energy gap of a semiconductor diode.
			CO3: Understand the practical knowledge Solar Cell, Photoelectric effect, Hall effect.
			CO4: To study the Stewart – Gee's experiment.
			CO5: TO IDENTIFY Laser, Optical fibre characteristics.
6	PH102BS	Engineering	CO1: understand about Newtonian mechanics in different



		Physics	coordinates
			CO2: understanding conservation of energy and charges in harmonic oscillation
			CO3: application of wave motion in one dimension of longitudinal and transverse nature
			CO4: knowledge of light propagation in different optical devices
			CO5: application of laser and fiber optics in required areas
7	PH105BS	Engineering Physics Lab	CO1: understand the practical knowledge of Melde's experiment, Torsional pendulum: & Coupled Oscillator
			CO2: understand the practical knowledge of Newton's rings, Diffraction grating & Dispersive power
			CO3: understand the practical knowledge of LCR Circuit
			CO4: understand the practical knowledge of LASER, Optical fiber
8	CH102BS	Chemistry	CO1: Identify the knowledge of atomic, molecular and electronic changes, band theory related to conductivity.
			CO2: Comprehend the required principles and concepts of electrochemistry, corrosion and in understanding the problem of water and its treatments.
			CO3: Develop the required skills to get clear concepts on basic spectroscopy and application to medical and other fields.
			CO4: Develop the knowledge of configurationally and conformational analysis of molecules and reaction mechanisms..



			CO5: Examine the paracetamol and aspirin.
9	CH106BS	Engineering Chemistry Lab	CO1: Determination of total hardness of water by complex metric method using EDTA?HHH
			CO2: Estimation of an HCl by Conduct metric titrations.
			CO3: Verification of freundlich adsorption isotherm-adsorption of acetic acid on charcoal.
			CO4: Develop the Synthesis of Aspirin and Paracetamol.
			CO5: Examination of chloride content of water by Argentometry
10	EE103ES	Basic Electrical Engineering	CO1: To analyze and solve electrical circuits using network laws and theorems in DC circuits.
			CO2: To analyze and solve electrical circuits using network laws and theorems in AC circuits
			CO3: To understand and analyze basic Electric and Magnetic circuits
			CO4: To study the working principles of Electrical Machines
			CO5: To introduce components of Low Voltage Electrical Installations
		Basic Electrical	CO1: Get an exposure to basic electrical laws.
			CO2: Understand the response of different types of electrical circuits to different excitations.
			CO3: Understand the measurement, calculation and relation between the basic electrical parameters
			CO4:



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11	EE108ES	Engineering Lab	Understand the basic characteristics of transformers and electrical machines.
			CO5: Understand how to measure voltage current, power in AC circuits.
			CO6: Understand the performance characteristics of generators & motors.
			CO7: Understand torque-speed characteristics of motors
12	ME204ES	Engineering Graphics	CO1: under stand the basic rules of engineering graphices
			CO2: construction of the conic curves, cycloide curves and scales
			CO3: under stand the ortho projection of points ,lines & planes
			CO4: under stand the ortho projection of solides and section of solides
			CO5: under stand the surface development and intersection of solides
			CO6: evaluate the iso to ortho and ortho to iso projectiones
13	ME203ES	Engineering Mechanics	CO1: Determine resultant of forces acting on a body and analyze equilibrium of a body subjected to a system of forces
			CO2: Study the effect of friction in static and dynamic conditions
			CO3: Find the location of centroid and calculate moment of inertia of a given section.
			CO4: Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body



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			motion
			CO5: Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration


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MBA I & II Sem Course Outcomes for The

Academic Year 2018-2019

MBA Engineering I & II Sem Course Outcomes for The Academic Year 2021-2022			
S.No:	Year/Sem	Course Name	Course Out Comes
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 behaviour process for team building and group behaviour 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



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			CO4: To analyze the accounting process
			CO5: To understand the interpretation of accounting concepts
4	I-I	Research & 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
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 analyse the project evaluation techniques
			CO5: To evaluate the organizational behaviour in project management
9	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
10	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
11	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



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			i.e. Fund Flow, Cash Flow.
			CO5: Estimate working capital requirement of Business concern
12	I-II	QUANTITATIVE ANALYSIS FOR BUSINESS DECISIONS	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.
			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

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89

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			CO4: identify personal attributes that enable best use of entrepreneurial opportunities
			CO5: understand the function of the entrepreneur in the successful
15	I-II	Rural Marketing	CO1: understand the rural marketing Vs urban marketing
			CO2: explain the rural economy and environment
			CO3: Determine social and cultural aspects in rural India
			CO4: what kind of innovations in rural marketing
			CO5: write about the rural market mapping -corporate social responsibility
16	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.



17	II-I	PRODUCTION OPERATIONS MANAGEMENT	<p>CO1: Gaining knowledge about managing production processes</p> <p>CO2: How to run operations effectively.</p> <p>CO3: Better understanding of modern production techniques</p> <p>CO4: Better understanding of quality management</p> <p>CO5: You will learn about practical applications of operations management to plan for the future</p>
18	II-I	Management Information system	<p>CO1: Acquire on job the skills, knowledge, attitudes, and perceptions along with the experience needed to constitute a professional identity.</p> <p>CO2: .Get actual supervised professional experiences.</p> <p>CO3: Get insight into the working of the real organizations</p> <p>CO4: Develop perspective about business organizations in their totality</p> <p>CO5: Explore career opportunities in their areas of interest.</p>
19	II-I	DATA ANALYTICS	<p>CO1: Data will be collected around the business case after careful evaluation of the business case in a particular domain.</p> <p>CO2: A Database with the data collected in the above step will be created using SQL.</p>



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			<p>CO3: Connect the SQL database with Tableau/ Python/ R and extracting this data into environments</p> <p>CO4: Preparation of reports based on the business objective and context</p> <p>CO5: Building the dashboard using Tableau/ Power BI</p>
20	II-II	Risk Management & Financial Derivatives	<p>CO1: Be able to describe standard derivative contracts, their properties and functionality</p> <p>CO2: Be able to understand and apply scientific methods for valuation of options and other derivatives, in continuous and discrete time.</p> <p>CO3: Be able to interpret and apply risk measures that are commonly used in risk management.</p> <p>CO4: Be able to reflect over and critically survey different assumptions and principles behind derivatives pricing and risk management.</p> <p>CO5: Demonstrate an understanding of pricing forwards, futures and options contracts</p>
21	II-I	Security Analysis Portfolio Management	<p>CO1: Explored to different avenues of investment.</p> <p>CO2: Equipped with the knowledge of security analysis.</p> <p>CO3: apply the concept of portfolio management for the better investment</p> <p>CO4: invest in less risk and more return securities</p> <p>CO5: Encourage students to apply stock and option valuation models in portfolio management</p>
22	II-I	Financial Institutions Markets & Services	<p>CO1: Understand the role and function of the financial system in reference to the macro economy</p> <p>CO2: Demonstrate an awareness of the current structure and regulation of the Indian financial services</p>



			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.
23	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;
24	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.



			plans
25	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
26	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
27	II-I	Digital Marketing	CO1: Develop the applications of digital marketing in the globalized market
			CO2: Explain Channels of Digital Marketing



			CO3: Identify the digital marketing plan
			CO4: create Search engine marketing
			CO5: Analyze the Online Advertising
28	II-II	Customer Relationship Management	CO1: what is the need of CRM
			CO2: Determine the building customer relations
			CO3: Review of CRM process
			CO4: write about CRM structures
			CO5: Develop the Planning and Implementation of CRM
29	II-I	Advertising and Sales Management	CO1: write about Visualization of Advertising Layout
			CO2: Identify the evaluation of advertising effectiveness
			CO3: Understand the process of sales management
			CO4: describe the sales promotion
			CO5: Evaluate the need for distribution channels and managing them.
30	II-I	Consumer Behaviour	CO1: Demonstrate how knowledge of consumer behaviour can be applied to marketing.
			CO2: Identify and explain factors which influence consumer behavior
			CO3: Relate internal dynamics such as personality, perception, learning motivation and attitude to the choices consumers make.
			CO4: Use appropriate research approaches including sampling, data collection and questionnaire design for



KSHATRIYA COLLEGE OF ENGINEERING

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			specific marketing situations
			CO5: In a team, work effectively to prepare a research report on consumer behaviour issues within a specific context.
31	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
32	II-II	International Marketing	CO1: Explain the Global Marketing Management
			CO2: Understand the concept of Environment of global markets
			CO3: Analyze Assessing Global Market Opportunities
			CO4: Developing and Implementing Global Marketing Strategies
			CO5: Select the E-Marketing channels organization & controlling of the global marketing programme
33	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
34	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
35	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



KSHATRIYA COLLEGE OF ENGINEERING

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			management approaches and leadership theories
			CO5: Is able to formulate and effectively communicate a change vision in an organizational setting.
36	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
37	II-II	Services Marketing	CO1: Identify Marketing Management of companies offering Services
			CO2: describe the Characteristics of services
			CO3: understand consumer behaviour in services
			CO4: Collect align service design and standards
			CO5: Correlate the delivering service and managing services promises.
38	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



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			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.
35	II-II	STRATEGIC INVESTMENT AND FINANCING DECISIONS	CO1: Students will be able to understand Investment Decisions in Risk and uncertainty
			CO2: Strategic investment decisions
			CO3: Investment Appraisal Techniques
			CO4: Financing Decisions
35	II-II	RISK MANAGEMENT	CO1 : Students will be able to understand Concepts of Risk Management
			CO2: Risk Management Measurement
			CO3: Risk Management using Forward and Futures
			CO4: Risk Management using Options and Swaps.


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