

**Engineering  
Program Outcomes:**

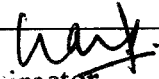
- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization for the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, research literature, and analyse complex engineering problems reaching 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 public health and safety, and 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 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 societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- 7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- 10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- 11. Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- 12. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



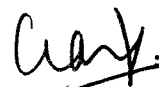
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**Course Outcomes:****Program wise****Department of Applied Sciences and Humanities**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Chemistry	KAS102/ KAS202	<p>CO1. To identify the structure of molecules, their bonding, difference between Liquid crystals and solid crystals and also understand the knowledge of their applications in various appliances.</p> <p>CO2. To Identify techniques to solve the problems related to analyzed micro samples.</p> <p>CO3. To apply electrochemical theory for the identification of corrosion problem.</p> <p>CO 4. To identify the technique which can be used to solves the water pollution problems. To analysis fuels by using various techniques. To develop ability to understand how different appliances can be properly utilized.</p> <p>CO5. To categorize the new methods for preparing new polymeric material which is non polluting and also understand how different substances can be developed.</p>
2.	Physics-I	KAS101/ KAS/201	<p>CO1. To justify the theory of relativity with various applications and explain the Einstein's mass energy equivalence.</p> <p>CO2. To apply the concept of displacement current and applications of Maxwell equations. Students will be able to indentify the behavior of em. wave.</p> <p>CO3. To explain the distribution of energy in black body radiation, to justify the matter wave and particle nature with use of Schrodinger wave equation and Compton effect.</p> <p>CO4. To explain the behavior of waves through various examples/applications of interference and diffraction phenomenon and the concept of grating and resolving power.</p> <p>CO5. To solve the problems related to optical fiber and categorized its characteristics and applications. To apply the concept of Laser.</p>
3.	Maths-I	KAS-103	<p>CO1. Understand the concept of Leibnitz theorems, Identify the application of partial differentiation, concept of curve tracing</p> <p>CO2. Illustrate the working methods for evaluating maxima, minima, series and Jacobians.</p> <p>CO3. Remember the concept of matrices and apply for solving linear simultaneous equations. Also understand the concept of Vector Spaces, Linear transformations.</p> <p>CO4. Illustrate the working methods of multiple integral and apply for finding area, volume, surface area.</p> <p>CO5. Remember the concept of vector and apply for directional derivatives, tangent and normal planes. Also evaluate line, surface and volume integrals.</p>
4.	Maths-II	KAS-203	<p>CO1. Understand the concept of differentiation and apply for solving differential equations.</p> <p>CO2. Apply the concept of power series to find the solution of second order ordinary differential equations with variable coefficient.</p> <p>CO3. Remember the concept of Laplace transform and apply in solving real life problems</p> <p>CO4. Remember the concept of partial differential equations to solve partial differential equation. Also understand the concept of Fourier series.</p>

  
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			CO5. Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations
5.	Maths-III	RAS-301	CO1. Illustrate the working methods of complex functions and apply for finding analytic functions. Apply the complex functions for finding Taylor's series, Laurent's series and evaluation of definite integrals. CO2. Understand the concept of Fourier and Z – transform to evaluate engineering problems CO3. Understand the concept of moments, curve fitting, regression. Apply the concept of probability to evaluate probability distributions. CO4. Apply Bisection, Regula Falsi, Newton Raphson method to solve algebraic and transcendental equations. Also, understand the concept of interpolation. CO5. Understand the concept of numerical differentiation and integration and to solve ordinary differential equations. Also apply the numerical techniques to solve simultaneous linear equations
6.	EVS	RAS-302/ RAS-402	CO1. To develop ability to understand interrelationship between human beings and nature. Recognizing basic component of environment i.e. air, water, and soil and ecology. CO 2. To identify the quantity and quality of natural resources and how natural resources can be available for a long time. CO 3. Identify problem of pollution along with its solution. CO 4. To categorize the role of individual, NGOs and Government for environment protection activities.
7.	Industrial Management	RAS-601	CO 1. To develop ability to identify, formulate and solve engineering and managerial problems. To design a system or process to meet desired needs within realistic constraints such as economic, environmental, social ethical, political. CO 2. To design, and implement integrated systems that include people, materials, information and equipment with the help of management concept. CO 3. To contribute to the success of organizations through effective problem solving and to ensure regular supply of goods by the study of concepts of inventory and Supply Chain Management. CO 4. To develop the ability to apply knowledge of mathematics, engineering and management to ensure effective management of business operations. To assure to continue to develop holistically, including the personal and professional skills which are necessary to adapt to our changing societal, technological and global environments.




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8.	Managerial Economics	RAS-501	<p>CO1: To make students understand practical use of engineering and its relationship with economics. To measure the responsiveness of consumers' demand to changes in the price of a good or service, the price of other goods and services and income of the consumer.</p> <p>CO2: To understand economic situations from producers' point of view. To understand supply related issues and importance of demand forecasting and its techniques in business decisions</p> <p>CO3: To understand different costs of production and how they affect short and long run decisions. Understand economies of scale, diseconomies of scale and how each affects the cost of production.</p> <p>CO4: To understand basic market models of perfect competition, monopolistic competition, monopoly, oligopoly and how price and quantity are determined in each model. To drive the equilibrium conditions for cost minimization and profit maximization.</p> <p>CO5: To apply the economic way of thinking to individual decisions and business decisions by the study of different concepts of National income, Inflation, Business cycle.</p>
9.	Laser Application	ROE 033 /043	<p>CO 1. Students will be able to understand the fundamental of Quantum mechanics. They will be able to solve the complex applications based on Schrödinger wave equation &amp; anomic structure of atoms.</p> <p>CO 2. Students will able to understand about the basic characteristics and fundamentals of lasers.</p> <p>CO 3. By study the main component and type of lasers. Students will be able to differentiate working of different lasers on the basis of output wavelength.</p> <p>CO 4. Student will be able to study the various type of lasers based on their active medium, pumping scheme and output.</p> <p>CO 5. Students will be able to know about various practical applications of lasers in the real world.</p>
10.	Professional English	KAS-204	<p>CO1: Students will be enabled to understand the basics of Professional Communication, it's meaning, features, flow and importance etc.</p> <p>CO2: Students would be able to create substantial base by the formation of strong professional vocabulary for its application at different platforms. They will be made to evaluate the correct &amp; error-free writing by being well versed in rules of English grammar. They will also learn the art of writing a paragraph to use it in professional communication.</p> <p>CO3: Students will learn to write professional letters, technical reports and proposals for successful communication at their work place.</p> <p>CO4: Students will be honed up in the art of oral presentation by knowing presentation strategies and soft skills. They will learn body language and voice-dynamics to enhance the communication skills. They will improve their personality by developing interpersonal skills, attitude, team work etc.</p> <p>CO5: The students will improve their reading and writing skills by reading various essays. They will learn the use of science for human welfare through the essays in the course.</p>
11.	Operation Research	NOE-073	<p>CO1: To understand the concept of linear programming problem with their formulation, use to get the solution of lpp by graphical method, by simplex, by two phase method, by big-m method with special case of lpp and dual simplex.</p>

  
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			<p>CO2: To understand the concept of transportation problem and assignment problem and get the solution of these problems, understand the concept of machine job sequencing problem and its solution.</p> <p>CO3: To understand the concept of shortest path with spanning tree max flow and min-cost. phase of project management , guidelines for network construction ( cpm-pert ).</p> <p>CO4: To understand the concept of rectangular game with their solutions and queuing problem with their solution.</p> <p>CO5: To understand the concept of replacement problem with their solutions and inventory problem concept with their solution.</p>
12.	Entrepreneurship Development	NOE-071	<p>CO1: Students will able to have the Identify the basic concepts in the area of entrepreneurship and to know the importance of various level of industries.</p> <p>CO2: Developing personal creativity in the field of entrepreneurship and taking entrepreneurial initiative.</p> <p>CO3: Adoption of the key steps in the elaboration of business idea.</p> <p>CO4: Explain the stages of the entrepreneurial process and the resources needed for the successful development of entrepreneurial ventures.</p> <p>CO5: Categorize the importance of various acts and laws of entrepreneurship for economic development.</p>
13.	Sociology	RAS-502/602	<p>CO1: Demonstrate critical thinking skills by analyzing and evaluating social and political arguments, across a variety of areas such as human relations in industry, inequality and scientific management.</p> <p>CO2: Enhance the knowledge of rise and development of industry, early industrialization, and various characteristics of factory system along with consequences of industrialization.</p> <p>CO3: Understanding about Industrial policy resolution 1956, Science, Technology and Innovation policy of India 2013.</p> <p>CO4: Apply several procedures to handle the problems of grievances, disputes, strikes and lockouts in industries. Understanding the various codes of discipline, labor courts and industrial tribunals.</p> <p>CO5: Preparation for future aspects in industrialization models such as sociological concerns, consumer society and environmental studies. Demonstrate the knowledge of core sociological concepts.</p>

  
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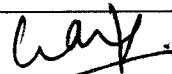
**Department of Computer Science & Engineering**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Programming for problem solving	KCS-101/ KCS-201	<p>CO 1: To develop simple algorithms for arithmetic and logical problems.</p> <p>CO 2: To translate the algorithms to programs &amp; execution in C Language.</p> <p>CO 3: To implement conditional branching, iteration and recursion.</p> <p>CO 4: To decompose a problem into function and synthesize a complete program using divide and conquer approach.</p> <p>CO 5: To use arrays, pointers and structures to develop algorithms and programs.</p>
2.	Cyber Security	RVE-201	<p>CO 1. To understand about the Information Systems, Types of Information Systems, Development of Information Systems, Introduction to Information Security, Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis.</p> <p>CO 2. Study about how to secure our information &amp; system (Database, E-mail and Internet), Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack, Security Threats to E-Commerce- Electronic Payment System, e- Cash, Credit/Debit Cards. Digital Signature, Public Key Cryptography.</p> <p>CO 3. How to develop secure information system for Application Development Security, Information Security Governance &amp; Risk Management, Security Architecture &amp; Design Security Issues in Hardware, Data Storage &amp; Downloadable Devices, Physical Security of IT Assets, Access Control, CCTV and Intrusion Detection Systems, Backup Security Measures.</p> <p>CO 4. To Study about the Security Policies Development of Policies, WWW Policies, Email Security Policies, Policy Review Process-Corporate Policies-Sample Security Policies, Publishing and Notification Requirement of the Policies. – Mobile, Cloud, Outsourcing, SCM.</p> <p>CO 5. To understand the concept and procedure of Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law: Copy Right Law, Software License, Semiconductor Law and Patent Law</p>
3.	Digital Logic Design	REC-301	<p>CO 1. Students will able to know the digital world include number system, binary codes, logic gates, Boolean functions and representation in SOP and POS form. Minimization using KMAP and Tabular method and its relevance.</p> <p>CO 2. To design and analysis of Combinational logic circuits such as adder, sub actor, multiplier, comparator, decoder, convertors encoder, multiplexer and DE multiplexer.</p> <p>CO 3. To design the basic memory element, latch and flip-flops, and conversions. Applications of flip-flops such as Registers and Counters.</p> <p>CO 4. To design and analysis of various synchronous and asynchronous sequential logic circuits, state machines and minimizations of states, Hazards</p> <p>CO 5. To design memories as RAM, ROM , PLA and PAL , and to know digital logic families.</p>

  
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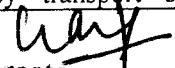
4.	Discrete Structures and Theory of Logic	RCS-301	<p>CO 1: Understand the basics of Set, Relation and function. Attempt the approach of mathematical induction.</p> <p>CO 2: Understand the basics of Group, Subgroup, Ring and Field. Proof the properties of these.</p> <p>CO 3: Study partial Ordered Set, lattice and Boolean Algebra. Proof the various properties of these.</p> <p>CO 4: Understand the concept of Well-formed Formula, Propositional logic and Predicate logic.</p> <p>CO 5: Understand the concept of Tree, Graph, Recurrence Relation and Generating Function.</p>
5.	Computer Organization and Architecture	RCS-302	<p>CO 1. Study of the basic structure and operation of a digital computer system, Analysis of the design of arithmetic &amp; logic unit and understanding of the fixed point and floating point arithmetic operations</p> <p>CO 2. Implementation of control unit techniques</p> <p>CO 3. Understanding the hierarchical memory system, cache memories and virtual memory</p> <p>CO 4. Understanding the different ways of communicating with I/O devices and standard I/O interfaces</p> <p>CO 5. Understanding various architectural designs of computer system, analysis of various performance laws and implementation of the concept of Pipelining</p>
6.	Data Structures using C	RCS-305	<p>CO 1: Describe how arrays, records, linked structures, are represented in memory and used by algorithms.</p> <p>CO 2: Describe and able to implement common applications of stacks and queues. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.</p> <p>CO 3: Understand and able to implement different methods for traversing binary trees.</p> <p>CO 4: Able to describe and explain the concept of graphs and its applications.</p> <p>CO 5: Describe the principal algorithms for sorting, searching, and hashing and the concept of search trees.</p>
7.	Operating System	RCS-401	<p>CO 1: Describe the important computer system resources and the role of operating system in their management policies and algorithms.</p> <p>CO 2: Understand the process management policies and scheduling of processes by CPU</p> <p>CO 3: Evaluate the requirement for process synchronization and coordination handled by operating system</p> <p>CO 4: Describe and analyse the memory management and its allocation policies.</p> <p>CO 5: Identify use and evaluate the storage management policies with respect to different storage Management technologies.</p>
8.	Software Engineering	RCS-402	<p>CO 1: An understanding of different software processes and how to choose between them.</p> <p>CO 2: How to elicit requirements from a client and specify them.</p> <p>CO 3: Design in the large, including principled choice of software architecture, the use of modules and interfaces to enable separate development, and design patterns.</p> <p>CO 4: Various quality assurance techniques, including unit testing, functional testing, and automated analysis tools.</p> <p>CO 5: An understanding of software evolution and related issues such as version management.</p>
9.	Theory of Automata and Formal Languages	RCS-403	<p>CO 1: Students will have knowledge of basic concepts of Automata Theory and Formal Languages, ability to design and optimize Finite Automata for simple regular languages</p> <p>CO 2: Students will be able to design regular expression for simple</p>

			<p>regular languages and convert among the tools defining regular languages i.e. Regular Expression, NFA, epsilon NFA, DFA</p> <p>CO 3: Students will be able to write Context Free Grammar for simple Context Free Languages and Regular Languages.</p> <p>CO 4: Students will be able to design Push Down Automata for simple Regular Languages, Context Free Languages to convert CFG and PDA to each other</p> <p>CO 5: Students will be able to design Turing Machine for some simple languages and tasks</p>
10.	Universal Human Values and Professional Ethics	RVE-401	<p>CO1: Finding Need, Basic Guidelines, Content and Process for Value Education</p> <p>CO2: Defining Harmony in the Human Being - Harmony in Myself and identifying human as co-existence of Self (I) and body.</p> <p>CO3: Defining Harmony in the Family and Society- Harmony in Human-Human Relationship and recognizing the nine feeling of self (I).</p> <p>CO4: Defining Harmony in the Nature and Existence - Whole existence as Co-existence and identifying and recognizing Interconnectedness and mutual fulfillment among the four orders of nature.</p> <p>CO 5: Implications of the above Holistic Understanding of Harmony at all Levels of Existence</p>
11.	Introduction to Microprocessor	REC-405	<p>CO 1: Explain the architecture, pin configuration of various microprocessors and Interfacing ICs.</p> <p>CO 2: Analyze a detailed s/w &amp; h/w structure of the Microprocessor.</p> <p>CO 3: Identify various addressing modes.</p> <p>CO 4: Perform various microprocessor based programs.</p> <p>CO 5: Interpret &amp; solve various problems using microprocessor.</p>
12.	Data structure	RCS-405	<p>CO 1: Describe how arrays, records, linked structures, are represented in memory and used by algorithms.</p> <p>CO 2: Describe and able to implement common applications of stacks and queues. Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.</p> <p>CO 3: Understand and able to implement different methods for traversing binary trees.</p> <p>CO 4: Able to describe and explain the concept of graphs and its applications.</p> <p>CO 5: Describe the principal algorithms for sorting, searching, and hashing and the concept of search trees.</p>
13.	Design & Analysis of Algorithm	RCS-502	<p>CO 1: Derive and solve recurrences describing the performance of divide-and-conquer algorithms. Explain various asymptotic notations and Compute the efficiency of given algorithms.</p> <p>CO 2: Explain the different tree based problems. Employ trees to model engineering problems, when appropriate.</p> <p>CO 3: Applied greedy algorithms on various applications and graph problems and analyze them.</p> <p>CO 4: Understand different problems based on dynamic programming approach and applied them on different problems.</p> <p>CO 5: Illustrate the NP completeness and NP hard problem. Analyze benefit of using approximation and randomized algorithms. Compare different string matching algorithms</p>
14.	Database Management System	RCS-501	<p>CO1: Defining DBMS and its components and also preparing E-R diagram.</p> <p>CO2: Preparing and executing relational, tuple, domain and SQL query.</p> <p>CO3: Preparing relational database design and contrasting different normal forms.</p> <p>CO4: Testing serial inability of transaction and to define distributed database.</p>

  
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			CO5: Comparing various concurrent control techniques and recovery mechanism.
15.	Principle of Programming Language	NCS-503	CO1: To classify various programming languages on basis of their Evolution and its working Structure (Blooms Level 2) CO2: To infer knowledge about various constructs used in programming languages (BLOOMS LEVEL 2) CO3: To sketch new subprograms using the working of Sub program and scope rules (BLOOMS LEVEL 3) CO4: To Relate parameters of object oriented programming language with concurrency management and event handling (Blooms Level 2) CO5: To interpret the working of functional and logic program-ming language with brief knowledge of various programming languages such as ML and LISP.(Blooms Level 2)
16.	Web Technology	RCS-E12	CO 1: Understand the concepts of Client-server architecture and can develop programs in using Core Java programming. CO 2: design and Develop website using HTML, CSS, XML and DHTML. CO 3: Develop interactive website using java script and well under stand ability of networking concepts. CO 4: Connect a java program to a DBMS and perform insert, update and delete operations on DBMS table. CO 5: Write a server side java application in JSP or Servlet to catch data sent from client, process it and store it on database.
17.	Cyber Security	RUC-501	CO 1: To understand about the Information Systems, Types of Information Systems, Development of Information Systems, Introduction to Information Security, Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis. CO 2: Study about how to secure our information & system (Database, E-mail and Internet), Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack, Security Threats to E-Commerce- Electronic Payment System, e- Cash, Credit/Debit Cards. Digital Signature, Public Key Cryptography. CO 3: How to develop secure information system for Application Development Security, Information Security Governance & Risk Management, Security Architecture & Design Security Issues in Hardware, Data Storage & Downloadable Devices, Physical Security of IT Assets, Access Control, CCTV and Intrusion Detection Systems, Backup Security Measures. CO 4: To Study about the Security Policies Development of Policies, WWW Policies, Email Security Policies, Policy Review Process-Corporate Policies-Sample Security Policies, Publishing and Notification Requirement of the Policies. – Mobile, Cloud, Outsourcing, SCM. CO 5: To understand the concept and procedure of Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law: Copy Right Law, Software License, Semiconductor Law and Patent Law
18.	Computer Networks	RCS-601	CO1: Understanding & analysing the basics of Computer Networks as well as that of elements used to construct it, such as protocols, hardware etc. CO2: Analysing & evaluating the working of Data Link Layer and services provided by it to above layers. Error handling discussed. CO3: Analysing the working & evaluating services provided by network layer in brief. Routing and IPv4 IPv6 and packet format demystified. CO4: Services and features provided by transport session and

  
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			<p>presentation layer discussed and elaborated in brief.</p> <p>CO5: Application layer discussed along with various underlying protocols and networks in detail. Various applications at this layer discussed.</p>
19.	Compiler Design	RCS-602	<p>CO 1: Understand the concept of translator and various phases involved in the compilation process.</p> <p>CO 2: Able to implement the parsing techniques for the given programming construct</p> <p>CO 3: Understand the different representations of intermediate code.</p> <p>CO 4: Understand the use of symbol table and apply different error recovery routines to recover the errors seen at different phases of compilation.</p> <p>CO 5: Able to describe techniques for machine code generation and its optimization.</p>
20.	Computer Graphics	RCS-603	<p>CO 1: Understand the basics of computer graphics, different graphics systems and its applications. They can also implement various algorithms to scan, convert the basic geometrical primitives.</p> <p>CO 2: To perform transformations, Area filling, and clipping techniques to images. They can also extract scene with different clipping methods and its transformation to graphics display devices.</p> <p>CO 3: Work on the basic principles of 3- dimensional computer graphics.</p> <p>CO 4: Explore projections and visible surface detection techniques.</p> <p>CO 5: Render projected objects to naturalize the scene in 2D view and use of illumination models for this.</p>
21.	Cyber Security	RUC-601	<p>CO 1: To understand about the Information Systems, Types of Information Systems, Development of Information Systems, Introduction to Information Security, Need for Information Security, Threats to Information Systems, Information Assurance, Cyber Security, and Security Risk Analysis.</p> <p>CO 2: Study about how to secure our information &amp; system (Database, E-mail and Internet), Data Security Considerations-Backups, Archival Storage and Disposal of Data, Security Technology-Firewall and VPNs, Intrusion Detection, Access Control. Security Threats -Viruses, Worms, Trojan Horse, Bombs, Trapdoors, Spoofs, E-mail Viruses, Macro Viruses, Malicious Software, Network and Denial of Services Attack, Security Threats to E-Commerce- Electronic Payment System, e- Cash, Credit/Debit Cards. Digital Signature, Public Key Cryptography.</p> <p>CO 3: How to develop secure information system for Application Development Security, Information Security Governance &amp; Risk Management, Security Architecture &amp; Design Security Issues in Hardware, Data Storage &amp; Downloadable Devices, Physical Security of IT Assets, Access Control, CCTV and Intrusion Detection Systems, Backup Security Measures.</p> <p>CO 4: To Study about the Security Policies Development of Policies, WWW Policies, Email Security Policies, Policy Review Process- Corporate Policies-Sample Security Policies, Publishing and Notification Requirement of the Policies. – Mobile, Cloud, Outsourcing, SCM.</p> <p>CO 5: To understand the concept and procedure of Information Security Standards-ISO, IT Act, Copyright Act, Patent Law, IPR. Cyber Laws in India; IT Act 2000 Provisions, Intellectual Property Law:Copy Right Law, Software License, Semiconductor Law and Patent Law</p>

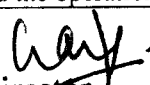
  
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22.	Artificial Intelligence	NCS-701	<p>CO 1: To understanding of the fundamental theories, concepts, and applications of Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.</p> <p>CO 2: An ability to apply knowledge of computing and mathematics appropriate to the discipline the Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha - Beta pruning.</p> <p>CO 3: To understand about the Knowledge Representation &amp; Reasoning: Propositional logic, Theory of first order logic, Inference in First order logic, Forward &amp; Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.</p> <p>CO 4: To Study about the Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning.</p> <p>CO 5: To understand the concept and techniques of Pattern Recognition , Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods - Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Classification Techniques – Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering</p>
23.	Software Testing & Audit	NCS-071	<p>CO 1: Have an ability to apply software testing knowledge and engineering methods. Have an ability to design and conduct a software test process for a software testing project. Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.</p> <p>CO 2: Detailed knowledge of functional testing and structural testing. Implement various test processes for quality improvement. Design test planning.</p> <p>CO 3: Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods</p> <p>CO 4: Have an ability to identify the needs of software test data generation and automation, and define and develop a test tool to support test data generation and automation.</p> <p>CO 5: Apply the software testing techniques in commercial environment. Use practical knowledge of a variety of ways to test software and an understanding of some of the tradeoffs between testing techniques.</p>
24.	Cryptography & Network Security	NIT-701	<p>CO1: To be able to explain the foundations of cryptography and network security, and able to demonstrate the role of encryption to protect data.</p> <p>CO2: To be able to apply and demonstrate mathematics behind the cryptography.</p> <p>CO3: To be able to analyze security issues arising from the use of certain types of technologies.</p> <p>CO4: To be able to identify the appropriate procedures required to secure networks.</p> <p>CO5: To be able to identify the appropriate procedures required for system security testing and procedure of Backup and recovery.</p>

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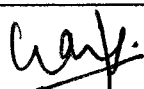
25.	Entrepreneurship Development	NOE-071	<p>CO1: Students will be able to have the understanding of the basic concepts in the area of entrepreneurship and to know the importance of various levels of industries.</p> <p>CO2: Developing personal creativity in the field of entrepreneurship and taking entrepreneurial initiative.</p> <p>CO3: Adoption of the key steps in the elaboration of business idea.</p> <p>CO4: Understanding the stages of the entrepreneurial process and the resources needed for the successful development of entrepreneurial ventures.</p> <p>CO5: Understanding the importance of various acts and laws of entrepreneurship for economic development.</p>
26.	Software Project Management	NOE-077	<p>CO1: Make use of the basic concepts of software project management and effectively plan the software projects.</p> <p>CO2: Design the software project schedule</p> <p>CO3: Utilize different methods for monitoring, visualizing and controlling the progress of the software projects.</p> <p>CO4: Illustrate the types of software testing and software quality parameters.</p> <p>CO5: Explain the concept of software configuration and risk management.</p>
27.	NCER(OE II)	NOE-081	<p>CO1: Understand the fundamentals and main characteristics of renewable energy sources and their differences compared to fossil fuels.</p> <p>CO2: Understand the extent of environmental impact and resource depletion of each of the major non-renewable and renewable sources of energy.</p> <p>CO3: Identify the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.</p> <p>CO4: Be able to apply this knowledge to suggest the preferred combination of sustainable solutions/actions to minimize the emission of greenhouse gases and increase sustainability of the energy system in specific areas/regions</p>
28.	Digital Image Processing	NCS-801	<p>CO1: To understand image formation and concepts of Digital Image processing system &amp; evaluation techniques for image enhancement.</p> <p>CO2: Analyze images in frequency domain using transform</p> <p>CO3: To understand and interpret restoration techniques for images</p> <p>CO4: Design and analysis of structure of images using Morphological techniques</p> <p>CO5: Understand the concept of image registration and analysis of segmentation and feature extraction techniques.</p>
29.	Real Time System	NCS-082	<p>CO1: Understand the real time applications and their timing constraints for processors and resources.</p> <p>CO2: Implement the various real time Scheduling techniques for optimal and effective processing.</p> <p>CO3: Understand and implement efficient usage of resources by using various preemptive and non-preemptive access protocols.</p> <p>CO4: Understand the model of real time communication and disciplines of access control protocols.</p> <p>CO5: Understand the operation of real time OS and database constraints.</p>
30.	Data Compression	NCS-085	<p>CO1: Understand the compression mechanism and basics behind compression algorithms.</p> <p>CO2: Implement the compression techniques to compress the different raw data.</p> <p>CO3: Understand and implement lossless compression techniques and dictionary techniques.</p> <p>CO4: Understand the operation behind Lossy compression mechanism and Scalar Quantization.</p> <p>CO5: Understand the operation of Vector Quantizer.</p>

  
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**Department of Civil Engineering**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Building material and construction	RCE 301	CO1 Identify the factors to be considered in construction of buildings and develop the construction practices and techniques. CO2 Define the engineering principles relevant to civil engineering materials. CO3 Select appropriate material for construction of building. CO4 Identify the components of building and differentiate various types of building materials depending on its function. CO5 Plan various construction related activities. CO6 Assess various precautionary measures pertaining to construction materials
2.	Surveying	RCE-302	CO1 To understand the importance of surveying in the field of civil engineering. CO2 To study the basics of linear/angular measurement methods like chain surveying, compass surveying. CO3 To study the significance of plane table surveying in plan making. CO4 To know the basics of leveling and theodolite survey in elevation and angular measurements.
3.	Fluid Mechanics	RCE 303	CO1 To give fundamental knowledge of fluid, its properties and behavior under various conditions of internal and external flows. CO2 To develop understanding about hydrostatic law, principle of buoyancy and stability of a floating body and application of mass, momentum and energy equation in fluid flow. CO3 Understanding of analyzing flow systems in terms of mass, momentum, and energy balance CO4 To develop understanding about hydrostatic law, principle of buoyancy and stability of a floating body and application of mass, momentum and energy equation in fluid flow. CO5 To imbibe basic laws and equations used for analysis of static and dynamic fluids. CO6 To inculcate the importance of fluid flow measurement and its applications in Industries.
4.	Mechanics of Solid	RME 303	CO1 To understand the basics of material properties, stress and strain. CO2 To apply knowledge of mathematics, science, for engineering applications CO 3 Ability to identify, formulates, and solve engineering & real life problems CO4 Ability to design and conduct experiments, as well as to analyze and interpret data CO5 Ability to design a component to meet desired needs within realistic constraints of safety. So you all are invited for suggestion, you can suggest by filling the form provided at the end of post.
5.	Hydraulics & Hydraulic Machines	RCE 401	CO1 To know the different types of flows and channels. CO2 To understand the performance of turbines and pumps. CO3 To know the applications of momentum principles. CO4 To make the student is expected to prepare models for prototypes of hydraulic structures. CO5 To make the student is expected to have thorough knowledge on the selection of turbines and pumps for practical purposes
6.	Universal Human Value & Professional	RVE 301	CO 1: It ensures students sustained Happiness through identifying the essentials of Human Values and Skills CO 2: It facilitates correct understanding between Profession and

  
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	Ethics		<p>Happiness</p> <p>CO 3: It helps students understand practically the importance of trust, mutually satisfying human behavior and enriching interaction with nature.</p> <p>CO 4: Ability to develop appropriate technologies and management patterns to create harmony in professional and personal</p> <p>CO 5 Ability to utilize the professional competence for augmenting universal human order, Ability to identify the scope and characteristics of people-friendly and eco-friendly production systems</p>
7.	Geoinformatics	RCE 402	<p>CO1 Explain basic physical principles of remote sensing</p> <p>CO2 Understand the basic difference between various kinds of satellites and sensors</p> <p>CO3 Know the appropriate use of satellite data for different applications</p> <p>CO4 Explain the principles of thermal and microwave satellites, sensors and their nature of the data</p> <p>CO5 Apply remote sensing in different thematic studies</p>
8.	Structural Analysis	RCE-403	<p>CO1 Classification of Determinate and Indeterminate Structures, analysis of cable on different loading condition</p> <p>CO2 Analysis of determinate plane trusses by different method</p> <p>CO3 Strain Energy, Maxwell's reciprocal &amp; Betti's theorem, Castigliano's theorems. Analysis of statically determinate beams, frames and trusses.</p> <p>CO4 Rolling loads and influence line diagrams for determinate beams and trusses</p> <p>CO5 Analysis of three hinged parabolic and circular Arches. moving load &amp; influence lines for three hinged arch.</p>
9.	Environment & Ecology	RAS 402	<p>CO1 Understand core concepts and methods from ecological and physical sciences and their application in environmental problem-solving.</p> <p>CO2 Appreciate key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions.</p> <p>CO3 Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.</p> <p>CO4 Appreciate that one can apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.</p> <p>CO5 Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.</p>
10.	Geotechnical Engineering	RCE-501	<p>CO1 Characterize and classify soils</p> <p>CO2 Identify shear strength parameters for field conditions</p> <p>CO3 Compute and analyze the consolidation settlements</p> <p>CO4 Understand the principles of compaction and its control</p>
11.	Design of Structure I	RCE-502	<p>CO1 Classify &amp; discuss statically determinate &amp; indeterminate structure</p> <p>CO2 Apply &amp; Analyze the concept of influence lines for deciding the critical forces and sections while designing.</p> <p>CO3 Apply concept of strain energy and analyze redundant frames</p> <p>CO4 Explain the importance of horizontal thrust in maintaining parabola of two hinged parabolic arch for external loading and analyze the same</p> <p>CO5 Identify, analyze, &amp; solve problems using slope deflection</p>

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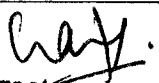
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			method. CO6 Apply the concept of force to solve indeterminate structure
12.	Quantity Estimation and Management	RCE-503	CO1: Measurement of different items and works used in construction work by different methods like long wall short wall methods and centre line method. CO2: Analysis of different rates for different works like labour, equipment, etc and contract management and tender preparation for monitoring of cost and time as well as settlement of any dispute if happen. CO3: Bar chart, milestone chart and other network technologies for like PERT CPM, for project and cost monitoring. CO4: Equipment used for construction project, their operational techniques and proper maintenance. CO5: Bar chart, milestone chart and other network technologies for like PERT CPM, for project and cost monitoring.
13.	Concrete Technology	RCE-052	CO1 Identify Quality Control tests on concrete making materials CO2 Understand the behavior of fresh and hardened concrete CO3 Design concrete mixes as per IS and ACI codes CO4 Understand the durability requirements of concrete CO5 Understand the need for special concretes
14.	Geo-environmental Engineering	RCE-053	CO-1 To know about waste generation and its impact on environment CO-2 To explain the engineering properties of various waste. CO-3 Identify contaminant transport mechanisms in soils CO-4 Specify site investigation techniques for characterization of contaminated site CO-4 To explain the selection & design of landfill. CO-5 To explain the various concept of waste remedial techniques.
15.	Design of concrete structure-2	NCE-601	CO-1 Introduction to flat slab and their structural importance. Nature of stress developed in flat slab. Designing of flat slab with and without drop panel by IS Code method CO-2 Analysis and design of beam curved in plan. Types of footing and Structural behaviour of footings, design of footing different types of footing. CO-3 Introduction of retaining wall, Types of retaining wall and their design by IS code method. forces and I.R.C. bridge loadings, Design of R.C. slab culvert CO-4 Design criteria of water tank , design concept of circular and rectangular tanks situated on the ground and underground, design of overhead tanks. CO-5 Introduction to prestress and advantages of prestressing, methods of prestressing, losses in prestress, analysis of simple prestressed rectangular and T-section.
16.	Environmental Engineering-II	RCE-602	CO-1 Plan wastewater treatment projects and pollution control. CO-2 Design treatment processes for various criteria pollutants CO-3 Appreciate the importance and methods of operation and maintenance of wastewater treatment systems CO-4 decide suitable methods for treating wastewater under Indian conditions and methods for waste reduction, recycling and reuse of industrial wastewater. CO-5 Define and evaluate project alternatives on basis of chosen selection criteria. CO-6 Communicate effectively in oral and written presentations to technical and non-technical audiences
17.	Transportation Engineering	RCE-603	CO1 Exhibit the knowledge of planning, design and the fundamental properties of highway materials in highway


  
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			<p>engineering.</p> <p>CO2 Acquire the knowledge of geometric design and draw appropriate conclusion.</p> <p>CO3 Understand and use the concept of different methods in design, construction, inspection and maintenance of the pavement.</p> <p>CO4 Undertake various Traffic studies and apply the knowledge in planning and design of pavement and geometrics.</p> <p>CO5 Understand and describe the terms related to bridge, hydrological parameters and code of practices in bridge design.</p> <p>CO6 Understand the different sub-structures and super-structures of a bridge and its construction, rating and maintenance.</p>
18.	Foundation Design	RCE-061	<p>CO1 Identify a suitable foundation system for a structure.</p> <p>CO2 Evaluate the importance of raft foundation and principles of design for buildings and tower structures.</p> <p>CO3 Analyse and design pile foundations.</p> <p>CO4 Examine and discuss various machine foundations.</p> <p>CO5 Analyse and design Sheet piles and cofferdams.</p>
19.	Geo-synthetics and Reinforced Soil	RCE-063	<p>CO 1 To understand the emerging trends of Geosynthetic in Geotechnical Engineering</p> <p>CO 2 To evaluate the different properties of including different tests</p> <p>CO 3 To analyze the functions of geosynthetic and its suitability</p> <p>CO 4 To design different structures using geosynthetics according to various applications.</p>
20.	Design of Steel Structure	NCE-701	<p>CO1 Introduction to steel structure , Advantages and disadvantages of Steel as a Structural Material, types of Steel Sections, Loads acting on steel structure and their calculation as per IS Code., Design Philosophies</p> <p>CO2 Introduction to Riveted Connections, Bolted Connections, welded connection and Designing Connections with different loading condition as per IS Code .</p> <p>CO3 Introduction to Tension Members, , Types of Failure, Design Strength of Tension Members.</p> <p>CO4 Introduction to compression member its Effective Length, Slenderness Ratio (<math>\lambda</math>), Design of Axially Loaded Compression Members.</p> <p>CO5 Introduction to Behaviour of Beam in Flexure, Laterally supported and unsupported Beams, design of Purlins, Introduction to Plate Girder and Gantry Girder.</p>
21.	Water Resources Engineering	NCE-702	<p>CO-1 Apply the knowledge of hydrology in day to day life and utilize its basics for the measurement of precipitation.</p> <p>CO-2 Define and explain Infiltration, Evaporation and Transpiration and apply its knowledge to measure Infiltration and Interception</p> <p>CO-3 Utilize the Technique of the Hydrograph to forecast Flood discharge at various dura</p> <p>Apply the statistical technique to analyze the flood occurrence and frequency.</p> <p>CO-4 Discuss Geo- Hydrology term in exploration of ground water potential and to assess it using various techniques</p> <p>CO-5 Explain the concept of ground water recharge and multipurpose project for water resources.</p>
22.	Environmental Geo-technology	NCE-033	<p>CO-1 Understand composition, soil structure and its behavior</p> <p>CO-2 Identify contaminant transport mechanisms in soils</p> <p>CO-3 Specify site investigation techniques for characterization of contaminated site</p> <p>CO-4 Understand the principles of soil treatment techniques</p> <p>CO-5 design waste containment facilities</p>

  
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23.	Transportation Engineering-II	NCE-801	CO1 Understand the importance of railway infrastructure planning and design CO2 Identify the factors governing design of railway infrastructures CO3 Design and analyze the railway track system, Understand the process of execution of railway projects CO4 Fix the orientation of the runways, Carryout the geometrical design of the airport infrastructure CO5 Prepare structural designs of runway, taxiway, and apron-grate area, Prepare a plan of the airport terminal area, Prepare a plan of the sea port CO6 Provide solution to protect coastal erosion
24.	Analysis & Design of Hydraulic Structure	NCE-052	CO1 Understanding of the design of canal and its maintenance. CO2 To know the types of canal, distributaries, canal headworks, cross-drainage and canal regulator works. CO3 Understanding the various methods of analysis of canal. CO4 Application of the canal, dam and distributaries in civil engineering structures.
25.	Ground Improvement Technique	NCE-061	CO1: Analyze the field problems related to problematic soils and solve the problems using the ground Improvement techniques. CO2: Summarize and practice ground improvement using Mechanical modification techniques . CO3: Design drainage for seepage control, Assess dewatering field problems. CO4: Application of physical and chemical ground improvement techniques using thermal modification, like grouting, shotcreting and guniting technology. CO5: Demonstrate the ground improvement techniques such as ground anchors, rock bolting and soil nailing, Design of reinforced earth retaining structures.

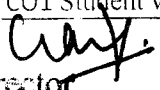
  
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**Department of Electronics & Communication Engineering**

S.N.	Subject Name	Sub Code	Course Outcomes
1	Entrepreneurship Development	NOE 071	<p>CO1 Students will able to have the understanding of the basic concepts in the area of entrepreneurship and to know the importance of various level of industries.</p> <p>CO2 Developing personal creativity in the field of entrepreneurship and taking entrepreneurial initiative.</p> <p>CO3 Adoption of the key steps in the elaboration of business idea.</p> <p>CO4 Understanding the stages of the entrepreneurial process and the resources needed for the successful development of entrepreneurial ventures.</p> <p>CO5 Understanding the importance of various acts and laws of entrepreneurship for economic development.</p>
2	Optical Communication	NEC 701	<p>CO1. Familiarize with basic concepts and theory of Optical Communication</p> <p>CO2. Demonstrate OPCOMM components, assemble them and solve problems on Optical Communication system</p> <p>CO3. Able to design, implements, analyse and maintains optical communication system</p> <p>CO4. Gain knowledge of different source of light as well as receiver and their comparative study</p> <p>CO5. To get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain</p>
3	Data Communication Networks	NEC 702B	<p>CO1 Identify the issues and challenges in the architecture of a N/w.</p> <p>CO2 Understand the ISO/OSI seven layers in a network.</p> <p>CO3 Realize protocols at different layers of a network hierarchy</p> <p>CO4 Recognize security issues in a network.</p>
4	VLSI Design	NEC703	<p>CO1 Model the behaviour of a MOS Transistor</p> <p>CO2 Design combinational and sequential circuits using CMOS gates</p> <p>CO3 Identify the sources of power dissipation in a CMOS circuit.</p> <p>CO4 Analyse SRAM cell and memory arrays</p>
5	Digital Image Processing	NEC 032	<p>CO1 Understand the need for image transforms and their properties.</p> <p>CO2 Choose appropriate technique for image enhancement both in spatial and frequency Domains.</p> <p>CO3 Identify causes for image degradation and apply restoration techniques.</p> <p>CO4 Compare the image compression techniques in spatial and frequency domains.</p> <p>CO5 Select feature extraction techniques for image analysis and recognition.</p>
6	NCER	NOE 081	<p>CO1 Understand the fundamentals and main characteristics of renewable energy sources and their differences compared to fossil fuels.</p> <p>CO2 Understand the extent of environmental impact and resource depletion of each of the major non-renewable and renewable sources of energy.</p> <p>CO3 Identify the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.</p> <p>CO4 Be able to apply this knowledge to suggest the preferred combination of sustainable solutions/actions to minimize the emission of greenhouse gases and increase sustainability of the energy system in specific areas/regions</p>

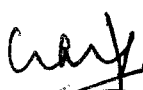
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7	Electronic Switching	NEC 041	CO1 Describe and apply fundamentals of telecommunication systems and associated technologies. CO2 Solve problems and design simple systems related to tele-traffic and trunking efficiency. CO3 Understand and explain the reasons for switching, and the relative merits of the possible switching modes, e.g. packet and circuit switching. CO4 Understand the principles of the internal design and operation of telecommunication switches, and the essence of the key signalling systems that are used in telecommunication networks.
8	Wireless & Mobile Communication	NEC 801	CO1 Explain the Classification of mobile communication systems CO2 Analyze the radio channel characteristics and the cellular principle CO3 Analyze the measures to increase the capacity in GSM systems- sectorization and Spatial Filtering for Interference Reduction CO4 Ability to analyze improved data services in cellular communication
9	Optical Network	NEC 802	CO1. To make students familiar with Optical Network. CO2. To choose system components. CO3. To identify the networks. CO4. To identify the WDM Network Design. CO5. As a prerequisite for the course in Wireless LANs Optical Switching
10	Integrated Circuits	REC501	CO1. Understand the basic building blocks of Integrated Circuit specially Op-Amp. CO2. Design & realize different types of filter using Op-Amp. CO3. Understand & Design basic logic gates under Digital Integrated Circuit Design. CO4. Understand the non linear applications of IC Op-Amp. CO5. Understand the functional architecture of IC 555 & IC 565.
11	Principles of Communication	REC502	CO1 Students will be able to understand the concept of communication system and the need for linear modulation techniques and its types CO2 Students will be demonstrated the theoretical background of angle modulation schemes, both modulation and demodulation CO3 Students will learn about important techniques like PAM, sampling theorem and various multiplexing schemes involved in any communication system CO4 Students will learn about various digital modulation techniques like PCM, delta modulation alongside with the basic concepts regarding the linear filtering of noise. CO5 Students will learn about the concept of signal to noise ratio, FoM and basic building of PLL.
12	Computer Architecture and Organization	REC-052	CO1 Study of the basic structure and operation of a digital computer system, Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floating point arithmetic operations CO2 Implementation of control unit techniques CO3 Understanding the hierarchical memory system, cache memories and virtual memory CO4 Understanding the different ways of communicating with I/O devices and standard I/O interfaces CO5 Understanding various architectural designs of computer system, analysis of various performance laws and implementation of the concept of Pipelining
13	Digital Signal	REC503	CO1 Student will be able to understand and realize different types

  
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	Processing		<p>of realizations of digital systems (IIR and FIR) and their utilities.</p> <p>CO2 Student will be able to formulate the design parameters of analog IIR digital filters (Butterworth and Chebyshev filters) and various methods such as impulse invariant transformation and bilinear transformation of conversion of analog to digital filters</p> <p>CO3 Student will be able to analyze different types of window functions used for the design of FIR filters.</p> <p>CO4 Student will be able to understand the principle of discrete Fourier transform &amp; its various properties and concept of circular and linear convolution. Also students will understand the concept of FFT i.e a fast computation method of DFT.</p> <p>CO5 Student will be able to understand the concept of decimation and interpolation. Also they will able to use it in various practical applications.</p>
14	Control System-I	RIC603	<p>CO1. Represent any system in any canonical form.</p> <p>CO2. Determine response of system</p> <p>CO3. Design Lead, Lag and Lead – lag compensator using frequency domain method or time domain method.</p> <p>CO4. Design PID compensator.</p>
15	Microwave Engineering	REC601	<p>CO1 To make students familier with field distribution and modes propagation</p> <p>CO2 Understanding different microwave devices</p> <p>CO3 Gain knowledge of different microwave tubes</p> <p>CO4 To get an idea of transferred electron devices and transit time devices</p> <p>CO5 Study different microwave measurement techniques</p>
16	Digital Communication	REC602	<p>CO1 Students will able to understand the basics of Digital Communication and various band-pass digital modulation schemes</p> <p>CO2 Students will gain knowledge about the use of probability in communication systems with basic introduction to random variables and their characteristics</p> <p>CO3 Students will be able to analyze the performance of digital receiver based on detection schemes employed and BER calculation</p> <p>CO4 Students will understand the concept related to spread spectrum technique, source coding, channel capacity, information theory and its basic advantage as compared to various conventional access schemes.</p> <p>CO5 Students will be able to conceptualize error detection &amp; correction using different coding schemes in digital communication.</p>
17	Microcontrollers for Embedded Systems	REC061	<p>CO1 Understand the architecture and programming of 8051 microcontroller,</p> <p>CO2 Understand the architecture and programming of MSP430 microcontroller.</p> <p>CO3 Interface peripherals to microcontrollers and design small applications,</p> <p>CO4 Understand the concept of IoT and related technologies and build IoT based applications.</p>
18	Network Analysis & Synthesis	REE305	<p>CO1 Apply the knowledge of basic circuitual law and simplify the network using reduction techniques.</p> <p>CO2 Analyse the circuit using Kirchhoff's law and Network simplification theorems.</p> <p>CO3 Evaluate two-port network parameters.</p> <p>CO4 Understand the behaviour of different circuits and their response using various circuit analysis tools and theorems.</p>

			CO5 Understand the concept of Network synthesis. CO6 Understand the graphical representation of electrical networks using graph theory.
19	Digital Logic Design	REC301	CO1 Aware of theory of Boolean algebra & the underlying features of various number systems. CO2 Apply the concepts of Boolean Algebra for the analysis & design of various combinational & sequential logic circuits. CO3 Design various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays.
20	Electronic Devices and Circuits	REC302	CO1 Understand the principles of semiconductor Physics and utilize the mathematical models of semiconductor junctions. CO2 Utilize the mathematical models of BJT and MOS transistors for circuits and systems. CO3 Utilize the mathematical models differential amplifiers circuits. CO4 Analyze and understand the different negative feedback circuits and oscillator circuits. CO5 Understand the various aspects of op-amp.
21	Signals and Systems	REC303	CO1 Analyze different types of signals. CO2 Analyze linear shift-invariant (LSI) systems. CO3 Represent continuous and discrete systems in time and frequency domain using Fourier series and transform. CO4 Analyze discrete time signals in z-domain. CO5 Study sampling and reconstruction of a signal.
22	Microprocessors & Microcontrollers	REC401	CO1 Explain the general structure of basic microprocessor 8085. CO2 Analyse and design programs for microprocessors using 8085. CO3 Interface peripheral devices with the microprocessors 8085. CO4 Understand the architecture and programming of MSP430 microcontroller. CO5 Interface peripherals to microcontrollers and design small applications.
23	Electromagnetic Field Theory (EMFT)	REC402	CO1 Apply different coordinate systems and their application in electromagnetic field theory, establish a relation between any two systems and also understand the vector calculus. CO2 Understand the concept of static electric field. Understand the concept of current and properties of conductors. Establish boundary conditions and to calculate capacitances of different types of capacitors. CO3 Understand the concept of static magnetic field, magnetic scalar and vector potential CO4 Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors. CO5 Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.
	Electronic Measurements & Instrumentation	REC403	CO1 To use the techniques and skills for electrical projects. CO2 Design a system, component or process to meet desired needs in electrical engineering. CO3 Measurement of R,L,C ,Voltage, Current, Power factor , Power, Energy CO4 Ability to balance Bridges to find unknown values. CO5 Ability to measure frequency, phase with Oscilloscope CO6 Ability to use Digital voltmeters CO7 Ability to measure strain, displacement, Velocity, Angular Velocity, temperature, Pressure ,Vacuum, and Flow

  
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**Department of Electrical Engineering**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Basic Electrical Engineering	KEE-101/ KEE-201	<p>CO 1: Apply the concepts of KVL/KCL and network theorems in solving DC circuits.</p> <p>CO 2: Analyze the steady state behavior of single phase and three phase AC electrical circuits.</p> <p>CO 3: Identify the application areas of a single phase two winding transformer as well as an auto transformer and calculate their efficiency. Also identify the connections of a three phase transformer.</p> <p>CO 4: Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.</p> <p>CO 5: Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.</p>
2.	Electrical & Electronics Engineering Materials	REE 301	<p>CO1: Analyze the dielectric strength of various type of materials, properties and its polarization.</p> <p>CO2: Understanding the magnetic behaviour of magnetic materials and its properties.</p> <p>CO3: Knowledge of semiconductor materials, properties and integration techniques.</p> <p>CO4: Understanding the materials used for electrical applications and also analyze the solid, liquid and gas insulating materials.</p> <p>CO5: Understanding various type of the special materials that have been used in different purposes.</p>
3.	Electrical Measurements & Instrumentation	REE-302	<p>CO 1: Evaluate error in measurement as well as identify and use different types of instruments for the measurement of voltage, current, power and energy.</p> <p>CO 2: Display the knowledge of measurement of electrical quantities resistance, inductance and capacitance with the help of bridges.</p> <p>CO 3: Demonstrate the working of instrument transformers as well as calculate the errors in current and potential transformers.</p> <p>CO 4: Manifest the working of electronics instruments like voltmeter, multimeter, frequency meter and CRO</p> <p>CO 5: Display the knowledge of transducers, their classifications and their applications for the measurement of physical quantities like motion, force, pressure temperature, flow and liquid level.</p>
4.	Basic Signal & Systems	REE-303	<p>CO 1: Represent the various types of signals &amp; systems and can perform mathematical operations on them.</p> <p>CO 2: Analyze the response of LTI system of Fourier series and Fourier transform and to evaluate their applications to network analysis</p> <p>CO 3: Analyze the properties of continuous time signals and system using Laplace transform and determine the response of linear system to known inputs.</p> <p>CO 4: Implement the concepts of Z transform to solve complex engineering problems using difference equations</p> <p>CO 5: Develop and analyze the concept of state-space models for SISO&amp; MIMO system.</p>

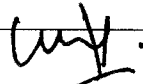
  
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5.	Analog & digital electronics	REC-309	<p>CO 1: Apply concepts of Analog circuits &amp; analyze power devices.</p> <p>CO 2: Analyze and design of amplifier circuits</p> <p>CO 3: Analyze and design of Oscillators circuit</p> <p>CO 4: Implementation of combinational logic circuits and sequential logic circuits.</p> <p>CO 5: Analyzed and design of Registers, Counters and memory circuits.</p>
6.	Network analysis & synthesis	REE-405	<p>CO 1: Apply the knowledge of basic circuit law nodal and mesh methods of circuit analysis and simplify the network using Graph Theory approach.</p> <p>CO 2: Analyze the AC and DC circuits using Kirchoff's law and Network simplification theorems.</p> <p>CO 3: Analyze steady-state responses and transient response of DC and AC circuits using classical and Laplace transform methods.</p> <p>CO 4: Demonstrate the concept of complex frequency and analyze the structure and function of one and two port network. Also evaluate and analysis two-port network parameters.</p> <p>CO 5: Synthesize one port network and analyze different filters.</p>
7.	Electromagnetic field theory	REC-402	<p>CO 1: Apply different coordinate systems and their application in electromagnetic field theory, establish a relation between any two systems and also understand the vector calculus.</p> <p>CO 2: Understand the concept of static electric field Understand the concept of current and properties of conductors. Establish boundary conditions and to calculate capacitances of different types of capacitors.</p> <p>CO 3: Understand the concept of static magnetic field, magnetic scalar and vector potential</p> <p>CO 4: Understand the forces due to magnetic field magnetization magnetic boundary conditions and inductors.</p> <p>CO 5: Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.</p>
8.	Power Plant Engineering	REE-401	<p>CO1:Familiarize with basic concepts of hydro-electric power plants.</p> <p>CO2:Familiarize with basic concepts of thermal steam power plants.</p> <p>CO3:Understanding the basic concepts related to the nuclear power plants.</p> <p>CO4:Discuss different types of renewable power plants for generation of electrical power.</p> <p>CO5:Study the combined operation of power plant in terms of power exchange, performance, operation and tariff structures.</p>
9.	Electrical Machines-I	REE-402	<p>CO 1: Analyze the various principles &amp; concepts involved in Electromechanical Energy conversion</p> <p>CO 2: Demonstrate the constructional details of DC machines as well as transformers, and principle of operation of brushless DC motor, Stepper and DC Servo motors.</p> <p>CO 3: Evaluate the performance and characteristics of DC Machine as motor and as well as generator.</p> <p>CO 4: Evaluate the performance of transformers,</p>

  
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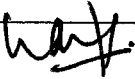
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			<p>individually and in parallel operation</p> <p>CO 5: Demonstrate and perform various connections of three phase transformers.</p>
10.	Control System	REE-503	<p>CO 1: By using mathematical modeling, block diagram reduction method, and signal flow graph to find transfer function of open loop and close loop control systems.</p> <p>CO 2: By using modern engineering techniques to find time response of first and second order systems and design different controllers also determine steady state errors and dynamic error constants for different test input signals.</p> <p>CO 3: By using simple algebra to find system stability by Routh Hurwitz criteria and by using modern techniques to find stability in time domain by Root locus method.</p> <p>CO 4: By using mathematical analysis and modern techniques to find stability in frequency domain by Polar plot, Nyquist plot and Bode's plot.</p> <p>CO 5: Study the concept of State-space model of physical system and Design compensators for control system to meet the desired needs within realistic constraints such as economic, manufacturability and sustainability.</p>
11.	Electrical Machines-II	REE-501	<p>CO 1: To understand fundamental concepts of construction, working principle and operation on infinite bus-bar of synchronous machine, and also determine voltage regulation of synchronous generator by various methods.</p> <p>CO 2: To understand the concepts of modeling of Cylindrical &amp; salient pole machine using two reaction theory, power flow equations and also learn starting method of synchronous motor with effect of excitation.</p> <p>CO 3: To study concepts of rotating magnetic field, construction, working principle, phasor diagram, equivalent circuit, torque slip characteristics of 3-phase induction motor and also learn testing of machine to determine efficiency and industrial applications of both induction motor and generator.</p> <p>CO 4: To study the different methods of starting and speed control of 3-phase induction motor and also learn effect of harmonics and phenomenon of Cogging and Crawling.</p> <p>CO 5: Study the construction and basic principle of 1-phase induction motor using double revolving field theory, general idea of equivalent circuit and different method of starting of 1-phase induction motor. also study the working principle of Reluctance, Repulsion, Universal, Stepper motor etc.</p>
12.	Power Transmission & Distribution	REE-502	<p>CO1: Familiarize the basic concepts of power system elements: circuit breaker, isolator, bus bar and single line diagram etc. Also study the supply system and transmission line related knowledge.</p> <p>CO2: Study the overhead transmission line in terms of calculation of inductance and capacitance for both single and three phase. Also study the types of transmission line and its performance.</p> <p>CO3: To analyse the formation of corona, corona loss and factors affecting corona and methods for reducing it. In addition, discuss the various type of insulators and evaluate the string efficiency of transmission line.</p> <p>CO4: To perform calculation for transmission line design. Also analyze the impact of wind and ice loading on it.</p>

  
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			Moreover, cable overview is also presented. CO5: Discuss various type of grounding and also study the basics of distribution system and its type.
13.	Power Electronics	REE-601	CO 1: Study the characteristics and specifications and types of a different power electronics devices and switches also learn operation of IGBT, SCR, GTO and TRIAC. CO 2: To understand principle and classification of choppers (DC-DC Converter) and also learn the phenomenon of commutation techniques, series and parallel operation of thyristors. CO 3: To study the working principle of 1-phase, 3-phase half wave & full wave bridge converter and duel converter. CO 4: To understand principle of 1-phase, 3-phase AC voltage controller and Cyclo-converter. CO 5: To study the working of 1-phase and 3-phase inverters with their practical applications.
14.	Microprocessor	REE-602	CO1: Introduction to Microprocessor and its applications, General Architecture of the Microprocessor and its operations, Component of Microprocessor system, Inputs-outputs (I/Os) and other Interfacing devices. CO2: Study 8-bit Microprocessor i.e. Intel 8085 Pin Diagram, Internal architecture: ALU, Registers, Timing and control unit. Also write the assembly language programs. CO3: Study 16-bit microprocessor i.e. Intel 8086 Architecture, Pin Diagram, Bus Interface Unit and Execution unit etc. Also discuss the Instruction set of 8086 and Interrupts. CO4: To understand the Fundamentals of Programming for microprocessor and also learn the Assembler Level Programming. CO5: To study the Peripheral Interfacing such as Programmed I/O, Memory Mapped I/O, Interrupt Driven I/O, DMA I/O interface. Along with this also discuss the Peripheral Devices such as DMA controller (Intel 8237), Programmable peripheral interface (Intel 8255), Programmable timer/counter (Intel 8253/8254), Programmable Interrupt Controller (Intel 8259).
15.	Power System Analysis	REE-603	CO 1: Perform modeling of power system components, its representation including the behavior of the constituent components and sub systems. CO 2: Analyze a network under both balanced and unbalanced fault condition to determine symmetrical & unsymmetrical faults and specify the rating circuit breaker. CO 3: Perform load flow analysis of an electrical power network and interpret the result of analysis. CO 4: Access the study state and transient stability of power system under various conditions also study the phenomenon of equal area criterion & Swing Equation. CO 5: Describe the concepts of travelling waves in transmission line and use the travelling wave theory to determine the over voltage caused by surge propagation in transmission network
16.	Special Electrical Machines	REE-064	CO1: To study the construction and working principle of poly phase machines and its characteristics. CO2: Basic introduction, operating principle, equivalent circuit and characteristics of Induction Generator. In addition also discuss the construction, characteristics,

  
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			<p>performance and applications of Two Phase AC Servomotors</p> <p>CO3: To study the operating principle, characteristics and application of stepper motors. Also discuss the Switched Reluctance Motors construction, operating principle and modes of operation.</p> <p>CO4: Familiarization with the Permanent Magnet Machines such as permanent magnet dc motors, sinusoidal PM A C motors, and brushless dc motors. Also study the Single phase synchronous motor construction, operating principle and characteristics.</p> <p>CO5: To study the concept of Single Phase Commutator Motors in terms of Construction, working principle, characteristics and its application.</p>
17.	Power Station Practice	NEE-702	<p>CO1: Familiarize with the basic concepts of thermal and hydro-electric power plants.</p> <p>CO2: To study the working and selection of different power plants such as nuclear power plant, Gas turbine plant and diesel power plants.</p> <p>CO3: Basic knowledge of substation layout and types of sub-stations. Also study the power plant economics and different methods of tariff.</p> <p>CO4: To study the economics, operation and characteristics of different power plant. Also study the load sharing of different power plant.</p> <p>CO5: To study the various non-conventional energy sources such as principals of MHD generation, solar power plant, wind energy, geothermal energy, tidal energy, ocean thermal energy.</p>
18.	Electric Drives	NEE-701	<p>CO 1: Understanding of the Fundamentals and concepts of Electric Drive.</p> <p>CO 2: understanding of steady state and transient stability of Electric drive and selection of motor power ratings.</p> <p>CO 3: knowledge of concept of electric braking and understanding of Drive dynamics during Starting and Braking.</p> <p>CO 4: Understanding of Power electronics control of DC and AC drives.</p>
19.	Analog & Digital Communication	NEC-702A	<p>CO1: Basic knowledge of amplitude modulation, its limitation, transmitter, receiver and multiplexing.</p> <p>CO2: Discussion on the Narrow band and wideband frequency modulation and also perform the noise calculation for AM and FM systems.</p> <p>CO3: Study the various types of modulations and waveform coding techniques.</p> <p>CO4: Discuss various Digital Modulation Techniques and its types. Also discusses the comparison between various digital techniques.</p> <p>CO5: To study the fundamentals of Time Division Multiplexing such as Electronic Commentator, Bit/byte interleaving etc. Also discusses the introduction for information theory</p>
20.	Flexible AC Transmission Systems	NEE-033	<p>CO 1: Introduction to terms and definitions of Power Quality.</p> <p>CO 2: Sources of voltage sag, estimating voltage sag performance and principle of its protection.</p> <p>CO 3: Understanding of various sources of Transient Over voltages and devices for its protection.</p>

			<p>CO 4: Introduction of various FACTS devices and their basic relationship for power flow control.</p> <p>CO 5: Causes of harmonics and their effects on Transformers, AC Motors, Capacitor Banks, Cables, and Protection Devices.</p> <p>CO 6: Familiarity with various harmonic Mitigation Techniques.</p>
21.	Electrical & Electronics Engineering Materials	NEE-801	<p>CO1: To study the material structure of crystal and its bonds. Also discuss the energy bands in solids and classification of materials using energy band.</p> <p>CO2: To study the conductivity of the material and factors affecting the conductivity. Also discuss the properties and application of metals.</p> <p>CO3: Familiarize the conduction in semiconductor materials. Also discuss the types of semiconductors and its properties.</p> <p>CO4: Discuss the various magnetic material such as Diamagnetism, Para-magnetism, Ferromagnetism, Anti-ferromagnetism and Ferrimagnetism etc. along with this also study the properties of magnetic materials, soft and hard magnetic materials, permanent magnetic materials.</p>
22.	Utilization of Electrical Energy and Traction	NEE-802	<p>CO 1: Awareness of electric heating, Resistance heating, Electric arc heating, Induction heating, and Dielectric heating.</p> <p>CO 2: Knowledge of electric welding.</p> <p>CO 3: Apply the Laws of illumination, design of indoor lighting and outdoor lighting systems.</p> <p>CO 4: Knowledge of Refrigeration systems, domestic refrigerator, water coolers and air conditioners.</p> <p>CO 5: Awareness of various electric traction systems and their control methodologies.</p>
23.	EHVAC & DC Transmission	NEE-041	<p>CO1: To study the basic introduction of EHV AC and HVDC transmission and comparison between them.</p> <p>CO2: Detailed discussion on EHV AC transmission in terms of corona, generation and characteristics corona pulses, radio interference etc.</p> <p>CO3: Familiarize about the testing of high voltage: Characteristics and generation of impulse voltage, generation of high AC and DC voltages, measurement of high voltage by sphere gaps and potential dividers. Also discuss the factors to design the EHV lines.</p> <p>CO4: To study the concept of EHV DC transmission and Principle of DC link control.</p> <p>CO5: Familiarize with the protection against various faults in EHV AC transmission. In addition, also discuss the Multi Terminal DC systems and its types.</p>
24.	NCER	NOE 081	<p>CO1: Understand the fundamentals and main characteristics of renewable energy sources and their differences compared to fossil fuels.</p> <p>CO2: Understand the extent of environmental impact and resource depletion of each of the major non-renewable and renewable sources of energy.</p> <p>CO3: Identify the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.</p> <p>CO4: Be able to apply this knowledge to suggest the preferred combination of sustainable solutions/actions to minimize the emission of greenhouse gases and increase</p>

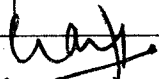
  
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sustainability of the energy system in specific areas/regions

**Department of Mechanical Engineering**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Material Science	RME-301	<p>CO 1: Analyze the Structure of materials at different levels, basic concepts of materials like defects in materials, miller indices etc.</p> <p>CO 2: Understand concept of mechanical behavior of materials and Analyze the basic concepts of crystalline materials like unit cell, FCC, BCC, HCP, APF (Atomic Packing Factor), Co-ordination Number etc.</p> <p>CO 3: Explain the concept of phase &amp; phase diagram &amp; understand the basic terminologies associated with metallurgy. Construction and identification of phase diagrams and reactions</p> <p>CO 4: Understand and suggest the heat treatment process &amp; types. Significance of properties Vs microstructure. Surface hardening &amp; its types. Introduce the concept of hardenability &amp; demonstrate the test used to find hardenability of steels</p> <p>CO 5: Explain features, classification, applications of newer class materials like smart materials, piezoelectric materials, biomaterials, composite materials etc</p>
2.	Thermodynamics	RME-302	<p>CO 1: TO Explain fundamental concepts of thermodynamics and apply the concept of first law of thermodynamics to open and closed systems.</p> <p>CO 2: TO Understand and apply the concept of second law of thermodynamics and entropy.</p> <p>CO 3: TO apply availability and irreversibility and thermodynamic relations.</p> <p>CO 4: To Use properties of pure substance and air-water vapour mixture and analyze the open and closed systems</p> <p>CO 5: To analyze air and vapour compression refrigeration systems.</p>
	Mechanics of Solid	RME-303	<p>CO 1: To enhance knowledge of mechanics of rigid bodies to the mechanics of deformable bodies by studying the concept of various stresses and theories of failure of simple and composite structure.</p> <p>CO 2: To analyze the concept of torsion and utilize the knowledge of stress and strain in lateral beams and study their deflection under various loading conditions and</p> <p>CO 3: To apply the knowledge of torsion for analyzing deflection and stresses in various types of spring and to understand the importance of buckling in slender members.</p> <p>CO 4: To analyze various stresses (radial, circumferential etc) in designing thin and thick pressure vessels and shell.</p> <p>CO 5: To analyze the stresses and deflection in curved or ring type structures and determine the stresses and deflection in unsymmetrical bending and shear centers of various sections.</p>
3.	Fluid Mechanics	RCE-303	<p>CO 1: Apply the basic equation of fluid statics to determine different forces and pressure on different surfaces that are submerged in a static fluid.</p> <p>CO 2: Apply the concepts of rotational vs. irrotational flows; stream functions, velocity potentials, sinks, sources, vortex flows, and superposition of these flows.</p> <p>CO 3: Determine flow rates, pressure changes, minor and major head losses for viscous flows through pipes, ducts,</p>

  
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			<p>simple networks.</p> <p>CO 4: Analysis the concepts of viscous boundary layers and the momentum integral and apply them to determine integral thicknesses, wall shear stresses, and skin friction coefficients.</p> <p>CO 5: Apply principles drag and lift to determine drag and lift forces at different conditions and apply of dimensional analysis and similitude to simple problems and use dimensionless parameters</p>
4.	Universal Human Values and Professional Ethics	RVE-301	<p>CO 1: Understand the significance of value inputs in a classroom and start applying in their life and profession.</p> <p>CO 2: Distinguish between values and skills, happiness and accumulation of physical facilities, the Self and the Body, Intention and Competence of an individual etc.</p> <p>CO 3: Understand the value of harmonious relationship based on trust and respect in their life and profession.</p> <p>CO 4: Understand the role of human being in ensuring harmony in society and nature.</p> <p>CO 5: Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.</p>
5.	Measurement and Metrology	RME 401	<p>CO 1: To develop competence in generalized measurement systems, sensors, transducers and terminating devises with associated parameters</p> <p>CO 2: To understand the concepts of time, strain &amp; pressure measurement systems and standards with regards to realistic applications.</p> <p>CO 3: Interpret the measurement of field variables like force, temperature, torque, vibration etc.</p> <p>CO 4: Understand the significance of standards of Metrology and its applications, use of comparators and CMM.</p> <p>CO 5: Comprehend the fundamentals of limits, Fits, tolerance, interferometry and surface texture</p>
6.	Manufacturing Science and Technology-I	RME-402	<p>CO 1: Understand the importance, concepts, classifications and applications of different manufacturing processes. Students will also get the broad knowledge of Sand casting process: moulding, pattern making, gating system, solidification and different types of metal shrinkages.</p> <p>CO 2: Design patterns, risers and gating system for casting of different metals and geometry. Students will also understand the concepts of special casting processes such as Die casting, investment casting, centrifugal casting, Continuous, CO2 casting. Causes and remedies of casting defects.</p> <p>CO 3: Design punch and die for punching and blanking operations. Students will also acquire basic operational knowledge of various sheet metal operations, dies and power presses, analyses of forming processes like cup/deep drawing and bending. Knowledge of Powder metallurgy process.</p> <p>CO 4: Analyze mechanics and force calculation requirements of different metal forming processes such as Forging, wire drawing, tube drawing, Extrusion and Rolling.</p> <p>CO 5: Categorize different unconventional metal forming processes based on energy sources. Principles used in Jig &amp; fixtures as well as manufacturing of plastic components</p>

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7.	Applied Thermodynamics	RME-403	<p>CO 1: Analyze the cycles of internal combustion engines in order to perform heat, work and efficiency calculations.</p> <p>CO 2: Analyze the various gas turbine plant system arrangements in order to perform heat, work, efficiency, air-fuel ratio, etc. calculations.</p> <p>CO 3: Analyze the basic, reheat and bled steam cycles in order to carry out calculations on system performance.</p> <p>CO 4: Construct steam turbine velocity diagrams in order to determine stage calculations mathematically and graphically.</p> <p>CO 5: Analyze the vapour compression refrigeration cycle in order to carry out calculations on system performance.</p>
8.	Machin Design-I	RME501	<p>CO 1: Students will have the knowledge of normal, shear, biaxial and tri axial stresses, Stress tensor, Principal Stresses, Stress-Strain diagrams, codes &amp; Standards, design considerations and Stress Analysis, static loads, theories of failures.</p> <p>CO 2: Students will be able to analyze different loading conditions such as static, fatigue and impact load. Design riveted joint under static and fluctuating loads.</p> <p>CO 3: Students will be able to design shafts under fluctuating and combined loads.</p> <p>CO 4: Students will be able to design different machine components such as Mechanical springs under static and fatigue loading.</p> <p>CO 5: Students will be able to design different machine components such as keys, couplings, power screws and screw jack under static and fatigue loading.</p>
9.	Heat and Mass Transfer	RME-502	<p>CO 1: To understand the different laws and mechanisms of different modes of heat transfer like conduction, convection and radiation &amp; to analyze the steady state conduction mode of heat transfer in one dimension.</p> <p>CO 2: To understand and analyze the need, application and performance evaluation of various types of fins.</p> <p>CO 3: To provide the knowledge on the principles of free and forced convection and analyze the Convection heat transfer coefficient in different convection environments.</p> <p>CO 4: To impart the knowledge &amp; to analyze the black body radiation and grey body radiation.</p> <p>CO 5: To learn about diffusion and convective mass transfer &amp; to understand the construction, Working and performance of different heat exchangers</p>
10.	Manufacturing Science II	RME-503	<p>CO 1: Understand the mechanism of metal cutting, chip formation, tool geometry and tool life.</p> <p>CO 2: Understand and analyze the different machining operations such as turning, milling, drilling and grinding.</p> <p>CO 3: Analyze the concepts of Limits, Fits, Tolerances, Surface Roughness and understand the concepts of welding and their different types.</p> <p>CO 4: Develop the knowledge of unconventional Machining with their importance, applications and working principle.</p>

  
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11.	I.C Engine & Compressor	RME-051	<p>CO 1: Students will demonstrate knowledge of the operating characteristics of common IC engines. Students will demonstrate the ability to perform a thermodynamic analysis of Otto, Diesel, and Dual cycle models.</p> <p>CO 2: Understand the mechanism behind fuel supply and the ignition systems in different types of engines.</p> <p>CO 3: Analyze different electronic fuel injection system, supercharging and its effect on performance of SI and CI engine.</p> <p>CO 4: Specify and interpret data of alternative fuels and its emission which effect the environment.To teach students methods to mitigate engine cooling and friction</p> <p>CO 5: Analyze different types of compressor and effect of various factors on performance of compressor.</p>
12.	Refrigeration & Air Conditioning	RME-061	<p>CO 1: To apply Various Refrigeration system and process cycles in aircraft refrigeration.</p> <p>CO 2: To apply the vapor compression refrigeration and its application in domestic appliances</p> <p>CO 3: To demonstrate the vapour absorption refrigeration system and properties of Refrigerant and their effects on environment</p> <p>CO 4: To apply psychometric properties and Air conditioning process</p> <p>CO 5: To design refrigeration equipment's.</p>
13.	Fluid Machinery	RME 601	<p>CO 1: Analyze the forces exerted by a jet of fluid on vanes of different shapes, either stationary or moving. To teach design principles of fluid machines and to use them in engineering applications.</p> <p>CO 2: Study and analyze the construction features and working principles of different classes of hydraulic turbines</p> <p>CO 3: Analyze the performance characteristic curves of hydraulic turbines.</p> <p>CO 4: Distinguish between different classes of pumps, their construction features and further analyze their performance. Understand the working principles of various hydraulic systems, hydraulic control systems and fluidics.</p>
14.	Theory of Machines	RME6 02	<p>CO 1: The students will be able to analyze the mobility, velocity and acceleration of the complex linkages gears and cams.</p> <p>CO 2: The students will be proficient in the use of mathematical methods to analyze the forces and motion of complex systems of linkages, gears and cams.</p> <p>CO 3: The Student will be able to analyze the static and the dynamical forces acting on mechanical systems composed of rotating and reciprocating masses.</p> <p>CO 4: The Students will be able to balance the balance the rotating as well as reciprocating masses.</p> <p>CO 5: The Students will be able to determine the forces and power calculations of the brakes and dynamometer and to understand the principles of governor.</p>

  
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15.	MACHINE DESIGN II	RME-603	<p>CO 1: Identification and detailed design procedures of different I C engine parts with suitable material type and manufacturing process.</p> <p>CO 2: Basic understanding of gear geometry and design procedures for spur and helical gears based on beam and wear strength.</p> <p>CO 3: Understand the design principles of design of bevel and worm gear system with terminology and force analysis along with practical applicability.</p> <p>CO 4: Ability to design sliding contact bearings to meet desired needs within realistic constraints such as economic, environmental, health and safety, manufacturability, and sustainability.</p> <p>CO 5: Basics definitions of design parameters of rolling contact bearings and selection method for rolling contact bearings.</p>
16.	Total Quality Management	NME041	<p>CO 1: To gain the knowledge about the quality concepts applied in small to large scale organizations and development of sources for manufacturing.</p> <p>CO 2: To learn about organization functioning, economics, motivation, team work and implementation of these tools.</p> <p>CO 3: To learn about organization functioning, economics, motivation, team work and implementation of these tools.</p> <p>CO 4: To have the knowledge about defects diagnosis or complexity and prevention to develop a reliable process and product.</p> <p>CO 5: To have the knowledge about International standard organization (ISO) tools and its importance for an organization along with auditing and optimization techniques.</p>
17.	Entrepreneurship Development	NOE-071	<p>CO 1: Students will able to have the understanding of the basic concepts in the area of entrepreneurship and to know the importance of various level of industries.</p> <p>CO 2: Developing personal creativity in the field of entrepreneurship and taking entrepreneurial initiative.</p> <p>CO 3: Adoption of the key steps in the elaboration of business idea.</p> <p>CO 4: Understanding the stages of the entrepreneurial process and the resources needed for the successful development of entrepreneurial ventures.</p> <p>CO 5: Understanding the importance of various acts and laws of entrepreneurship for economic development.</p>
18.	Computer Aided Manufacturing	NME 031	<p>CO 1: Understand the concept of automation: need, types, elements, levels, strategies and application of automation in different types of production system.</p> <p>CO 2: Understand the fundamentals of Numerical control (NC) machine tools such as elements, classification, axes, construction details, MCU and methods of improving accuracy using NC.</p> <p>CO 3: Acquire the fundamental operational knowledge of CNC, DNC, Adaptive control as well as knowledge of system devices such as drives, feedback devices and control systems.</p> <p>CO 4: Create and run CNC manual part programme (based on FANUC Controller) in word address format for Milling, drilling and Turning operations as well as able to generate part programme using computer assisted part programming using APT lang.</p> <p>CO 5: Understand the concepts of CIM, GT, FMS, CAPP as well as get the basic knowledge of types, generation and</p>

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			applications of Robots
19.	Computer Aided Design	NME701	CO 1: To utilize the knowledge of computer hardware/software for understanding the modern designing process. CO 2: To understand the concept of drawing basic shapes and their transformation for analyzing designs. CO 3: To understand the mathematical tools and equations associated with designing CO 4: To simulate the technical knowledge of solid mechanics for analyzing the designs. CO 5: To understand the design with the aid of new technology, soft-wares etc.
20.	Automobile Engg	NME-702	CO 1: To design and analysis of main components and gear boxes. CO 2: To study and design power transmission system. CO 3: To study and analysis of braking system. CO 4: To study the electrical components and fuel supply system. CO 5: To study Emission standards and Alternative Energy Sources
21.	Non-Destructive Testing	NME-065	CO 1: Familiarize with the different characterization techniques to check the Competency of materials used for particular application CO 2: To understand the basic principles of LPI & MPI and to identifying different flaws/defects. CO 3: To provide knowledge Radiographic inspection and able to identify suitability of RT for the material inspection. CO 4: To introduce ultrasonic testing and provide a sound theoretical knowledge and practical knowledge for Ultrasonic testing with wide range of case studies. CO 5: Describe the basic principles of the eddy current test method and Provide knowledge of types of discontinuities detected with the eddy current test method with case study.
22.	Advanced Welding Technology	NME-055	CO 1: Understand various parameters and requirements for welding processes CO 2: Understand comparative merits and demerits of various welding processes along with their procedures CO 3: Understand thermal and metallurgical considerations in welding CO 4: Understand classification of weld defects and testing of welds CO 5: Understand about the joint designs adopted in different types of welding techniques
23.	Operation Research	NME-051	CO 1: To Understand how to formulate a real-world problem into a mathematical models. CO 2: To understand design and analysis of models. CO 3: To Select an optimum solution with profit maximization. CO 4: To solve larger problems, communicate technical knowledge, partition a problem into smaller tasks, and complete tasks on time. CO 5: To explain and analyse various network problems using graph optimization techniques.

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24.	Power Plant Engg	NME-801	<p>CO 1: Basic knowledge of Different types of Power Plants, site selection criteria of each one of them.</p> <p>CO 2: Understanding of Thermal Power Plant Operation, turbine governing, different types of high pressure boilers including supercritical and supercharged boilers, Fluidized bed combustion systems.</p> <p>CO 3: Design of chimney in thermal power plants, knowledge of cooling tower operation, numerical on surface condenser design.</p> <p>CO 4: Basic knowledge of Different types of Nuclear power plants including Pressurized water reactor, Boiling water reactor, gas cooled reactor, liquid metal fast breeder reactor.</p> <p>CO 5: Understanding of Power Plant Economics, Energy Storage including compressed air energy and pumped hydro etc.</p> <p>CO 6: Discussing environmental and safety aspects of power plant operation</p>
25.	Non-Conventional Energy Resources, Course Code	NME-081	<p>CO 1: Create awareness among students about Non-Conventional sources of energy technologies and applications</p> <p>CO 2: Enable students to understand various renewable energy technologies and systems</p> <p>CO 3: To impart the knowledge of storage technologies from the autonomous renewable energy sources</p> <p>CO 4: Equip the students with knowledge and understanding of various possible mechanism about renewable energy projects</p> <p>CO 5: To explain and analyze different clean mechanisms for a sustainable future and for securing limited conventional fuels</p>

*Ans.*

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## **MBA**

### **Program Educational Objectives**

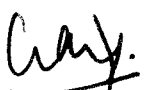
- PEO 1:** To prepare students for successful careers in industry that meet the needs of Indian and multinational companies.
- PEO 2:** To develop the ability among students to synthesize data and technical concepts for application to product design.
- PEO 3:** To provide opportunity for students to work as part of teams on multidisciplinary projects.
- PEO 4:** To provide students with a sound foundation in the mathematical, scientific and engineering fundamentals necessary to formulate, solve and analyze engineering problems and to prepare them for graduate studies.
- PEO 5:** To promote student awareness of the life-long learning and to introduce them to professional ethics and codes of professional practice.

### **Program Outcomes**

- PO1:** Cross-Disciplinary Integration and Strategic Perspective: Conceptualize, organize and resolve complex business problems or issues by using the resources available under their discretion.
- PO2:** Critical Thinking and Problem Solving: Apply the perspective of their chosen specialized area of study to develop fully-reasoned opinions on such contemporary issues as the need for integrity, leading and managing change, globalization and technology management.
- PO3:** Teamwork: Able to determine the effectiveness with which goals are defined and achieved in team environments to assess the contributions made by themselves as well as by their peers within those environments and to identify and resolve conflicts.
- PO4:** Leadership Skills: Able to document their participation and contribution to student organizations, business or consulting projects, internship opportunities or other MBA sanctioned initiatives.
- PO5:** Modern Tool Usage: Create, select, and apply appropriate techniques, resources and modern management and IT tools including prediction and modeling to complex management activities with an understanding of the limitations.
- PO6:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the management practice.
- PO7:** Environment and Sustainability: Understand the impact of the professional management solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
- PO8:** Entrepreneurial Perspective: Able to identify, assess and shape entrepreneurial opportunities and to evaluate their potential for business success.
- PO9:** Global Perspective: Able to demonstrate their ability to assess and evaluate the dynamic internal and external elements of the competitive global environment.

### **Program Specific Outcomes**

- PSOs 1** The graduates would have imbibed all the basic principles of Management. The graduates would have adequate theoretical knowledge on various core disciplines of management science.
- PSOs 2** The graduates would be able to consolidate the thus acquired knowledge into practical skills.
- PSOs 3** Helped in designing with the objective of developing young men and women into highly adept professional managers.
- PSOs 4** Empowers students to demonstrate the ability to innovate, the ability to execute the most daunting of challenges in the most trying of circumstances.

  
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PSOs 5 Through value based education and training and would also discharge his/her social responsibility to the community at large.

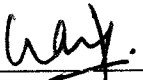
**Course Outcomes**

S.N.	Subject Name	Subject Code	Course Outcomes
1.	Management Concepts and Application	RMB101	CO 1: The concept of management and its managerial perspective. CO2: The Subject will equip students to map complex managerial aspect arise due to ground realities of an organization. CO3: They will gain knowledge of contemporary issues in management principles and various approaches to resolve those issues.
2.	Managerial Economics	RMB102	CO1: This course would provide students with the knowledge, tools and techniques to make effective economic decisions under conditions of risk and uncertainty CO2: Micro economic principles would equip the students with tools and principles which are applied for analyzing the ever changing demand and supply conditions CO3: The students would be able to apply the basic macroeconomic concepts to analyze the volatility in the business world.
3.	Financial Accounting for Managers	RMB 103	CO1: Subject will provide an insight to the concepts and principles for their routine monetary transaction. CO2: Prepare financial statements in accordance with Generally Accepted Accounting Principles and its excel application. CO3: Employ critical thinking skills to analyze financial data as well as the effects of differing financial accounting methods on the financial statements. CO4: Effectively define the needs of the various users of accounting data and demonstrate the ability to communicate such data effectively, as well as the ability to provide knowledgeable recommendations. CO5: Recognize circumstances providing for increased exposure to fraud and define preventative internal control measures.
4.	Business Statistics	RMB104	CO1: Students should be able to calculate and interpret measures of central tendency, symmetrical and asymmetrical distribution. patterns. CO2: To estimate the time series analysis by least square method and to calculate, understand the significance and usage of index number. CO3: To calculate and interpret correlation coefficients & Formulate regression line by identifying dependent and independent variables. CO4: Students should understand basic concepts of probability and perform probability theoretical distributions. CO5: Understand Estimation Theory and to develop understanding of hypothesis testing concepts & perform various parametric and non-parametric tests.
5.	Organizational Behaviour	RMB105	CO1: Analyze the behaviour of individuals and groups in organizations CO2: Assess the potential effects of organisational-level factors (such as structure, culture and change) on organizational behaviour.

  
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			<p>CO3: Critically evaluate the potential effects of important developments in the external environment (such as globalization and advances in technology) on organizational behaviour.</p> <p>CO4: Analyze organizational behavioural issues in the context of organizational behaviour theories</p>
6.	Marketing Management	RMB 106	<p>Course Outcomes: Upon the successful completion of this course, the student will be able to</p> <p>CO1: Explain and discuss the general concepts about marketing management and the marketing process.</p> <p>CO2: Discuss consumer and buyer behaviour models as they influence customer purchase decision-making.</p> <p>CO3: Explain the concepts of segmentation, targeting and positioning as part of a comprehensive Marketing plan.</p> <p>CO4: Develop a set of skills important to successful performance in marketing management positions, including critical thinking, working in a group environment, oral and written presentation skills.</p> <p>CO5: Explain the prospect of the global market and application of digitalization to reach there.</p>
7.	Business Communication	RMB107	<p>CO1: Apply business communication strategies and principles to prepare effective communication for domestic and international business situations.</p> <p>CO2: Identify ethical, legal, cultural, and global issues affecting business communication.</p> <p>CO3: Utilize analytical and problem solving skills appropriate to business communication.</p> <p>CO4: Participate in team activities that lead to the development of collaborative work skills.</p> <p>CO5: Select appropriate organizational formats and channels used in developing and presenting business messages.</p> <p>CO6: Compose and revise accurate business documents using computer technology.</p> <p>CO7: Communicate via electronic mail, Internet, and other technologies.</p> <p>CO8: Deliver an effective oral business presentation.</p>
8.	Computer Applications and Management Information System	RMB108	<p>CO1: Have an in-depth knowledge of IT enabled competitive advantage and organizational change.</p> <p>CO2: Grasp essential of major components of Information technology and various information systems.</p> <p>CO3: Become familiar in the use of tools such as Excel, Word and power point for modelling and solving Business problems.</p> <p>CO4: Become familiar about the design and implementation issues related to the development of information systems for Business applications.</p>
9.	Business Environment	RMB 201	<p>CO1: Demonstrate an understanding of the forces that shape the business and economic structure</p> <p>CO2: Explain why business ethics is an integral part of every business organization.</p> <p>CO3: Understand the business and related factors; and business's dependency on the interactions with different environmental variables.</p> <p>CO4: Develop analytical skills and widen the understanding of macro environmental issues by applying the knowledge of macroeconomic policies and their impact on business organization and strategy.</p>

  
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10.	Human Resource Management	RMB202	<p>CO1: Synthesize the role of human resources management as it supports the success of the organization including the effective development of human capital as an agent for organizational change.</p> <p>CO2: Demonstrate knowledge of laws that impact behaviour in relationships between employers and employees that ultimately impact the goals and strategies of the organization.</p> <p>CO3: Understand the role of employee benefits and compensation as a critical component of employee performance, productivity and organizational effectiveness.</p> <p>CO4: Show evidence of the ability to analyze, manage and problem solve to deal with the challenges and complexities of the practice of collective bargaining.</p> <p>CO5: Demonstrate knowledge of practical application of training and employee development as it impacts organizational strategy and competitive advantage.</p>
11.	Business Research Methods	RMB 203	<p>CO1: Reader can clearly differentiate Research and management problem.</p> <p>CO2: Students can have confident in making their own research proposal.</p> <p>CO3: Students would have a strong knowledge in preparing well structured questionnaire in all respect.</p> <p>CO4: Students would have not only theoretical/conceptual but also the knowledge in working with statistical packages.</p> <p>CO5: Reader would get the skill to convert the research into presentable article.</p>
12.	Financial Management	RMB 204	<p>CO1: Apply techniques to project financial statements for forecasting long-term financial needs.</p> <p>CO2: Explain the role of short-term financial management, and the key strategies and techniques used to manage cash, marketable securities, accounts receivable and inventory.</p> <p>CO3: Apply future value and present value concepts to single sums, mixed streams, and annuities.</p> <p>CO4: Identify relevant cash flows for capital budgeting projects and apply various methods to analyze projects.</p> <p>CO5: Apply techniques for estimating the cost of each component of the cost of capital and understand how to assemble this information into a cost of capital and Capital structure.</p> <p>CO6: Explain the concept of leverage and the benefits and costs associated with debt financing.</p> <p>CO7: Apply techniques of dividend and retention ratio.</p>
13.	Management Accounting and Control	RMB 205	<p>CO1: Demonstrate an understanding of the context within which Management Accounting is used for planning and control purposes.</p> <p>CO2: Appreciate how budgets and variances are used to control and measure performance.</p> <p>CO3: Understand the use of various costing systems and techniques</p> <p>CO4: Measure and analyse performance using appropriate variances.</p> <p>CO5: Prepare cost estimates using appropriate assumptions.</p> <p>CO6: Appreciate the impact on management information of using different costing systems and techniques.</p>
14.	Production Operations and Supply Chain Management	RMB 206	<p>CO1: Students will improve upon their conceptual skills, understanding and application of tools and techniques of operations management in business practices in real time.</p>

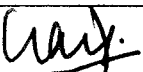
  
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			<p>CO2: Students will develop understanding and application of factors in the design of effective operating systems.</p> <p>CO3: Students will understand the concept of TQM perspectives.</p> <p>CO4: Students will understand the concepts of Material Management and Supply Chain Management.</p>
15.	Quantitative Techniques for Manager	RMB 207	<p>CO1: Be able to understand the characteristics of different types of decision-making environments and the appropriate decision making approaches and tools to be used in each type.</p> <p>CO2: To formulate linear programming problem and to find optimal solution by graphical simplex method</p> <p>CO3: Be able to build and solve Transportation Models and Assignment Models also to solve game theory problems by understanding pure and mix strategies.</p> <p>CO4: To assign optimal sequence of difference jobs on different machines and develop understanding of queuing theory concepts.</p> <p>CO5: To implement replacement of equipment's at right time and able to implement project management concepts like CPM, PERT to reduce cost and time.</p>
16.	Legal Aspects of Business	RMB 208	<p>CO1: Acquire a sound understanding of the legal aspects of the law affecting businesses</p> <p>CO2: Explain the principles of Indian Business Law and Company Law</p> <p>CO3: Develop reasoning abilities by applying the principles of law in the business environment</p> <p>CO4: Appraise the legal environment of the organization and develop suitable strategies.</p> <p>CO5: Analyse a given business context using basic understanding of the applicable Acts and develop a suitable operational framework.</p>
17.	Strategic Management	RMB301	<p>CO1: Formulate organizational vision, mission, goals, and values.</p> <p>CO2: Develop strategies and action plans to achieve an organization's vision, mission, and goals.</p> <p>CO3: Develop powers of managerial judgment, how to assess business risk, and improve ability to make sound decisions and achieve effective outcomes.</p> <p>CO4: Evaluate and revise programs and procedures in order to achieve organizational goals.</p> <p>CO5: Consider the ethical dimensions of the strategic management process.</p>
18.	International Business Management	RMB302	<p>CO1: Get an overview of the key issues and concepts of International Business</p> <p>CO2: Understand how and why the world's countries differ.</p> <p>CO3: Understand the monetary framework in which international business transactions are conducted</p> <p>CO4: Understand the role of International Organizations and Regional Trade blocks</p> <p>CO5: Implement the decisions for international operations in a superior manner</p>
19.	Corporate Governance, Values & Ethics	RMB 401	<p>CO1: Have an insights into various concepts &amp; cases related to Corporate Governance.</p> <p>CO2: Gain a deeper understanding of the various aspects, factors related to role of ethics in Business.</p>

  
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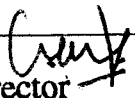
20.	Entrepreneurship Development	RMB402	<p>CO1: There will be ability to understand the context of entrepreneurial activities so as to undertake them in due course of time.</p> <p>CO2: There will be ability to focus on key strengths and potentials that students can convert into entrepreneurial competencies for their future careers.</p> <p>CO3: They shall be able to identify future business opportunities indifferent business environments and plan a business process.</p> <p>CO4: They will be able to identify and seek help from different levels and types of state and national level agencies.</p> <p>CO5: They will be able to apply their entrepreneurial capabilities in the SME sector, deploy knowledge of venture capital financing and exposure to international entrepreneurial opportunities.</p>
21.	Talent Management	RMB HR01	<p>CO1: Knowledge of Talent Management Processes.</p> <p>CO2: Understanding for analysis of the impacts of Talent management in the Organization</p> <p>CO3: Competency to implement Talent Management practices.</p> <p>CO4: Competency to develop leadership qualities among subordinate.</p> <p>CO5: Knowledge about the reward system to support Talent management</p>
22.	Performance and Reward Management	RMB HR02	<p>CO1: Students will be able to explain the concept of performance management system and its relevance in the organization.</p> <p>CO2: They have the ability to explain the different methods adopted by the organizations and different methods used for different level of employees.</p> <p>CO3: They have the ability to explain the relevance of competency mapping and understanding its linkage with career development.</p> <p>CO4: Students will be able to explain how to prepare pay roll on excel and also various aspects of compensation system in India.</p>
23.	Industrial Relations and Labour Laws	RMB HR03	<p>CO1: Knowledge of Industrial Relation framework</p> <p>CO2: Competency to understand the importance of Employee Relation within the perspective of Industrial Relation</p> <p>CO3: Knowledge about relevant Laws of HR management</p> <p>CO4: Competency to interpreted and implement the Labor Laws within Organization</p> <p>CO5: Competency to use Collective Bargaining and Grievance redressal Mechanism</p>
24.	Training & Development	RMB HR04	<p>CO1: The field of Training and Development and its role in optimizing performance.</p> <p>CO2: Applying theoretical concepts and models to training design.</p> <p>CO3: Designing training interventions using a variety of methodologies.</p> <p>CO4: Evaluating the effectiveness of training &amp; development interventions.</p> <p>CO5: Assessing whether training &amp; development is a viable career option.</p>
25.	Negotiation & Conflict Management	RMB HR05	<p>CO1: Understanding the central concepts of negotiation and conflict.</p>

  
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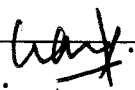
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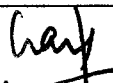
			<p>CO2: Providing experience in the negotiation and conflict management process.</p> <p>CO3: Effectively diagnosing and planning for different types of negotiation situations.</p> <p>CO4: Developing negotiating skills and confidence in a variety of contexts.</p>
26.	Sales and Distribution Management	RMB MK01	<p>CO1: Students will develop the skills in Sales force management and Distribution Channel management.</p> <p>CO2: Acquainted with better understanding of implementation of Sales and Channel management strategies.</p> <p>CO3: Develop analytical skills for effective decision alternatives in Sales and Channel management problems.</p>
27.	Consumer Behaviour	RMB MK02	<p>CO1: Understand the three major influences on customer choice; the process of human decision making in a marketing context; the individual customers make up; the environment in which the customer is embedded;</p> <p>CO2: Develop the cognitive skills to enable the application of the above knowledge to marketing decision making and activities</p> <p>CO3: Be able to demonstrate how concepts may be applied to marketing strategy</p>
28.	Digital Marketing	RMB MK03	<p>CO1: It will develop proficiency in interpreting marketing strategies in the digital age and provide fundamental knowledge for working in an online team.</p> <p>CO2: It will enable them to develop various online marketing strategies for various marketing-mix measures.</p> <p>CO3: It will guide them to use various digital marketing channels for consumer acquisition and engagement.</p> <p>CO4: It will help in evaluating the productivity of digital marketing channels for business success.</p> <p>CO5: it will prepare candidates for global exposure of digital marketing practices to make them employable in a high growth industry.</p>
29.	Marketing of Services	RMB MK04	<p>CO1: Understand and explain the nature and scope of services marketing</p> <p>CO2: Use critical analysis to perceive service shortcomings in reference to ingredients to create service excellence;</p> <p>CO3: Be able to identify critical issues related to service design, such as identifying and managing customer service experience, expectations, perceptions and outcomes</p> <p>CO4: Provide a theoretical and practical basis for assessing service performance using company examples; Identify and discuss characteristics and challenges of managing service firms in the modern world</p> <p>CO5: Discuss key linkages between marketing and other business functions in the context of designing and operating an effective service system.</p>
30.	Integarated Marketing Communications	RMB MK05	<p>CO1: Apply an IMC approach in the development of an overall advertising and promotional plan able to prepare marketing communication budget.</p> <p>CO2: Enhance creativity, critical thinking and analytical ability through developing an integrated marketing communication campaign</p> <p>CO3: Create an advertising strategy that employs an appropriate message objectives.</p> <p>CO4: Develop insights into the characteristics of different forms of marketing communications such as advertising,</p>

  
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			sales promotions, public relations, point-of-purchase communications.
31.	Security Analysis & Portfolio Management	RMB FM01	CO1: Value assets such as stocks and bonds. CO2: Manage investment portfolios. CO3: Optimally diversify portfolios. CO4: Allocate investments into stock and bond portfolios in accordance with a person's risk preferences. CO5: Measure the riskiness of a stock or a portfolio position. CO6: Adjust the value of an asset to take into account the riskiness of the asset. CO7: Understand and critically evaluate investment advice from brokers and the financial press.
32.	Tax Planning & Management	RMB FM02	CO1: After completing this course , the scope of tax planning concerning various business and managerial and strategic activities can be explored CO2: Understand and critically evaluate their Tax and Tax planning CO3: Understand how Excise and Custom tax can be calculated. CO4: Measure Corporate Tax and Taxation in case of business restructuring CO5: Have knowledge about various Tax Dates, Rates and Forms.
33.	Financial Market and Commercial Banking	RMB FM03	CO1: The student will able to know about the functioning and working of various financial institutions in India thus in turn connecting it to the working of Indian economy. CO2: Student will be able to gain knowledge about the working of various financial instruments in the primary and secondary market in India as well as foreign market. CO3: Student will be able to gain knowledge about the banking industry and working of its various products.
34.	Working Capital Management	RMB FM04	CO1: Evaluate comparative working capital management policies and their impact on the firm's profitability, liquidity, risk and operating flexibility. CO2: Evaluate the importance of effective working capital management and its role in meeting the firm's strategic objectives and its impact in value creation. CO3: Investigate funds flow cycles and their impact on working capital management objectives. CO4: Compare and contrast the relative merits of alternative working capital policies and the likely short-term and long-term impact on the firm. CO5: Formulate appropriate working capital management policies to achieve corporate objectives. CO6: Apply corporate cash management, accounts receivable management, bank relations, and inventory management techniques to maximize the share holders' value. CO7: Write a plan for a balanced integration of cash, credit and other short-term topics and policies. CO8: Formulate and integrate an extended treatment on international working capital topics.
35.	Financial Derivatives	RMB FM05	CO1: Understand how derivative securities work and how they are traded. CO2: Understand the principles of derivatives pricing, including the implications of arbitrage. CO3: Be able to price forward and futures contracts using the

  
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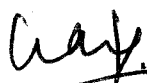
			<p>cost of carry model.</p> <p>CO4: Be able to value options using the binomial and Black-Scholes option pricing models.</p> <p>CO5: Be prepared to use futures and options in financial risk management, speculation and arbitrage.</p> <p>CO6: Learn important lessons from derivatives disasters.</p>
36.	International Marketing	RMB IB01	<p>CO1: Identify and analyse opportunities within international marketing environments.</p> <p>CO2: Undertake strategic business analysis in order to develop appropriate international marketing objectives and strategies.</p> <p>CO3: Identify, analyse, and evaluate information, and evidence related to international business opportunities and threats relevant in the current world.</p> <p>CO4: Develop proper product and pricing decisions in a particular target market.</p> <p>CO5: Understand process of international marketing communication strategies and adapting to specific market needs.</p>
37.	International Logistics	RMB IB02	<p>CO1: To view logistics as more than an operational function that passively executes a plan, but as a strategic function that creates value and competitive advantage</p> <p>CO2: Develop in the right way the process of organizing and conducting the proceedings relating to the transport and shipping.</p> <p>CO3: Able to carry basic assessment of freight and ports work environment.</p> <p>CO4: The use and impact of e-commerce in logistics</p>
38.	Export Import Documentation	RMB IB03	<p>CO1: Upon successful completion of this course, the student will be able to.</p> <p>CO2: Demonstrate an understanding of the forces that shape the export and import.</p> <p>CO3: Explain why business ethics is an integral part of every export and import.</p> <p>CO4: Understand the business and related factors; and business's dependency on the interactions with different capital goods.</p>
39.	Trading Block & Foreign Trade Frame Work	RMB IB04	<p>CO1: Demonstrate an understanding of the forces that shape the international trades and blocks</p> <p>CO2: Explain why business ethics is an integral part of every international trade.</p> <p>CO3: Understand the business and related factors; and business's dependency on the interactions with different international groups</p>
40.	Cross Cultural Management-	RMB IB05	<p>CO1: Present an overview and analyze different meanings and dimensions of "culture".</p> <p>CO2: Describe and analyze the impact of culture on business practices.</p> <p>CO3: Explain and analyze the impact of national culture on organizational cultures.</p> <p>CO4: Understand the impact of culture on Human Resource Management.</p> <p>CO5: Explain how leadership differs across cultures.</p>
41.	Enterprise Resource Planning	RMB IT01	<p>CO1: The student should be able to have a clear and relevant understanding of the definitions, importance, potential business values and relevant technologies of ERP Systems.</p>

  
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			CO2: The students should be able to analyze important issues in implementing an ERP system in an organization.
42.	Web Technology And E- Commerce	RMB IT02	CO1: Understanding the nature of Web Technology CO2: Exploring the business potential of Web Technology CO3: Planning and executing the web based business application CO4: Knowledge about the Information and Web Security CO5: Knowledge about the functioning of online payment systems
43.	Cloud Computing for Business	RMB IT03	CO1: The student will be able to assess various cloud characteristics and service attributes, for compliance with enterprise objectives. CO2: The student will be able to recognize security threat exposure within a cloud computing infrastructure. CO3: Student will be able identify various cloud services.
44.	Database Management Systems	RMB IT04	CO1: The student will be able explain about the various types of database Models CO2: The student gains knowledge about the working of relational model with the help of various SQL queries CO3: The conceptual knowledge of remote data access, data warehousing and mining helps the student understand more about working pattern of Industries.
45.	System Analysis & Design	RMB IT05	CO1: The student will be able to know the various phases of making of information systems. CO2: To take various steps to protect the system from threats which can cause serious damage.
46.	Supply Chain Management	RMB OP01	CO1: Apply the basic framework of Supply Chain Management and basic concepts in logistics, distribution, warehousing. CO2: Understand the roles of supply chain among various business functions and their roles in the organizations' strategic planning and gaining competitive advantage. CO3: Analyze inventory management methodologies and evaluate and select transportation modes. CO4: Interpret the procurement and outsourcing decisions and prepare the supplier selection. Assess the strategic role and impact of IT technologies on supply chain integration.
47.	Materials Management	RMB OP02	CO1:It will help in understanding the fundamentals of production planning and profit considerations. CO2:It will provide quantitative knowledge and capability to use various product/process planning tools. CO3: It will enable them to devise appropriate strategies concerning aggregate panning and cost. CO4. It help in resolving complex scheduling issues by way of implementing standard scheduling procedures. CO5: It will enhance exposure to recent trends in production planning and control and increase adaptability with latest global-production practices.
48.	Production Planning & Control	RMB OP03	CO1: It will help in understanding the fundamentals of production planning and profit considerations. CO2: It will provide quantitative knowledge and capability to use various product/process planning tools. CO3: It will enable them to devise appropriate strategies concerning aggregate panning and cost. CO4: It help in resolving complex scheduling issues by way

  
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			of implementing standard scheduling procedures. CO5: It will enhance exposure to recent trends in production planning and control and increase adaptability with latest global-production practices.
49.	World Class Manufacturing & Maintenance Management	RMB OP04	CO1: Awareness about various models which intern help organization to bring excellence in their manufacturing systems. CO2: Understanding of different tools used for enhancing excellence in manufacturing. CO3: Understanding significance of IT in world class manufacturing practices. CO4: Understanding different quality imperatives.
50.	Contract and Project Management	RMBOM05	CO1: The students would be able to determine the feasibility of new projects. CO2: Students will improve upon their conceptual skills, understanding and application of tools and techniques of Project management in business practices in real time. CO3: The student would be able to identify the risks related to Project Management. CO4: The student would be having knowledge of various contracts associated with Project Management.



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