B. Tech. First Year(All Branches)

BAS101 / BAS201: ENGINEERING PHYSICS

On completion of course the students are able :		
CO	**CO Statement**	**Bloom's Level**
CO1	To explain the distribution of energy in black body radiation and to understand the difference in particle and wave nature with explanation of Compton effect and Schrodinger wave equation.	Understanding, Apply
CO2	To understand the concept of displacement current and consistency of Ampere's law and also the properties of electromagnetic waves in different medium with the use of Maxwell's equations.	Understanding, Analyze
CO3	To understand the behavior of waves through various examples/applications of interference and diffraction phenomenon and the concept of grating and resolving power.	Apply
CO4	To know the functioning of optical fiber and its properties and applications. To understand the concept, properties and applications of Laser.	Understanding, Apply
CO5	To know the properties and applications of superconducting materials and nano materials.	Understanding

BAS102 / BAS202: ENGINEERING CHEMISTRY

Units	**Course Outcomes** **Upon completion of the course the student should be able to:**	**Bloom's Level**
CO-1	Get an understanding of the theoretical principles of chemistry of molecular structure, bonding and properties, Chemistry of advanced materials (liquid crystals, Nanomaterials, Graphite & Fullerene) as well as the Principles of Green Chemistry.	K3
CO-2	Apply the fundamental concepts of determination of structure with various spectral techniques and stereochemistry.	K4
CO-3	Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning new engineering products and categorize the reasons for corrosion and study methods to control corrosion and develop understanding of Chemistry of Engineering materials (Cement).	K3
CO-4	Develop understanding of the sources, impurities and hardness of water, apply the concepts of determination of calorific values and analyze the coal.	K3
CO-5	Develop the understanding of Chemical structure of polymers and its effect on their various properties when used as engineering materials, Understanding the applications of specific polymers and Chemistry applicable in industrial process.	K3

BAS103 : ENGINEERING MATHEMATICS-I

	Course Outcome (CO)	**Bloom's Level**
	At the end of this course, the students will be able to:	
CO 1	Understand the concept of complex matrices, Eigen values, Eigen vectors and apply the concept of rank to evaluate linear simultaneous equations	K2 & K5
CO 2	Remember the concept of differentiation to find successive differentiation, Leibnitz Theorem, and create curve tracing, and find partial and total derivatives	K1,K6 & K5
CO 3	Applying the concept of partial differentiation to evaluate extrema, series expansion, error approximation offunctions and Jacobians	K3 &K5
CO 4	Remember the concept of Beta and Gamma function; analyze area and volume and Dirichlet's theorem in multiple integral	K1 & K4
CO 5	Apply the concept of Vector Calculus to analyze and evaluate directionalderivative, line, surface and volume integrals.	K3, K4& K5

BAS203 : ENGINEERING MATHEMATICS-II

	Course Outcome (CO)	**Bloom's level**
	At the end of this course, the students will be able to:	
CO 1	Remember the concept differentiation to evaluate LDE of nth order with constant coefficient and LDE with variable coefficient of 2nd order.	K1 &K5
CO 2	Understand and apply the concept of Laplace Transform to evaluate differential equations	K2 ,K3 & K5
CO 3	Understand the concept of convergence to analyze the convergence of series and expansion of the function for Fourier series.	K2 & K4
CO 4	Apply the concept of analyticity, Harmonic function and create theimage of function applying conformal transformation	K3, K6& K3
CO 5	Apply the concept of Cauchy Integral theorem, Cauchy Integralformula, singularity and calculus of residue to evaluate integrals	K3& K5

BEE101 / BEE201: FUNDAMENTALS OF ELECTRICAL ENGINEERING

	Course Outcome (CO)	**Bloom's level**
CO 1	Apply the concepts of KVL/KCL and network theorems in solving DC circuits.	K1 &K5
CO 2	Analyze the steady state behavior of single phase and three phase AC electrical circuits.	K2 ,K3 & K5
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.	K2 & K4
CO 4	Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.	K3, K6& K3
CO 5	Describe the components of low voltage electrical installations and perform elementary calculations for energy consumption.	K3& K5 K3

BEC101 / BEC201 : FUNDAMENTALS OF ELECTRONICS ENGINEERING

Course Outcomes:

At the end of this course students will demonstrate the ability to:		Bloom's Level
CO 1	Describe the concept of PN Junction and devices.	K2 & K5
CO 2	Explain the concept of BJT, FET and MOFET.	K1,K6 & K5
CO 3	Apply the concept of Operational amplifier to design linear and non-linear applications.	K3 &K5 K1 & K4
CO 4	Perform number systems conversions, binary arithmetic and minimize logic functions.	K3, K4& K5

BCS101 / BCS201: PROGRAMMING FOR PROBLEM SOLVING

Course Outcome (CO)		Bloom's Level
At the End of Course , the Student will be Able to Understand		
CO 1	To Develop Simple Algorithms for Arithmetic and Logical Problems.	K_2, K_3
CO 2	To Translate the Algorithms to Programs & Execution (in C Language).	K_3
CO 3	To Implement Conditional Branching, Iteration and Recursion.	K_3
CO 4	To Decompose a Problem into Functions and Synthesize a Complete Program Using Divide and Conquer Approach.	K_4
CO 5	To Use Arrays, Pointers and Structures to Develop Algorithms and Programs.	K_2, K_3

BME101 / BME201: FUNDAMENTALS OF MECHANICAL ENGINEERING

The students will be able to		Blooms Level
CO1	Apply the concept of force resolution and stress and strain to solve basic problems	K3
CO2	Understand the construction details and working of internal combustion engines, electric vehicle and hybrid vehicles.	K2
CO3	Explain the construction detail and working of refrigerator, heat pump and air-conditioner.	K2
CO4	Understand fluid properties, conservation laws and hydraulic machinery used in real life.	K2
CO5	Understand the working principle of different measuring instrument and mechatronics with their advantages, scope and Industrial application.	K2

BAS104 / BAS204: ENVIRONMENT AND ECOLOGY

	Course Outcomes : At the end of the course, students will be able to	Bloom's Level
CO-1	Gain in-depth knowledge on natural processes that sustain life, and govern economy.	K2
CO-2	Estimate and Predict the consequences of human actions on the web of life, global economy and quality of human life.	K3
CO-3	Develop critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and conservation of biodiversity, social equity and sustainable development.	K4
CO-4	Acquire values and attitudes towards understanding complex environmental- economic social challenges, and participate actively in solving current environmental problems and preventing the future ones.	K3
CO-5	Adopt sustainability as a practice in life, society and industry.	K3

BAS151 / BAS251: ENGINEERING PHYSICS LAB

At the end of the course, students will be able to		
CO	**CO Statement**	**Bloom's Level**
CO-1	***Apply*** the principle of interference and diffraction to find the wavelength of monochromatic and polychromatic light.	Apply
CO-2	***Compute*** and **analyze** various electrical and electronic properties of a given material by using various experiments.	Analyze
CO-3	***Verify*** different established laws with the help of optical and electrical experiments.	Apply
CO-4	***Determine*** and ***calculate*** various physical properties of a given material by using various experiments.	Apply
CO-5	**Study** and **estimate** the performance and parameter of given equipment by using graphical and computational analysis.	Apply

BAS152 / BAS252 : ENGINEERING CHEMISTRY LAB

	Course Outcomes	Bloom's Level
CO-1	Get an understanding of the use of different analytical instruments.	K3
CO-2	Measure the molecular / system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in the water.	K3
CO-3	Measure the hardness and alkalinity of the water.	K3

CO-4	Know the fundamental concepts of the preparation of phenol formaldehyde & urea formaldehyde resin, adipic acid and Paracetamol.	K3
CO-5	Estimate the rate constant of reaction.	K3

BEE151 / BEE251 : BASIC ELECTRICAL ENGINEERING LAB

	Course Outcome (CO)	Bloom's Level
At the end of this course, the students should be able to:		
CO 1	Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits.	K3
CO 2	Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits.	K4
CO 3	Perform experiment illustrating BH curve of magnetic materials.	K3
CO 4	Calculate efficiency of a single phase transformer and DC machine.	K4
CO 5	Perform experiments on speed measurement and reversal of direction of three phase induction motor and Identify the type of DC and AC machines based on their construction.	K4

BEC151 / BEC251: BASIC ELECTRONICS ENGINEERING LAB

	Course Outcome	Bloom's Level
At the end of course , the student will be able to:		
CO 1	Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems.	K3, K4
CO 2	Demonstrate an understanding of computer programming language concepts.	K3, K2
CO 3	Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their uses.	K6, K4
CO 4	Able to define data types and use them in simple data processing applications he/she must be able to use the concept of array of structure.	K1, K5
CO 5	Develop confidence for self-education and ability for life-long learning needed for Computer language.	K3, K4

BAS155 / BAS255 : ENGLISH LANGUAGE LAB

Course Outcome: co	Bloom's Level
CO1. Students will be enabled to understand the basic objective of the course by being acquainted with specific dimensions of communication skills i.e. Reading, Writing, Listening, Thinking and Speaking.	K1
CO2. Students would be able to create substantial base by the formation of strong professional vocabulary for its application at different platforms and through numerous modes as Comprehension, reading, writing and speaking etc.	K3
CO3. Students will apply it at their work place for writing purposes such as Presentation/official drafting/administrative communication and use it for document/project/report/research paper writing.	K2
CO4. Students will be made to evaluate the correct and error-free writing by being well-versed in rules of English grammar and cultivate relevant technical style of communication &presentation at their work place and also for academic uses.	K1
CO5 Students will apply it for practical and oral presentation purposes by being honed up in presentation skills and voice-dynamics. They will apply techniques for developing interpersonal communication skills and positive attitude leading to their professional competence	K3

BCE151/ BCE251: ENGINEERING GRAPHICS & DESIGN LAB

Course Outcome:	Bloom's Level
After completion, of course students will be able to:	K1
CO 1: Use scales and draw projections of objects.	K3
CO 2: Explain views of solids and their sectional surfaces.	K2
CO 3: Analyze and draw isometric projections of objects.	K1
CO 4: Demonstrate orthographic representation of perspective views using modern tools.	K3
CO 5: Apply AutoCAD software for creation of engineering drawing and models	k2

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BWS151/ BWS251: WORKSHOP PRACTICE LAB

The students will be able to		Blooms Level
CO1	Use various engineering materials, tools, machines and measuring equipments.	**K3**
CO2	Perform machine operations in lathe and CNC machine.	**K3**
CO3	Perform manufacturing operations on components in fitting and carpentry shop.	**K3**
CO4	Perform operations in welding, moulding, casting and gas cutting.	**K3**
CO5	Fabricate a job by 3D printing manufacturing technique	**K3**

DEPARTMENT OF CS-AIML

Design and Analysis of Algorithm (KCS503)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
	Design new algorithms, prove them correct, and analyze their asymptotic and absolute runtime	K5, K6

CO 1	Design new algorithms, prove them correct, and analyze their asymptotic and absolute runtime and memory demands.	K_4, K_6
CO 2	Find an algorithm to solve the problem (create) and prove that the algorithm solves the problem correctly (validate).	K_5, K_6
CO 3	Understand the mathematical criterion for deciding whether an algorithm is efficient, and know many practically important problems that do not admit any efficient algorithms.	K_2, K_3
CO 4	Apply classical sorting, searching, optimization and graph algorithms.	K_2, K_4
CO 5	Understand basic techniques for designing algorithms, including the techniques of recursion, divide-and-conquer, and greedy.	K_2, K_3

Software Engineering (KCS-601)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course, the student will be able to		
CO 1	Explain various software characteristics and analyze different software Development Models.	K_1, K_2
CO 2	Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards.	K_1, K_2
CO 3	Compare and contrast various methods for software design	K_2, K_3
CO 4	Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing.	K_3
CO 5	Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.	K_5

Web Technology (KCS-602)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO 1	Explain web development Strategies and Protocols governing Web.	K_1, K_2
CO 2	Develop Java programs for window/web-based applications.	K_2, K_3
CO 3	Design web pages using HTML, XML, CSS and JavaScript.	K_2, K_3
CO 4	Creation of client-server environment using socket programming	K_1, K_2,
CO 5	Building enterprise level applications and manipulate web databases using JDBC	K_3, K_4
CO6	Design interactive web applications using Servlets and JSP	K_2, K_3

Computer Networks(KCS- 603)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO1	Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission	K_1,K_2
CO2	Apply channel allocation, framing, error and flow control techniques.	K_3
CO3	Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.	K_2,K_3
CO4	Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.	K_2,K_3
CO5	Explain the functions offered by session and presentation layer and their Implementation.	K_2,K_3
CO6	Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP,	$K_$

Data Compression (KCS-064)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO 1	Describe the evolution and fundamental concepts of Data Compression and Coding Techniques.	K_1, K_2
CO 2	Apply and compare different static coding techniques (Huffman & Arithmetic coding) for text compression.	K_2, K_3
CO 3	Apply and compare different dynamic coding techniques (Dictionary Technique) for text compression.	K_2, K_3
CO 4	Evaluate the performance of predictive coding technique for Image Compression.	K_2, K_3
CO 5	Apply and compare different Quantization Techniques for Image Compression.	K_2,K_3

Web Technology Lab (KCS-652)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO 1	Develop static web pages using HTML	K_2, K_3
CO 2	Develop Java programs for window/web-based applications.	K_2, K_3
CO 3	Design dynamic web pages using Javascript and XML.	K_3, K_4
CO 4	Design dynamic web page using server site programming Ex. ASP/JSP/PHP	K_3, K_4
CO 5	Design server site applications using JDDC,ODBC and section tracking API	K_3, K_4

Computer Networks Lab (KCS-663)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO 1	Simulate different network topologies.	K_3, K_4
CO 2	Implement various framing methods of Data Link Layer.	K_3, K_4
CO 3	Implement various Error and flow control techniques.	K_3, K_4
CO 4	Implement network routing and addressing techniques.	K_3, K_4
CO 5	Implement transport and security mechanisms	K_3, K_4

Software Engineering Lab (KCS-661)		
Course Outcome (CO)		**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to		
CO 1	Identify ambiguities, inconsistencies and incompleteness from a requirements specification and	$K_$, K_4

	state functional and non-functional requirement	
CO 2	Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship	K_3, K_5
CO 3	Draw a class diagram after identifying classes and association among them	K_4, K_5
CO 4	Graphically represent various UML diagrams , and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially	K_4, K_5
CO 5	Able to use modern engineering tools for specification, design, implementation and testing	K_3, K_4

Design and Analysis of Algorithm Lab (KCS-553)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Implement algorithm to solve problems by iterative approach.	K_2, K_4
CO 2	Implement algorithm to solve problems by divide and conquer approach	K_3, K_5
CO 3	Implement algorithm to solve problems by Greedy algorithm approach.	K_4, K_5
CO 4	Implement algorithm to solve problems by Dynamic programming, backtracking, branch and bound approach.	K_4, K_5
CO 5	Implement algorithm to solve problems by branch and bound approach.	K_3, K_4

Software Project Management (KOE-068)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able :		
CO 1	Identify project planning objectives, along with various cost/effort estimation models.	K_3
CO 2	Organize & schedule project activities to compute critical path for risk analysis.	K_3
CO 3	Monitor and control project activities.	K_4, K_5
CO 4	Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.	K_6
CO 5	Configure changes and manage risks using project management tools.	K_2, K_4

KAI501	ARTIFICIAL INTELLIGENCE	
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to understand		
CO 1	Understand the basics of the theory and practice of Artificial Intelligence as a discipline and about intelligent agents.	K_2
CO 2	Understand search techniques and gaming theory.	K_2, K_3
CO 3	The student will learn to apply knowledge representation techniques and problem solving strategies to common AI applications.	K_3 , K_4
CO 4	Student should be aware of techniques used for classification and clustering.	K_2 , K_3
CO 5	Student should aware of basics of pattern recognition and steps required for it.	K_2 , K_4

KAI 551	ARTIFICIAL INTELLIGENCE LAB	
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to		
CO 1	Use of python to understand the concept of AI	K_3
CO 2	Implementation of Different AI Techniques	K_4, K_5
CO 3	Application of AI techniques in practical Life	K_4
CO 4	Understanding of Natural Language Tool Kit.	K_2
CO 5	Practical Application of Natural Language Tool Kit	K_4, K_5

KML 061	ADVANCED MACHINE LEARNING	
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Understand advanced concepts and methods of machine learning and to develop an understanding of the role of machine learning in massive scale automation.	K_1, K_2
CO 2	Apply various machine learning algorithms in a range of real-world applications.	K_3, K_3
CO 3	Integrate and apply their expertise to produce solutions for real-world problems.	K_4, K_5
CO 4	Comparative Analysis of different Machine Learning Algorithms	K_4
CO 5	Interpret and Analyze results with reasoning using different ML techniques.	K_4, K_5

COMPILER DESIGN LAB (KCS-552)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Identify patterns, tokens & regular expressions for lexical analysis.	K_2, K_4
CO 2	Design Lexical analyser for given language using C and LEX /YACC tools	K_3, K_5
CO 3	Design and analyze top down and bottom up parsers.	K_4, K_5
CO 4	Generate the intermediate code	K_4, K_5
CO 5	Generate machine code from the intermediate code forms	K_3, K_4

KAI 651	MACHINE LEARNING LAB	
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to		
CO 1	Understand complexity of Machine Learning algorithms and their limitations;	K_5, K_6
CO 2	Understand modern notions in data analysis-oriented computing;	K_5, K_6
CO 3	Be capable of performing experiments in Machine Learning using real-world data.	K_5, K_6

CO 4	Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own;	K_5, K_6

Machine Learning Techniques (KCS 055)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able:		
CO 1	To understand the need for machine learning for various problem solving	K_1 , K_2
CO 2	To understand a wide variety of learning algorithms and how to evaluate models generated from data	K_1 , K_3
CO 3	To understand the latest trends in machine learning	K_2 , K_3
CO 4	To design appropriate machine learning algorithms and apply the algorithms to a real-world problems	K_4 , K_6
CO 5	To optimize the models learned and report on the expected accuracy that can be achieved by applying the models	K_4, K_5

Web Designing (KCS-052)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Understand principle of Web page design and about types of websites	K_3, K_4
CO 2	Visualize and Recognize the basic concept of HTML and application in web designing.	K_1, K_2
CO 3	Recognize and apply the elements of Creating Style Sheet (CSS).	K_2, K_4
CO 4	Understand the basic concept of Java Script and its application.	K_2, K_3
CO 5	Introduce basics concept of Web Hosting and apply the concept of SEO	K_2, K_3

Compiler Design (KCS-502)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.	K_3, K_6
CO 2	Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table.	K_2, K_6
CO 3	Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.	K_4, K_5
CO 4	Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.	K_2, K_3
CO 5	Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.	K_2, K_4

Database Management Systems Lab (KCS-551)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Understand and apply oracle 11 g products for creating tables, views, indexes, sequences and other database objects.	K_2, K_4
CO 2	Design and implement a database schema for company data base, banking data base, library information system, payroll processing system, student information system.	K3, K5, K6
CO 3	Write and execute simple and complex queries using DDL, DML, DCL and TCL	K_4, K_5
CO 4	Write and execute PL/SQL blocks, procedure functions, packages and triggers, cursors.	K_4, K_5
CO 5	Enforce entity integrity, referential integrity, key constraints, and domain constraints on database.	K_3, K_4

Database Management System (KCS501)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to:		
CO 1	Apply knowledge of database for real life applications.	K_3
CO 2	Apply query processing techniques to automate the real time problems of databases.	K_3, K_4
CO 3	Identify and solve the redundancy problem in database tables using normalization.	K_2, K_3
CO 4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.	K_2, K_4
CO 5	Design, develop and implement a small database project using database tools.	K_3, K_6

Cryptography & Network Security (KCS074)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to understand		
CO 1	Classify the symmetric encryption techniques and Illustrate various Public key cryptographic techniques.	K2 , K3
CO 2	Understand security protocols for protecting data on networks and be able to digitally sign emails and files.	K1 , K2
CO 3	Understand vulnerability assessments and the weakness of using passwords for authentication	K4
CO 4	Be able to perform simple vulnerability assessments and password audits	K3
CO 5	Summarize the intrusion detection and its solutions to overcome the attacks.	K2

Mobile Computing (KCS711)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course, the student will be able to understand		
CO 1	Explain and discuss issues in mobile computing and illustrate overview of wireless telephony and channel allocation in cellular systems.	K1, K4
CO 2	Explore the concept of Wireless Networking and Wireless LAN.	K1
CO 3	Analyse and comprehend Data management issues like data replication for mobile computers, adaptive clustering for mobile wireless networks and Disconnected operations.	K4

	adaptive clustering for mobile wireless networks and Disconnected operations.	
CO 4	Identify Mobile computing Agents and state the issues pertaining to security and fault tolerance in mobile computing environment.	K1, K2
CO 5	Compare and contrast various routing protocols and will identify and interpret the performance of network systems using Adhoc networks.	K2

Cloud Computing (KCS713)		
Course Outcome (CO)		Bloom's Knowledge Level (KL)
At the end of course , the student will be able to understand		
CO 1	Describe architecture and underlying principles of cloud computing.	K_3
CO 2	Explain need, types and tools of Virtualization for cloud.	K_3, K_4
CO 3	Describe Services Oriented Architecture and various types of cloud services.	K_2, K_3
CO 4	Explain Inter cloud resources management cloud storage services and their providers Assess security services and standards for cloud computing.	K_2, K_4
CO 5	Analyze advanced cloud technologies.	K_3, K_6

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING		
COURSE OUTCOME	ODD SEMESTER:	
7th Sem		
Course Outcomes		BL
Course 1 -RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING (KHU701)		
	Course Outcome/ Unit	
CO1	Students can understand the definitions, concepts and components of Rural Development	K1
CO2	Students will know the importance, structure, significance, resources of Indian rural economy	K1,K2
CO3	Students will have a clear idea about the area development programmes and its impact.	K1
CO4	Students will be able to acquire knowledge about rural entrepreneurship.	K1
CO5	Students will be able to understand about the using of different methods for human resource planning	K1,K2

Course Outcomes		BL
Course 2 -Wireless & Mobile Communication(KEC076)		
	Course Outcome/ Unit	
CO1	Express the basic knowledge of mobile radio & cellular communication fundamentals and their application to propagation mechanisms, path loss models and multi-path phenomenon.	K1
CO2	Apply the knowledge of wireless transmission basics to understand the concepts of equalization and multiple access techniques.	K4
CO3	Apply the knowledge of wireless transmission basics to understand the concepts of equalization and multiple access techniques	K4
CO4	Examine the performance of cellular systems being employed such as GSM, CDMA and LTE using various theoretical and mathematical aspects.	K2
CO5	Express basic knowledge of Mobile Adhoc networks and the existing & upcoming data communication networks in wireless and mobile communication domain.	K1,K2

Course Outcomes		BL
Course 3 -Optical Network (KEC073)		
	Course Outcome/ Unit	
CO1	Express the multiplexing techniques, second generation optical networks, optical layer, and optical packet switching.	K1
CO2	Explain the concept of Principles of operation, Conservation of energy, Isolators and Circulators: Principles of operation.	K1,K2
CO3	Classify the basics of Multiplexing, SONET/SDH layers, SONET Frame structure, SONET/SDH physical layer, Elements of a SONET/SDH infrastructure.	K2
CO4	Interpret the knowledge of Routing and wavelength assignment problems, Dimensioning Wavelength Routing Networks, Network Survivability.	K3
CO5	Analyse the working of OTDM, Synchronization, Header Processing, Buffering, Burst Switching, Deployment Considerations- SONET/SDH core Network.	K2

Course Outcomes		BL
Course 4 -RENEWABLE ENERGY RESOURCES (KOE074)		
	Course Outcome/ Unit	
CO1	Identify and assess the energy conservation/saving opportunities in different electric system and understand related legislations.	K1
CO2	Identify and assess the energy saving behavior of utilities through implementation of DSM and EMIS.	K1
CO3	Explain energy audit & management and to prepare energy audit report for different energy conservation instances.	K2
CO4	Illustrate the energy audit for Mechanical Utilities.	K3

CO5	Describe cost-effective measures towards improving energy efficiency and energy conservation by implementation of energy efficient technologies.	**K2**

Course Outcomes		**BL**
Course 5 -Optical System and Networking Lab (KEC753C)		
	Course Outcome/ Unit	
CO1	Define the concept of Optical Systems and Networking.	**K1**
CO2	Indentify the various types of cables, connectors, routers and switches.	**K1**
CO3	Design the various networking protocols.	**K2**
CO4	Create various fiber optic link.	**K3**
CO5	Interpret the basic knowledge of multiplexing and coding-decoding.	**K1**

5th sem

Course Outcomes		**BL**
Course 6 -Integrated Circuit (KEC501)		
	Course Outcome/ Unit	
CO1	Explain complete internal analysis of Op-Amp 741-IC.	**K1**
CO2	Examine and design Op-Amp based circuits and basic components of ICs such as various types of filter.	**K1,K2**
CO3	Implement the concept of Op-Amp to design Op-Amp based non- linear applications and wave-shaping circuits.	**K2**
CO4	Analyse and design basic digital IC circuits using CMOS technology.	**K2**
CO5	Describe the functioning of application specific ICs such as 555 timer ,VCO IC 566 and PLL.	**K1**

Course Outcomes		**BL**
Course 7-Microprocessor & Microcontroller (KEE502)		
	Course Outcome/ Unit	
CO1	Demonstrate the basic architecture of 8085.	**K1**
CO2	Illustrate the programming model of microprocessors & write program using 8085 microprocessor.	**K1**
CO3	Demonstrate the basics of 8086 Microprocessor and interface different external Peripheral Devices like timer, USART etc. with Microprocessor (8085/8086).	**K1,K2**
CO4	Compare Microprocessors & Microcontrollers, and comprehend the architecture of 8051 microcontroller	**K2**
CO5	Illustrate the programming model of 8051 and implement them to design projects on real time problems.	**K2,K3**

Course Outcomes		**BL**
Course 8 -Digital Sigal Processing (KEC503)		
	Course Outcome/ Unit	
CO1	Design and describe different types of realizations of digital systems (IIR and FIR) and their utilities.	**K2**
CO2	Select design parameters of analog IIR digital filters (Butterworth and Chebyshev filters) and implement various methods such as impulse invariant transformation and bilinear transformation of conversion of analog to digital filters.	**K3**
CO3	Design FIR filter using various types of window functions.	**K3**
CO4	Define the principle of discrete Fourier transform & its various properties and concept of circular and linear convolution. Also, students will be able to define and implement FFT i.e. a fast computation method of DFT.	**K1**
CO5	Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications.	**K1**

Course Outcomes		**BL**
Course 9 -Computer Architecture and Organization (KEC051)		
S.No.	Course Outcome/ Unit	
1	Discuss about the basic concepts of system design methodology and processor level design.	**K1**
2	Explain the basics of processor and basic formats of data representation.	**K1**
3	Perform fixed and floating point arithmetic operations.	**K2**
4	Describe the basic concepts of control design and pipeline performance.	**K1**
5	Explain the architecture and functionality of central processing unit.	**K1**

Course Outcomes		**BL**
Course 10 -Electronics Mesurement & Instrumentation (KEC057)		
	Course Outcome/ Unit	
CO1	Classify the Instrumentation and Measurement system and various measurement errors.	**K2**
CO2	Analyze and design voltmeter circuits, AC electronic voltmeter, digital frequency meter and current measurement with electronic instruments.	**K1,K2**
CO3	Evaluate various resistance and impedance measuring methods using Bridges and Q-meter.	**K1**

CO4	Analyze fundamental operation of CRO and some special type of oscilloscopes like DSO, Sampling oscilloscope.	K1
CO5	Demonstrate calibration method to calibrate various instruments and classify transducers like for force, pressure, motion, temperature measurement etc.	K1,K2

Course Outcomes		BL
Course 11 -Integrated Circuit Lab (KEC551)		
	Course Outcome/ Unit	
CO1	Design different non-linear applications of operational amplifiers such as log, antilog amplifiers and voltage comparators.	K3
CO2	Explain and design different linear applications of operational amplifiers such as filters.	K1
CO3	Demonstrate the function of waveforms generator using op-Amp.	K1
CO4	Construct multivibrator and oscillator circuits using IC555 and IC566 and perform measurements of frequency and time.	K4
CO5	Design and practically demonstrate the applications based on IC555 and IC566.	K4

Course Outcomes		BL
Course 12 -Microprocessor & Microcontroller Lab (KEC552)		
	Course Outcome/ Unit	
CO1	Use techniques, skills, modern engineering tools, instrumentation and software/hardware appropriately to list and demonstrate arithmetic and logical operations on 8 bit data using microprocessor 8085.	K1
CO2	Examine 8085 & 8086 microprocessor and its interfacing with peripheral devices.	K1
CO3	State various conversion techniques using 8085 & 8086 and generate waveforms using 8085.	K1
CO4	Implement programming concept of 8051 Microcontroller.	K2
CO5	Design concepts to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.	K4

Course Outcomes		BL
Course 13 -Digital Sigal Processing Lab (KEC553)		
	Course Outcome/ Unit	
CO1	Create and visualize various discrete/digital signals using MATLAB/Scilab.	K3
CO2	Implement and test the basic operations of Signal processing.	K2
CO3	Examine and analyse the spectral parameters of window functions.	K2
CO4	Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.	K4
CO5	Design the signal processing algorithms using MATLAB/Scilab.	K4
Course Outcomes		BL
Course 14 - Indian Tradition, Culture and Society (KNC502)		
	Course Outcome/ Unit	
CO1	The course aims at imparting basic principles of thought process, reasoning and inference to identify the roots and details of some of the contemporary issues faced by our nation and try to locate possible solutions to these challenges by digging deep into our past.	K2
CO2	To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development.	K3
CO3	To sensitize students towards issues related to 'Indian' culture, tradition and its composite character.	K2
CO4	To make students aware of holistic life styles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions.	K1
CO5	To acquaint students with Indian Knowledge System, Indian perspective of modern scientific world-view and basic principles of Yoga and holistic health care system.	K1

3rd Sem

Course Outcomes		BL
Course 15 -Material Science (KOE 032)		
S.No.	Course Outcome/ Unit	
CO1	Students will be able to identify the mechanical properties based on composition of micro-constituents depicted in the phase-diagram.	K2
CO2	Students will learn the structure and properties of alloys and composites.	K2
CO3	Students will be able to understand the properties and application of new materials.	K1
Course Outcomes		BL
Course 16 -Universal Human Values (KVE301)		
S.No.	Course Outcome/ Unit	
CO1	To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.	K2
CO2	To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.	K2
CO3	To channelize students' thinking towards basic understanding of the legal concepts and its implications for engineers.	K2

CO4	To acquaint students with latest intellectual property rights and innovation environment with related regulatory framework.	**K2**
CO5	To make students learn about role of engineering in business organizations and e-governance.	**K3**

Course Outcomes		**BL**
Course 17 -Electronic Device (KEC301)		
	Course Outcome/ Unit	
CO1	Understand the principles of semiconductor Physics.	**K2**
CO2	Understand and utilize the mathematical models of semiconductor junctions.	**K2**
CO3	Understand carrier transport in semiconductors and design resistors.	**K2,K3**
CO4	Utilize the mathematical models of MOS transistors for circuits and systems.	**K3**
CO5	Analyse and find application of special purpose diodes.	**K3**

Course Outcomes		**BL**
Course 18 -Digital Sysytem Design (KEC302)		
	Course Outcome/ Unit	
CO1	Design and analyze combinational logic circuits.	**K3**
CO2	Design and analyze modular combinational circuits with MUX / DEMUX, Decoder & Encoder	**K3**
CO3	Design & analyze synchronous sequential logic circuits	**K3**
CO4	Analyze various logic families.	**K2**
CO5	Design ADC and DAC and implement in amplifier, integrator, etc.	**K3**

Course Outcomes		**BL**
Course 19 -Network Anaysis and Synthesis (KEC303)		
	Course Outcome/ Unit	
CO1	Understand basics electrical circuits with nodal and mesh analysis.	**K1**
CO2	Appreciate electrical network theorems.	**K1,K2**
CO3	Apply Laplace transform for steady state and transient analysis.	**K2**
CO4	Determine different network functions.	**K2**
CO5	Appreciate the frequency domain techniques.	**K2**

Course Outcomes		**BL**
Course 20 -Electronic Device Lab (KEC351)		
	Course Outcome/ Unit	
CO1	Understand working of basic electronics lab equipment.	**K1**
CO2	Understand working of PN junction diode and its applications.	**K1**
CO3	Understand characteristics of Zener diode.	**K1**
CO4	Design a voltage regulator using Zener diode.	**K3**
CO5	Understand working of BJT, FET, MOSFET and apply the concept in designing of amplifiers.	**K2**

Course Outcomes		**BL**
Course 21 -Digital Sysytem Design Lab (KEC352)		
	Course Outcome/ Unit	
CO1	Design and analyze combinational logic circuits.	K3
CO2	Design & analyze modular combinational circuits with MUX/DEMUX, decoder, encoder.	K3
CO3	Design & analyze synchronous sequential logic circuits.	K3
CO4	Design & build mini project using digital ICs.	K4

Course Outcomes		**BL**
Course 22 -Network Anaysis and Synthesis Lab (KEC353)		
	Course Outcome/ Unit	
CO1	Understand basics of electrical circuits with nodal and mesh analysis.	**K1**
CO2	Appreciate electrical network theorems.	**K2**
CO3	Analyse RLC circuits.	**K2**
CO4	Determine the stability of an electrical circuit.	**K1**
CO5	Design network filters.	**K3**

Course Outcomes		**BL**
Course 23 -Computer System Security (KNC301)		
	Course Outcome/ Unit	
CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	**K1 & K2**
CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	**K2**
CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	**K3**
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	**K4**

CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	**K5 & K6**

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOME	EVEN SEMESTER

8th Sem

Course Outcomes		BL
Course 1 - PROJECT MANAGEMENT & ENTREPRENEURSHIP(KHU 802)		
	Course Outcome/ Unit	
CO1	Understand project characteristics and various stages of a project.	**K1**
CO2	Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic.	**K1**
CO3	Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.	**K2**
CO4	Apply the risk management plan and analyse the role of stakeholders.	**K1**
CO5	Understand the contract management, Project Procurement, Service level Agreements and productivity.	**K2**

Course Outcomes		BL
Course 2 - QUALITY MANAGEMENT(KOE 085)		
	Course Outcome/ Unit	
CO1	To understand the concept of Quality	**K1**
CO2	To understand the Implication of Quality on Business	**K1**
CO3	To Implement Quality Implementation Programs	**K2**
CO4	To have exposure to challenges in Quality Improvement Programs	**K2**
CO5	Develop research skills that will allow them to keep abreast of changes in the field of Quality Management	**K2**

Course Outcomes		**BL**
Course 3 -DIGITAL AND SOCIAL MEDIA MARKETING KOE 094		
	Course Outcome/ Unit	
CO1	Students will understand what is digital Marketing ,what are trends for shift to Digital Marketing	K1,K2
CO2	What is Social Media Marketing, What is Blogging, how to create a Blog , SEO	K2
CO3	Mobile Marketing,Vidoe Marketing, SEO,Social media Marketing	K1
CO4	How to design Social Success , what is PR , How digital Marketing adding Value	K2
CO5	Digital Innovation and Trends, Digital transformation framework, trends in digital marketing .	K2
Course Outcomes		**BL**
Course 4 – PROJECT II (KEC 851)		
	Course Outcome/ Unit	
CO1	Work effectively as an individual and member of the team to solve complex civil engineeringproblems	K1
CO2	Apply engineering knowledge to solve real life problems and involve in self- learning process	K3
CO3	Apply modern tools for analysis and design of complex engineeringproblems	K4
CO4	Develop ethical solutions of engineeringproblems takinginto account its impact on society, environment and sustainability	K2
CO5	Compose and present detailed project report of his/ her workand defend effectively.	K2

6th Sem

Course Outcomes		BL
Course 5 - Digital Cominication (KEC601)		
	Course Outcome/ Unit	
CO1	To formulate basic statistics involved in communication theory.	K1
CO2	To demonstrate the concepts involved in digital communication.	K1
CO3	To explain the concepts of digital modulation schemes.	K2
CO4	To analyze the performance of digital communication systems.	K2
CO5	To apply the concept of information theory in digital systems.	K3

Course Outcomes		BL
Course 6 - Control System (KEC602)		
	Course Outcome/ Unit	
CO1	Describe the basics of control systems along with different types of feedback and its effect. Additionally they will also be able to explain the techniques such as block diagrams reduction, signal flow graph and modelling of various physical systems along with modelling of DC servomotor.	K2
CO2	Explain the concept of state variables for the representation of LTI system.	K2
CO3	Interpret the time domain response analysis for various types of inputs along with the time domain specifications.	K2
CO4	Distinguish the concepts of absolute and relative stability for continuous data systems along with different methods.	K2
CO5	Interpret the concept of frequency domain response analysis and their specifications.	K1,K2

Course Outcomes		BL
Course 7 - Antenna and Wave Propagation (KEC603)		
	Course Outcome/ Unit	
CO1	Identify different coordinate systems and their applications in electromagnetic field theory to establish a relation between any two systems using the vector calculus.	K2
CO2	Explain the concept of static electric field, current and properties of conductors.	K1
CO3	Express the basic concepts of ground, space, sky wave propagation mechanism.	K2
CO4	Demonstrate the knowledge of antenna fundamentals and radiation mechanism of the antenna.	K3
CO5	Analyze and design different types of basic antennas.	K2

Course Outcomes		BL
Course 8 - SATELLITE COMMUNICATION (KEC062)		
	Course Outcome/ Unit	
CO1	Define and list the benefits of satellite communication.	K1
CO2	Demonstrate orbital mechanics principles of satellite communication systems and solve problems related to it.	K2
CO3	Describe a satellite link and identify ways to improve the link performance.	K2
CO4	Classify new technologies of satellite communication systems as per given specifications.	K2
CO5	Examine advanced technologies of satellite launching and describe the Indian satellite system.	K2

Course Outcomes		BL
Course 9 - IDEA TO BUSINESS MODEL (KOE 060)		
	Course Outcome/ Unit	
CO1	This course can motivate students to have an overall idea how to start and sustain a business enterprise.	K1
CO2	The students will learn basics of choosing an idea of a business model.	K1
CO3	The core areas of choosing a business model are encompassed with Entrepreneurship development, PPC & communication system. The students will thus develop basic competencies how to run a businessenterprise.	K1 & K2

Course Outcomes		BL
Course 10 - Digital Cominication Lab (KEC651)		
	Course Outcome/ Unit	
CO1	To formulate basic concepts of pulse shaping in digital communication.	K1
CO2	To identify different line coding techniques and demonstrate the concepts.	K1,K2
CO3	To design equipments related to digital modulation and demodulation schemes.	K3
CO4	To analyze the performance of various digital communication systems and evaluate the key parameters.	K2
CO5	To conceptualize error detection & correction using different coding schemes in digital communication.	K1,K2

Course Outcomes		**BL**
Course 11 - Control System Lab (KEC652)		
	Course Outcome/ Unit	
CO1	Classify different tools in MATLAB along with the basic matrix operations used in MATLAB.	K1
CO2	Evaluate the poles and zeros on s-plane along with transfer function of a given system.	K1
CO3	Construct state space model of a linear continuous system.	K2
CO4	Appraise the steady state error of a given transfer function.	K2
CO5	Evaluate the various specifications of time domain response of a given system.	K3

Course Outcomes		BL
Course 12 - Mesaurement& Instrumentation Lab (KEC652)		
	Course Outcome/ Unit	
CO1	Measure the unknown resistance, capacitance and inductance using LCR Bridge, Kelvin double bridge, Schering bridge, Hay's bridge, De sauty bridge.	K1
CO2	Practically demonstrate the different types of transducers like J-type, K-type, PT -100 and RTD.	K1
CO3	Interpret frequency and phase difference from Lissajous figure.	K1
CO4	Interpret hybrid parameters of transistor and demonstrate different transducer like LDR and LVDT.	K1
CO5	Demonstrate Experiment using PLC Trainer Kits	K2
Course Outcomes		BL
Course 13 -Constitution of India, Law and Engineering (KNC601)		
	Course Outcome/ Unit	

CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	**K2**
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	**K2**
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	**K2**
CO4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	**K2**
CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	**K2**

4th Sem

Course Outcomes		**BL**
Course 14 - Math-IV (KAS402)		
	Course Outcome/ Unit	
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.	K3
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	K4
CO3	Understand the concept of static magnetic field, magnetic scalar and vector potential	K4
CO4	Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	K4
CO5	Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	K3

Course Outcomes		**BL**
Course 15 - Technical Communication (KAS401)		
	Course Outcome/ Unit	
CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers	K2
CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K2
CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K2
CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K4
CO5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K4

Course Outcomes		**BL**
Course 16 - Communication Engineering (KEC401)		
	Course Outcome/ Unit	
CO1	Analyze and compare different analog modulation schemes for their efficiency and bandwidth.	K1,K1
CO2	Analyze the behavior of a communication system in presence of noise.	K2
CO3	Investigate pulsed modulation system and analyze their system performance.	K2
CO4	Investigate various multiplexing techniques.	K2
CO5	Analyze different digital modulation schemes and compute the bit error performance.	K2

Course Outcomes		**BL**
Course 17 - Analog Circuits (KEC402)		
	Course Outcome/ Unit	
CO1	Understand the characteristics of diodes and transistors.	K1
CO2	Design and analyze various rectifier and amplifier circuits.	K2,K3
CO3	Design sinusoidal and non-sinusoidal oscillators.	K3
CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K1
CO5	Design LPF, HPF, BPF, BSF.	K2

Course Outcomes		**BL**
Course 18 - Signal System (KEC403)		
	Course Outcome/ Unit	
CO1	Analyze different types of signals.	K2
CO2	Analyze linear shift-invariant (LSI) systems.	K2
CO3	Represent continuous and discrete systems in time and frequency domain using Fourier series and transform.	K1
CO4	Analyze discrete time signals in z-domain.	K2
CO5	Study sampling and reconstruction of a signal.	K1

Course Outcomes		BL
Course 19 - Communication Engineering Lab (KEC451)		
	Course Outcome/ Unit	
CO1	Analyze and compare different analog modulation schemes for their modulation factor and power.	K2
CO2	Study pulse amplitude modulation.	K2
CO3	Analyze different digital modulation schemes and can compute the bit error performance.	K2
CO4	Study and simulate the Phase shift keying.	K1
CO5	Design a front end BPSK modulator and demodulator.	K3

Course Outcomes		**BL**
Course 20 -Analog Circuits Lab (KEC452)		
CO	**Course Outcome/ Unit**	
CO1	Understand the characteristics of transistors.	K1
CO2	Design and analyze various configurations of amplifier circuits.	K3
CO3	Design sinusoidal and non-sinusoidal oscillators.	K3
CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits.	K2
CO5	Design ADC and DAC.	K3

Course Outcomes		**BL**
Course 21 -Signal System Lab (KEC453)		
CO	**Course Outcome/ Unit**	
CO1	Understand the basics operation of MATLAB.	K1
CO2	Analysis the time domain and frequency domain signals.	K2
CO3	Implement the concept of Fourier series and Fourier transforms.	K2
CO4	Find the stability of system using pole-zero diagrams and bode diagram.	K2
CO5	Design frequency response of the system.	K2,K3
Course Outcomes		**BL**
Course 22 -Python Programming (KNC402)		
CO	**Course Outcome/ Unit**	
CO1	To read and write simple Python programs.	K1,L2
CO2	To develop Python programs with conditionals and loops.	K1,K4
CO3	To define Python functions and to use Python data structures –- lists, tuples, dictionaries	K3
CO4	To do input/output with files in Python	K2
CO5	To do searching ,sorting and merging in Python	K2,K4

DEPARTMENT OF ELECTRICAL AND ELECTRONICES ENGINEERING	
CO	**ODD SEMESTER:**

7TH Sem

Course 1 -RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING(KHU701)		
	Course Outcome/ Unit	
		BL
CO1	Students can understand the definitions, concepts and components of Rural Development	K1
CO2	Students will know the importance, structure, significance, resources of Indian rural economy	K2
CO3	Students will have a clear idea about the area development programmes and its impact.	K2
CO4	Students will be able to acquire knowledge about rural entrepreneurship.	K2
CO5	Students will be able to understand about the using of different methods for human resource planning	K2
Course 2 - HVDC & AC Transmission (KEE072)		
CO	**Course Outcome/ Unit**	**BL**
CO1	Describe the comparison of EHVAC and HVDC transmission while understanding various issues related to transmission.	K1
CO2	Calculate and study the corona loss and its impacts. Cite examples of the causes of switching overvoltage, Ferro-resonance.	K3
CO3	Explain the generation and measurement circuits for impulse, high DC & AC voltages. While considering the design parameters evaluate the effect on the performance of the EHV lines.	K2
CO4	Classify the DC links and choice of converter configuration to investigate the impact of inductance on operation of converters and identify different control schemes as well as starting and stopping methods of DC links.	K4
CO5	Describe the converter faults, protections including MTDC types and applications.	K2

Course Outcomes		BL
- UTILIZATION OF ELECTRICAL ENERGY & ELECTRIC TRACTION (KEE079)		
CO	**Course Outcome/ Unit**	
CO1	Describe the methods of electric heating and their advantages.	K1

CO2	Explain the types of Electric welding and the principle of Electro-deposition, laws of electrolysis and its applications	K2
CO3	Explain the laws of illumination and explain the principle of refrigeration and air- conditioning.	K2
CO4	Describe the different types of Electric traction, system of track electrification and its related mechanics	K2
CO5	Describe the salient features of traction drive and concept of energy saving using power electronic control of AC and DC drives	K2

Course Outcomes		**BL**
Course 4 -RENEWABLE ENERGY RESOURCES (KOE074)		
CO	Course Outcome/ Unit	
CO1	Identify and assess the energy conservation/saving opportunities in different electric system and understand related legislations.	K1
CO2	Identify and assess the energy saving behavior of utilities through implementation of DSM and EMIS.	K1
CO3	Explain energy audit & management and to prepare energy audit report for different energy conservation instances.	K2
CO4	Illustrate the energy audit for Mechanical Utilities.	K3
CO5	Describe cost-effective measures towards improving energy efficiency and energy conservation by implementation of energy efficient technologies.	K2

Course Outcomes		**BL**
Course 5 -INDUSTRIAL AUTOMATION & PLC LAB (KEE753)		
	Course Outcome/ Unit	
CO1	Identify the requirements of automation in a process plant and known the process to design the blocks of the system.	K1,K4
CO2	Develop simple assembly language programs for 8051 microcontroller	K1,K2
CO3	Develop assembly language programs to interface the microcontroller with the peripherals.	K1,K3
CO4	Develop simple ladder programs for a standard PLC	K1,K2
CO5	Develop ladder programs for various applications and interface I/O devices with the PLC modules.	K1,K3

5th Sem

Course Outcomes		**BL**
Course 6 -POWER SYSTEM-I (KEE501)		
CO	**Course Outcome/ Unit**	
CO1	Describe the working principle and basic components of conventional power plants as well as the other aspects of power generation.	K2
CO2	Recognize elements of power system and their functions, as well as compare the different types of supply systems. Illustrate different types of conductors, transmission lines and various performance parameters of transmission line for short, medium and long transmission line.	K4
CO3	Calculate sag and tension in overhead lines with and without wind and ice loading. Classify different type of insulators, determine potential distribution over a string of insulator, string efficiency and its improvement.	K4
CO4	Compute the inductance and capacitance of single phase, three phase lines with symmetrical and unsymmetrical spacing, Composite conductors-transposition, bundled conductors, and understand the effect of earth on capacitance of transmission lines.	K4
CO5	Elucidate different types of cables and assess the Resistance and capacitance parameters of cables, grading of cables and compare overhead lines and cables.	K4

Course Outcomes		**BL**
Course 7 Control System (KEE502)		
CO	**Course Outcome/ Unit**	
CO1	Obtain transfer functions to predict the correct operation of open loop and closed loop control systems and identify the basic elements, structures and the characteristics of feedback control systems.	K3
CO2	Measure and evaluate the performance of basic control systems in time domain. Design specification for different control action.	K4
CO3	Analyze the stability of linear time-invariant systems in time domain using Routh- Hurwitz criterion and root locus technique.	K4
CO4	Determine the stability of linear time-invariant systems in frequency domain using Nyquist criterion and Bode plot.	K4
CO5	Design different type of compensators to achieve the desired performance of control System by root locus and Bode plot method. Develop and analyze the intermediate states of the system using state space analysis.	K5

Course Outcomes		**BL**
Course 8 -Electrical Machines-II (KEE503)		
	Course Outcome/ Unit	
CO1	Demonstrate the constructional details and principle of operation of three phase Induction and Synchronous Machines.	K3
CO2	Analyze the performance of the three phase Induction and Synchronous Machines using the phasor diagrams and equivalent circuits.	K4

CO3	Select appropriate three phase AC machine for any application and appraise its significance.	K4
CO4	Start and observe the various characteristics of three phase Induction & Synchronous Machines	K4
CO5	Explain the principle of operation and performance of Single-Phase Induction Motor & Universal Motor.	K3

Course Outcomes		**BL**
Course 9 -Bio-Medical Instrumention(KEN051)		
	Course Outcome/ Unit	
CO1	Understand the physiological system of the body and also an understanding on the generation of various bioelectric signals like ECG, EEG and EMG, their characteristic features and concepts of transduction.	K2
CO2	Remember the various techniques and clinical instruments available for the measurement of various physiological parameters.	K2
CO3	Apply the various techniques and clinical instruments available for the measurement of various Nervous system parameters	K3
CO4	Evaluate fundamentals of medical instrumentation along with their working principle.	K4
CO5	Differentiate patient monitoring system, theretypes and safety hazards	K3

Course Outcomes		**BL**
Course 10 -Analog & Digital Communication (KEE058)		
CO	**Course Outcome/ Unit**	
CO1	Understand the Amplitude Modulation in communication system.	K2
CO2	Comprehend the Frequency & Phase modulation.	K2
CO3	Realize the Pulse Modulation Techniques.	K2
CO4	Get the Digital Modulation Techniques and their use in communication system.	K2
CO5	Apply the concept of Information Theory in Communication Engineering.	K3

Course Outcomes		**BL**
Course 11 -Power System -I Lab (KEE551)		
	Course Outcome/ Unit	
CO1	Use programming tools /Software: Scilab, MATLAB or any C, C++ - Compiler and formulate a program/simulation model for calculation of various parameters related to transmission line.	K1
CO2	Explain various aspects of design considerations of different type of power plant and electrical equipment.	K2
CO3	Describe various aspects design of various components of distribution system. Calculate voltage drop, size of conductor, And also Acquire knowledge of load forecasting.	K3
CO4	nalyze various types of transmission line parameter to design transmission line and understand the sending end and receiving end circle diagram.	K1
CO5	Acquire knowledge of filtration and Treatment of transformer oil and Apply techniques to evaluate dielectric strength of transformer oil, capacitance and dielectric loss of an insulating material.	K2

Course Outcomes		**BL**
Course 12 -Control System Lab (KEE552)		
CO	**Course Outcome/ Unit**	
CO1	Determine the characteristics of control system components like ac servo motor, synchro, potentiometer, servo voltage stabilizer and use them in error detector mode.	K4
CO2	Compare the performance of control systems by applying different controllers / compensators.	K5
CO3	Analyze the behavior of dc motor in open loop and closed loop conditions at various loads & determine the response of 1^{st} & 2^{nd} order systems for various values of constant K.	K5
CO4	Apply different stability methods of time & frequency domain in control systems using software & examine their stability.	K4
CO5	Convert the transfer function into state space & vice versa & obtain the time domain response of a second order system for step input and their performance parameters using software.	K5

Course Outcomes		**BL**
Course 13 -Electrical Machine-II (KEE553)		
	Course Outcome/ Unit	
CO1	Perform various tests and demonstrate the various characteristics of three phase induction motor.	K4
CO2	Demonstrate the working of three phase synchronous machine under different operating conditions.	K4
CO3	Evaluate the performance of single-phase induction motor under different operating conditions.	K5
CO4	Develop simulation models for Electrical Machines.	K6

Course Outcomes		**BL**
Course 14 -Constitution of India, Law and Engineering (KNC501)		
CO	**Course Outcome/ Unit**	

CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	K2
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	K2
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K2
CO4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	K2
CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	K2

3rd Sem

Course Outcomes		**BL**
Course 15 -Material Science (KOE 032)		
	Course Outcome/ Unit	
CO1	Students will be able to identify the mechanical properties based on composition of micro-constituents depicted in the phase-diagram.	**K2**
CO2	Students will learn the structure and properties of alloys and composites.	**K2**
CO3	Students will be able to understand the properties and application of new materials.	**K1**
CO4	To identify, formulate and solve metallurgical engineering problems in terms of Mathematical concepts.	**K2**
CO5	To be familiar with the mathematical ability to design and conduct experiments, interpret and analyse data, and generating correlation of obtained results.	**K3**

Course Outcomes		**BL**
Course 16 -Universal Human Values (KVE301)		
CO	**Course Outcome/ Unit**	
CO1	To acquaint the students with legacies of constitutional development in India and help those to understand the most diversified legal document of India and philosophy behind it.	K2
CO2	To make students aware of the theoretical and functional aspects of the Indian Parliamentary System.	K2
CO3	To channelize students' thinking towards basic understanding of the legal concepts and its implications for engineers.	K2
CO4	To acquaint students with latest intellectual property rights and innovation environment with related regulatory framework.	K2
CO5	To make students learn about role of engineering in business organizations and e - governance.	K3

Course Outcomes		**BL**
Course 17 -Electromagnetic Field Theory (KEE301)		
	Course Outcome/ Unit	
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.	K_3
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	K_4
CO3	Understand the concept of static magnetic field, magnetic scalar and vector potential	K_4
CO4	Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	K_4
CO5	Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	K_3

Course Outcomes		**BL**
Course 18 -Electrical Mesaurements & Instrumentation (KEE302)		
CO	**Course Outcome/ Unit**	
CO1	Evaluate errors in measurement as well as identify and use different types of instruments for the measurement of voltage, current, power and energy.	K_1
CO2	Display the knowledge of measurement of electrical quantities resistance, inductance and capacitance with the help of bridges.	K_2
CO3	Demonstrate the working of instrument transformers as well as calculate the errors in current and potential transformers.	K_2
CO4	Manifest the working of electronic instruments like voltmeter, multi-meter, frequency meter and CRO.	K_2
CO5	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.	K_3

Course Outcomes		**BL**
Course 19 -Basic Signal & System (KEE303)		
CO	**Course Outcome/ Unit**	

CO1	Represent the various types of signals & systems and can perform mathematical operations on them.	K_2
CO2	Analyze the response of LTI system to Fourier series and Fourier transform and to evaluate their applications to network analysis.	K_4
CO3	Analyze the properties of continuous time signals and system using Laplace transform and determine the response of linear system to known inputs.	K_4
CO4	Implement the concepts of Z transform to solve complex engineering problems using difference equations.	K_3
CO5	Develop and analyze the concept of state-space models for SISO & MIMO system.	K_4

Course Outcomes		**BL**
20 -Analog Electronics Lab (KEE351)		
	Course Outcome/ Unit	
CO1	Understand the characteristics and applications of the Semiconductor devices.	K_2, K_3
CO2	Draw the characteristics of BJT, FET and MOSFET.	K_2, K_4
CO3	Understand the parameters of Operational Amplifier and instrumentation Amplifier with their applications.	K_2, K_4
CO4	Understand the V-I characteristics of Power devices like SCR, TRIAC.	K_2, K_4

Course Outcomes		**BL**
21 -Electrical Mesurements and Instrumention Lab (KEE352)		
CO	**Course Outcome/ Unit**	
CO1	Understand the importance of calibration of measuring instruments.	K2
CO2	Demonstrate the construction and working of different measuring instruments.	K3
CO3	Demonstrate the construction and working of different AC and DC bridges, along with their applications.	K3
CO4	Ability to measure electrical engineering parameters like voltage, current, power & phase difference in industry as well as in power generation, transmission and distribution sectors.	K2
CO5	Capability to analyze and solving the variety of problems in the field of electrical measurements.	K2

Course Outcomes		**BL**
22 -Electrical Workshop (KEE353)		
	Course Outcome/ Unit	
CO1	Perform various types of Electrical connections.	K_3
CO2	Develop small circuits on PCB	K_6
CO3	Differentiate between various electrical wires, cables and accessories.	K_3
CO4	Demonstrate the layout of electrical substation & various safety measures.	K_2
CO5	Acquire knowledge of substation, various electrical equipment, high voltage testing of electrical equipment, and flashover voltage testing of insulators.	K_3

Course Outcomes		**BL**
Course 23 -Computer System Security (KNC301)		
CO	**Course Outcome/ Unit**	
CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K1 & K2
CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K2
CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K3
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K4
CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K5 & K6

DEPARTMENT OF ELECTRICAL AND ELECTRONICES ENGINEERING	
CO	**EVEN SEMESTER:**

8th Sem

Course Outcomes		**BL**
Course 1 - PROJECT MANAGEMENT & ENTREPRENEURSHIP(KHU 802)		
	Course Outcome/ Unit	
CO1	Understand project characteristics and various stages of a project.	**K1**
CO2	Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic.	**K1**
CO3	Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.	**K2**
CO4	Apply the risk management plan and analyse the role of stakeholders.	**K1**
CO5	Understand the contract management, Project Procurement, Service level Agreements and productivity.	**K2**

Course Outcomes	**BL**
Course 2 - QUALITY MANAGEMENT(KOE 085)	

	Course Outcome/ Unit	BL
CO1	To understand the concept of Quality	**K1**
CO2	To understand the Implication of Quality on Business	**K1**
CO3	To Implement Quality Implementation Programs	**K2**
CO4	To have exposure to challenges in Quality Improvement Programs	**K2**
CO5	Develop research skills that will allow them to keep abreast of changes in the field of Quality Management	**K2**

Course Outcomes		**BL**
Course 3 -DIGITAL AND SOCIAL MEDIA MARKETING KOE 094		
	Course Outcome/ Unit	
CO1	Students will understand what is digital Marketing ,what are trends for shift to Digital Marketing	**K1,K2**
CO2	What is Social Media Marketing, What is Blogging, how to create a Blog , SEO	**K2**
CO3	Mobile Marketing,Vidoe Marketing, SEO,Social media Marketing	**K1**
CO4	How to design Social Success , what is PR , How digital Marketing adding Value	**K2**
CO5	Digital Innovation and Trends, Digital transformation framework, trends in digital marketing .	**K2**
Course Outcomes		**BL**
Course 4 – PROJECT II (KEN 851)		
	Course Outcome/ Unit	
CO1	Work effectively as an individual and member of the team to solve complex civil engineeringproblems	**K1**
CO2	Apply engineering knowledge to solve real life problems and involve in self- learning process	**K3**
CO3	Apply modern tools for analysis and design of complex engineeringproblems	**K4**
CO4	Develop ethical solutions of engineeringproblems takinginto account its impact on society, environment and sustainability	**K2**
CO5	Compose and present detailed project report of his/ her workand defend effectively.	**K2**

6th Sem

Course Outcomes		**BL**
Course 5 - Power System-II (KEE601)		
	Course Outcome/ Unit	
CO1	Identify power system components on one line diagram of power system and its representation including the behaviour of the constituent components and sub systems and Analyse a network under both balanced and unbalanced fault conditions and design the rating of circuit breakers.	K4
CO2	Perform load flow analysis of an electrical power network and interpret the results of the analysis.	K4
CO3	Describe the concept of travelling waves in transmission lines and use the travelling wave theory to determine the over voltage caused by surge propagation in transmission networks.	K4
CO4	Assess the steady state and transient stability of the power system under various conditions.	K4
CO5	Describe Operating Principle of a relay and classify them according to applications. Explain working principle of Circuit breaker and phenomenon of arc production and quenching.	K3

Course Outcomes		**BL**
Course 6 - Microprocessor and Microcontroller (KEE602)		
	Course Outcome/ Unit	
CO1	Demonstrate the basic architecture of 8085 & 8086 microprocessors	K2
CO2	Illustrate the programming model of microprocessors & write program using 8085 microprocessor	K3
CO3	Interface different external peripheral devices with 8085 microprocessor	K3
CO4	Comprehend the architecture of 8051 microcontroller	K2
CO5	Compare advance level microprocessor & microcontroller for different applications	K4

Course Outcomes		**BL**
Course 7 - Power Electronics (KEE603)		
	Course Outcome/ Unit	
CO1	Demonstrate the characteristics as well as the operation of BJT, MOSFET, IGBT, SCR, TRIAC and GTO and identify their use in the power switching applications.	K4
CO2	Comprehend the non-isolated DC-DC converters and apply their use in different Power electronics applications.	K3
CO3	Analyze the phase controlled rectifiers and evaluate their performance parameters.	K5
CO4	Apprehend the working of single-phase ac voltage controllers, cyclo-converters and their various applications.	K3
CO5	Explain the single-phase and three phase bridge inverters differentiate between CSI and VSI and apply PWM for harmonic reduction.	K4

Course Outcomes		**BL**
Course 8 - Liner Integrated Circuit (KEN061)		
	Course Outcome/ Unit	

CO1	Analyze integrated circuit designed by BJT.	K4
CO2	Design the higher order filters with Op-Amp.	K3
CO3	Use the CMOS to make digital integrated circuits	K3
CO4	Comprehend the non-linear application of Op-Amp.	K3
CO5	Understand the 555 Timer and PLL.	K2

Course Outcomes		**BL**
Course 9 - IDEA TO BUSINESS MODEL (KOE060)		
	Course Outcome/ Unit	
CO1	This course can motivate students to have an overall idea how to start and sustain a business enterprise.	K1
CO2	The students will learn basics of choosing an idea of a business model.	K1
CO3	The core areas of choosing a business model are encompassed with Entrepreneurship development, PPC & communication system. The students will thus develop basic competencies how to run a business enterprise.	K1 & K2

Course Outcomes		**BL**
Course 10 - Power System-II Lab (KEE651)		
	Course Outcome/ Unit	
CO1	Test various relays for different characteristics and compare with the performance characteristics provided by manufacturers.	K4
CO2	Select the power system data for load-flow and fault studies and to develop a program to solve power flow problem using NR and GS methods	K6
CO3	Analyze various types of short circuit faults	K4
CO4	Demonstrate different numerical integration methods and factors influencing transient stability	K3
CO5	Determine the effect of load in long transmission line	K3
Course Outcomes		**BL**
Course 11 - Microprocessor and Microcntroler Lab (KEE652)		
	Course Outcome/ Unit	
CO1	Study of microprocessor system	K2
CO2	Development of flow chart for understanding the data flow	K3
CO3	Learning assembly language to program microprocessor based system	K3
CO4	Interfacing different peripheral devices with the microprocessor	K4
CO5	Building logic for microprocessor based system	K4

Course Outcomes		**BL**
Course 12 - Power Electronices Lab (KEE652)		
	Course Outcome/ Unit	
CO1	Demonstrate the characteristics and triggering of IGBT, MOSFET, Power transistor and SCR.	K3
CO2	Analyze the performance of single phase fully controlled bridge rectifiers under different loading conditions.	K4
CO3	Develop simulation models of power electronic circuits.	K5

Course Outcomes		**BL**
Course 13 -Constitution of India, Law and Engineering (KNC601)		
	Course Outcome/ Unit	
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	**K2**
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	**K2**
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	**K2**
CO4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	**K2**
CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	**K2**

4th Sem

Course Outcomes		**BL**
Course 14 - Math-IV (KAS402)		
	Course Outcome/ Unit	
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.	K_3
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	K_4
CO3	Understand the concept of static magnetic field, magnetic scalar and vector potential	K_4

CO4	Understand the forces due to magnetic field, magnetization, magnetic boundary conditions and inductors.	K_4
CO5	Understand displacement current, time varying fields, propagation and reflection of EM waves and transmission lines.	K_3

Course Outcomes		**BL**
Course 15 - Technical Communication (KAS401)		
	Course Outcome/ Unit	
CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers	K2
CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	K2
CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	K2
CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	K4
CO5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	K4

Course Outcomes		**BL**
Course 16 - Digital electronices (KEE401)		
	Course Outcome/ Unit	
CO1	Apply concepts of Digital Binary System and implementation of Gates.	K_3
CO2	Analyze and design of Combinational logic circuits.	K_4
CO3	Analyze and design of Sequential logic circuits with their applications.	K_4
CO4	Implement the Design procedure of Synchronous & Asynchronous Sequential Circuits.	K_3
CO5	Apply the concept of Digital Logic Families with circuit implementation.	K_3

Course Outcomes		**BL**
Course 17 - Electrical Machines-I (KEE402)		
	Course Outcome/ Unit	
CO1	Analyze the various principles & concepts involved in Electromechanical Energy conversion.	K_4
CO2	Demonstrate the constructional details of DC machines as well as transformers, and principle of operation of brushless DC motor, Stepper and DC Servo motors.	K_2
CO3	Evaluate the performance and characteristics of DC Machine as motor and as well as generator.	K_4
CO4	Evaluate the performance of transformers, individually and in parallel operation.	K_4
CO5	Demonstrate and perform various connections of three phase transformers.	K_3

Course Outcomes		**BL**
Course 18 - Network Analysis and Synthesis (KEE403)		
	Course Outcome/ Unit	
CO1	Apply the knowledge of basic circuital law, nodal and mesh methods of circuit analysis and simplify the network using Graph Theory approach.	K_3
CO2	Analyze the AC and DC circuits using Kirchhoff's law and Network simplification theorems.	K_4
CO3	Analyze steady-state responses and transient response of DC and AC circuits using classical and Laplace transform methods.	K_4
CO4	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.	K_4
CO5	Synthesize one port network and analyze different filters.	K_4

Course Outcomes		**BL**
Course 19 - Circiut Simulation Lab (KEE451)		
	Course Outcome/ Unit	
CO1	Apply the knowledge of basic circuital law, nodal and mesh analysis for given circuit.	K2
CO2	Analysis of the AC and DC circuits using simulation techniques.	K3
CO3	Analysis of transient response of AC circuits.	K3
CO4	Evaluation and analysis of two-port network parameters.	K2
CO5	Estimation of parameters of different filters.	K2

Course Outcomes		**BL**
Course 20 -Electrical Machine-I Lab (KEE452)		
	Course Outcome/ Unit	
CO1	Analyze and conduct basic tests on DC Machines and single-phase Transformer	K2
CO2	Obtain the performance indices using standard analytical aswell as graphical methods.	K3
CO3	Determine the magnetization, Load and speed-torque characteristics of DC Machines.	K3
CO4	Demonstrate procedures and analysis techniques to perform electromagnetic and electromechanical tests on electrical machines.	K2

Course Outcomes		**BL**
Course 21 -Digital Electronic Lab (KEE453)		
	Course Outcome/ Unit	

CO1	Understanding of Digital Binary System and implementation of Gates.	K_2 ,K_3
CO2	Design the Sequential circuits with the help of combinational circuits and feedback element.	K_3,K_4
CO3	Design data selector circuits with the help of universal Gates.	K_3,K_4
CO4	Design the counters with the help of sequential circuit and basic Gates.	K_3,K_4
CO5	Implement the projects using the digital ICs and electronics components.	K_3,K_5

Course Outcomes		**BL**
Course 22 -Python Programming (KNC402)		
	Course Outcome/ Unit	
CO1	To read and write simple Python programs.	K1,L2
CO2	To develop Python programs with conditionals and loops.	K1,K4
CO3	To define Python functions and to use Python data structures –- lists, tuples,dictionaries	K3
CO4	To do input/output with files in Python	K2
CO5	To do searching ,sorting and merging in Python	

Department of Mechanical Engineering

Course Outcomes

COURSE OUTCOME		BL
COURSE 1 - THERMODYNAMICS:(KME301)		
	COURSE OUTCOME/UNIT	
CO1	Use thermodynamic terminology correctly.	K1
CO2	Explain fundamental thermodynamic properties	K2
CO3	Derive and discuss the first and second laws of thermodynamics	K3
CO4	Solve problems using the properties and relationships of thermodynamic fluids	K2
CO5	Analyse basic thermodynamic cycles	K3

COURSE OUTCOME		BL
COURSE 2 - FLUID MECHANICS AND FLUID MACHINES (KME302)		
	COURSE OUTCOME/UNIT	
CO1	Possess a sound knowledge of fundamental properties of fluids and fluid continuum and types of fluid flow.	K3
CO2	Compute and solve problems on hydrostatics, including practical applications	K4
CO3	Apply principles of mathematics to represent kinematic concepts related to fluid flow	K3
CO4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications.	K3
CO5	Compute the discharge through pipes can critically analyze the performance of pumpsand turbines	K2

COURSE OUTCOME		BL
COURSE 3 - MATERIALS ENGINEERING (KME303)		
	COURSE OUTCOME/UNIT	
CO1	Student will be able to identify crystal structures for various materials and understand the defects in such structures	K3
CO2	Understand how to tailor material properties of ferrous and non-ferrous alloys.	K4
CO3	How to quantify mechanical integrity and failure in materials	K3
CO4	Acquire and develop the necessary background and skills for successful careers in the materials-related industries	K3
CO5	Furthermore, after completing the program, the student should be well prepared for Management positions in industry or continued education toward a graduate degree	K2

COURSE OUTCOME		BL
COURSE 4 - ENERGY SCIENCE AND ENGINEERING (KOE 033)		
	COURSE OUTCOME/UNIT	
CO1	To Explain the basic principles of various renewable energy conversion processes and devices used therein.	3
CO2	To expose the student to solar thermal, solar photovoltaic	2
CO3	To expose the student to Geothermal Energy, Magneto-hydrodynamics (MHD) and fuel cell	2
CO4	To expose the student to wind, tidal and renewable energy resources, conversion technologies, processes, systems and devices, and equip the student to take up projects in those areas.	2
CO5	To expose the student to biomass renewable energy resources	2

COURSE OUTCOME		BL
COURSE 1 - HEAT AND MASS TRANSFER (KME 501)		
	COURSE OUTCOME/UNIT	
CO1	Understand the fundamentals of heat and mass transfer	K3
CO2	Apply the concept of steady and transient heat conduction	K4
CO3	Apply the concept of thermal behavior of fins	K3

CO4	Apply the concept of forced and free convection.	K3
CO5	Conduct thermal analysis of heat exchangers	K2

COURSE OUTCOME		
COURSE 2 - STRENGTH OF MATERIAL (KME 502)		
	COURSE OUTCOME/UNIT	BL
CO1	Understand the concept of stress and strain under different conditions of loading	K3
CO2	Determine the principal stresses and strains in structural members	K4
CO3	Determine the stresses and strains in the members subjected to axial, bending and torsional loads	K3
CO4	Apply the concepts of stresses and strain in solving problems related to springs, column and pressure vessels	K3
CO5	Calculate the slope, deflection and buckling of loaded members	K2

COURSE OUTCOME		
COURSE 3 - INDUSTRIAL ENGINEERING (KME 503)		
	COURSE OUTCOME/UNIT	BL
CO1	Understand the concept of production system, productivity, facility and process planning in various industries	K3
CO2	Apply the various forecasting and project management techniques	K4
CO3	Apply the concept of break-even analysis, inventory control and resource utilization using	K3
CO4	Apply principles of work study and ergonomics for design of work systems	K3
CO5	Formulate mathematical models for optimal solution of industrial problems using linear programming approach	K2

COURSE OUTCOME		BL
COURSE 4 - I C ENGINE, FUEL AND LUBRICATION (KME 054)		
	COURSE OUTCOME/UNIT	
CO1	Explain the working principle, performance parameters and testing of IC Engine	K3
CO2	Understand the combustion phenomena in SI and CI engines and factors influencing combustion chamber design	K4
CO3	Understand the essential systems of IC engine and latest trends and developments in IC Engines.	K3
CO4	Understand the effect of engine emissions on environment and human health and methods of reducing it.	K3
CO5	Apply the concepts of thermodynamics to air standard cycle in IC Engines	K2

COURSE OUTCOME		BL
COURSE 5 - ADVANCE WELDING (KME 055)		
	COURSE OUTCOME/UNIT	
CO1	Understand the physics of arc welding process and various operating characteristics of welding power source.	K3
CO2	Analyse various welding processes and their applications	K4
CO3	Apply the knowledge of welding for repair & maintenance, along with the weldability of different materials	K3
CO4	Apply the concept of quality control and testing of weldments in industrial environment	K3
CO5	Evaluate heat flow in welding and physical metallurgy of weldments	K2

COURSE OUTCOME		BL
COURSE 1 - HYBRID VEHICLE PROPULSION (KAU 072)		
	COURSE OUTCOME/UNIT	
CO1	Understand the basics of the hybrid electric vehicles and it's types	K3
CO2	Understand the types of drive trains used in hybrid vehicles	K4
CO3	Understand the propulsion units used in Hybrid Vehicles and their efficiency	K3
CO4	Understand the requirements and devices of energy storage used in hybrid vehicles	K3
CO5	Understand the concept of downsizing of IC engines in case of hybrid vehicles	K2

COURSE OUTCOME		BL
COURSE 2 - POWER PLANT ENGINEERING KME 076)		
	COURSE OUTCOME/UNIT	
CO1	Understand the different sources of power generation and their impact on environment	K3
CO2	Understand the elements of power generation using conventional and non- conventional energy sources	K4
CO3	Understand the concepts of electrical systems used in power plants	K3
CO4	Apply the basic concepts of thermodynamics to measure the performance of different power plants.	K3
CO5	Determine the performance of power plants based on load variations	K2

COURSE OUTCOME		BL
COURSE 3 -RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING **(KHU701)**		
	COURSE OUTCOME/UNIT	
CO1	Students can understand the definitions, concepts and components of Rural Development	K3
CO2	Students will know the importance, structure, significance, resources of Indian rural economy.	K4
CO3	will have a clear idea about the area development programmes and its impact	K3
CO4	Students will be able to acquire knowledge about rural entrepreneurship	K3
CO5	Students will be able to understand about the using of different methods for human resource planning	K2

BME301- THERMODYNAMICS

Course Outcomes:		BL
CO1	After completing this course, the students will be able to apply energy balance to systems and control volumes, in situations involving heat and work Interactions.	K1
CO2	Students can evaluate changes in thermodynamic properties of substances.	K2
CO3	The students will be able to evaluate the performance of energy conversion devices.	K1
CO4	The students will be able to differentiate between high grade and low-grade energies.	K3
CO5	The students will be able to differentiate between high grade and low-	K2

BME302- FLUID MECHANICS AND FLUID MACHINES		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to		
CO 1	Understand the application of mass and momentum conservation laws for fluid flows.	**K2**
CO 2	Understand the importance of dimensional analysis.	**K2**
CO 3	Evaluate the velocity and pressure variations in various types of simple flows.	**K3**
CO 4	Mathematically analyze the flow in water pumps and turbines.	**K3**
CO 5	Understand about the functioning of centrifugal and reciprocating pumps.	**K2**

BME303- MATERIALS ENGINEERING

Course Outcome (CO)		BL
At the end of course , the student will be able to		
CO 1	Students will be able to identify the crystal structure and measure the mechanical properties of materials.	**K2**
CO 2	Students will be able to test the various failures of materials.	**K2**
CO 3	Students will be able to identify the mechanical properties based on composition of micro-constituents depicted in the phase-diagram.	**K3**
CO 4	Students will understand the concept of improving the mechanical properties through heat treatment.	**K3**
CO 5	Students will learn the structure and properties of alloys and composites.	**K2**

BME351- FLUID MECHANICS LAB		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to		
	Understand the principles and performance characteristics of flow and thermal devi	**K2**
	Know about the measurement of the fluid properties	**K1**
	Understand and analyze various properties of fluids	**K3**
	Evaluate the performance characteristics of fluid/thermal machinery	**K3**
	Evaluate the velocity and pressure variations in various types of simple flows.	**K3**

	BME352- MATERIALS TESTING LAB	
Course Outcome (CO)		
At the end of course , the student will be able to		**BL**
	Students will be able to perform different destructive and non-destructive testing methods to measure various mechanical properties.	K2
	Students will be able to analyse the effect of different heat-treatment processes on the Hardness.	K3
	Students will be able to simulate the material using simulating software / measure the mechanical properties of 3-D printed components	K2

BME353- COMPUTER AIDED MACHINE DRAWING-I LAB

	At the end of course , the student will be able to	**BL**
CO 1	Understand and apply 2D software to develop a part model	K2
CO 2	Understand about temporary and permanent fasteners	K3
CO 3	Understand the need for free hand sketching, Free hand sketching of foundation bolts etc.	K2
CO 4	Create assembly drawing of simple machine elements like rigid or flexible coupling	K3
CO 5	Create 2D drawings and assemblies of various machine components	K2

SEMESTER-IV

BME401- APPLIED THERMODYNAMICS

	At the end of course , the student will be able to	BL
CO 1	After completing this course, the students will get a good understanding of various practical power cycles and heat pump cycles.	K2
CO 2	They will be able to analyze energy conversion in various thermal devices such as combustors, air coolers, nozzles, diffusers, steam turbines and reciprocating compressors.	K3
CO 3	They will be able to understand phenomena occurring in high speed compressible flows.	K2
CO 4	To investigate the effectiveness of energy conversion process in mechanical power generation for the benefit of mankind.	K3
CO 5	To communicate effectively the concepts of internal combustion engines and try to think beyond curriculum in alternative sources of energy.	K2

BME402- ENGINEERING MECHANICS & STRENGTH OF MATERIAL

Course Outcomes: The student will be able to		BL
CO1	Understand the force systems and application of force equilibrium to various two-dimensional problems.	K3
CO2	Understand the concept of stress and strain under different loading conditions.	K3
CO3	Determine the principal stresses and strains in structural members	K3
CO4	Understand and determine the stresses, slope, and deflection of the transversely loaded members	K3
CO5	Apply the concepts of stresses and strain in solving problems related to springs, buckling of columns and thin and thick cylinders.	K3

BME403- MANUFACTURING PROCESSES

Course Outcomes: The student will be able to		BL
CO 1	Students will learn the various conventional manufacturing processes / casting and forming processes.	K3
CO 2	Students will comprehend the knowledge of grinding and super finishing processes.	K2
CO 3	Students will understand the concepts of metal joining processes.	K3
CO 4	Students will learn the concepts of unconventional machining processes.	K2
CO 5	Students will understand the concepts of metal cutting and CNC machining	K2

BME451- APPLIED THERMODYNAMICS LAB

Course Outcomes: The student will be able to		BL
CO 1	To understand the principles of various boilers:	K2
CO 2	To understand the basic principles IC engines and determination of various performance parameters of IC Engines:	K3
CO 3	To understand the principles of steam engine and Steam & Gas Turbine:	K2

BME452- MANUFACTURING PROCESSES LAB

Course Outcomes: The student will be able to		BL
CO 1	Students will be able to make the component using casting and finishing methods.	K2
CO 2	Students will be able to make the component using metal cutting / unconventional machining methods.	K3
CO 3	Students will be able to make the component using metal joining processes.	K2

BME453- COMPUTER AIDED MACHINE DRAWING-II LAB

At the end of course , the student will be able to		BL
CO 1	Understand and apply 3D software to develop a part model	K2
CO 2	Understand conventional representation of machine components, and welded joints	K2
CO 3	Understand and apply the basis of fit or limit system	K2
CO 4	Understand about Plummer Block Bearing, Machine Vice, Screw Jack, Engine Stuffing box.	K2K3
CO 5	Create 3D part models and assemblies of various machine components	K2

DEPARTMENT OF CIVIL ENGINEERING

BCE301- ENGINEERING MECHANICS

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Use scalar and vector analytical techniques for analyzing forces in statically determinate structures	K2
CO 2	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems.	K2
CO 3	Apply basic knowledge of mathematics and physics to solve real-world problems.	K2
CO 4	Apply basic dynamics concepts – force, momentum, work and energy.	K2K3
CO 5	Apply Newton's laws of motion for solving the problems.	K2

BCE302- SURVEYING & GEOMATICS

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Apply concepts of survey to prepare plan, profile, and cross-section for computations.	K2
CO 2	Calculate, design and layout horizontal and vertical curves.	K2
CO 3	Operate modern survey instrument for recording of data for scientific uses.	K2
CO 4	Apply principles of photogrammetry for surveying.	K2K3
CO 5	Apply principles of Remote Sensing and Digital Image Processing for Civil Engineering problems.	K2

BCE303- FLUID MECHANICS

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Explain principles of fluid statics, kinematics and dynamics.	K2
CO 2	Explain the terms used in fluid mechanics to describe fluid and flow properties.	K2
CO 3	Explain classifications of fluid flow.	K2
CO 4	Apply the continuity, momentum and energy principles	K2K3
CO 5	Apply dimensional analysis	K2

BCE401- MATERIALS, TESTING & CONSTRUCTION PRACTICES

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Explain various building materials based on their properties.	K1
CO 2	Explain use of non-conventional civil engineering materials.	K2
CO 3	Select suitable type of flooring and roofing in the construction process.	K2
CO 4	Characterize the concept of plastering, pointing and various other building services.	K2
CO 5	Exemplify the various building services and modern construction practices.	K3

BCE402- INTRODUCTION TO SOLID MECHANICS

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Describe the concepts and principles of stresses and strains.	K1
CO 2	Calculate the deflections at any point on a beam subjected to a combination of loads	K2
CO 3	Analyze the given beam section for stresses.	K2
CO 4	Analyze structural members subjected to axial loading and combined stresses	K2
CO 5	Analyze the behavior of shafts, and cylinders against loads.	K3

BCE403- HYDRAULIC ENGINEERING & MACHINES

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Apply their knowledge of fluid mechanics in addressing problems in open channels.	K1
CO 2	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.	K2
CO 3	Apply impulse momentum equation for estimating thr performance of pumps.	K2
CO 4	Draw performance curve for the turbines.	K2

BCE353- FLUID MECHANICS LAB

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Understand the knowledge about the basic terminologies	K1
CO 2	Will able to find out various conditions related to stability of floating bodies.	K2
CO 3	Understand the knowledge about the fluid motion and will be able to distinguish between them based on Reynolds no.	K2
CO 4	Apply Bernoulli's equation in flow measuring devices together with their calibration	K2
CO 5	Understand sources of major and minor losses and in practical conditions	K3

BCE351- BUILDING PLANNING & DRAWING LAB

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Develop drawings of different components of a building.	K1
CO 2	Design and prepare functional drawings for buildings as per norms	K2
CO 3	Develop drawings showing the interconnectivity of functional components of buildings along with service layouts.	K2

BCE352- SURVEYING & GEOMATICS LAB

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Measure of horizontal and vertical angles using theodolite and determination of elevation for base in accessible objects.	K1
CO 2	Determine the tachometric constants using horizontal and inclined line of sights.	K2
CO 3	Construct simple and compound curves with angular methods using theodolite.	K2

BCE353- FLUID MECHANICS LAB

	Course Outcomes: At the end of this course the student will be able to-	BL
CO 1	Determine the fluid pressure and use various devices for measuring fluid pressure.	K1
CO 2	Calculate hydrostatic force and use of law of conservation mass to fluid flow.	K2

CO 3	Apply Bernoulli's equation to fluid flow problems and boundary layer theory to determine lift and drag forces on a submerged body.	K5
CO 4	Apply appropriate equations and principles to analyze pipe flow problems.	K4
CO 5	Use of different fluid flow measuring devices.	K3

BCE451- MATERIAL TESTING LAB

Course Outcomes: Upon the completion of the course the student would be able to		**BL**
CO 1	Determine toughness value of industrial specimens.	K1
CO 2	Analyze various heat treatment methods for a given specimen to observe mechanical properties and grain size.	K2
CO 3	Find surface or subsurface defects relevant to almost all manufacturing industries.	K5
CO 4	Evaluate the mechanical properties like draw ability, endurance limit of a steel specimen necessary for material selection in design and development	K4

BCE452- SOLID MECHANICS LAB

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Describe the mechanical behaviour of engineering materials subjected to various types of stresses and compute the resulting strain and strain energy.	K1
CO 2	Analyse the bending of various types of beams under static loading conditions and compute the shear stress distribution for different cross sections of beams.	K2
CO 3	Show knowledge of principal planes, stresses and strains and analyse the elastic deformation of members and apply different theories of elsatic failures.	K2
CO 4	Compute the torsion for the circular shaft and analyse the crippling load and equivalent length for various types of columns of different end conditions.	K3
CO 5	Compute the deflection of beams and shafts under static loading and stresses in thin walled cylindrical and spherical vessels.	K3

BCE453- HYDRAULICS & HYDRAULIC MACHINE LAB

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Apply the knowledge in finding friction factor for different pipes and also calibrate the measuring tank	K1
CO 2	Determine the rate of flow by different setup	K2
CO 3	Interpret the output results obtained from impact of jet, pumps, turbine to check the performance	K2

KCE070 Railway, Waterway and Airway Engineering

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Explain the importance of railway infrastructure.	K1
CO 2	Identify the factors governing design of railway infrastructures.	K2
CO 3	Analysis and design the railway track system.	K2
CO 4	Understand the concepts of airport engineering and design components of airport.	K3
CO 5	Associate with the concepts of water transport system.	K3

KCE077 Geo-synthetics and Reinforced Soil Structures

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Identify the type of Geosynthetic and their relevance.	K1
CO 2	Analyze &compute different properties of Geosynthetics.	K2
CO 3	Understand the emerging trends of Geosynthetic in geotechnical applications.	K2
CO 4	Design the Reinforced Earth Walls using Geosynthetic material.	K3
CO 5	Design the Reinforced Foundation using Geosynthetic materials.	K3

KCE 501 GEOTECHNICAL ENGINEERING

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Classify the soil and determine its Index properties.	K1
CO 2	Evaluate permeability and seepage properties of soil.	K2
CO 3	Interpret the compaction and consolidation characteristics & effective stress concept of soil.	K2
CO 4	Determine the vertical and shear stress under different loading conditions and explain the phenomenon of soil liquefaction.	K3
CO 5	Interpret the earth pressure and related slope failures	K3

KCE502 STRUCTURAL ANALYSIS

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Explain type of structures and method for their analysis.	K1
CO 2	Analyze different types of trusses for member forces.	K2
CO 3	Compute slope and deflection in determinate structures using different methods.	K2
CO 4	Apply the concept of influence lines and moving loads to compute bending moment and shear fo	K3
CO 5	Analyze determinate arches for different loading conditions.	K3

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KCE 503 QUANTITY ESTIMATION AND CONSTRUCTION MANAGEMENT

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Understand the importance of units of measurement and preliminary estimate for administrative approval of projects	K1

CO 2	Understand the contracts and tender documents in construction projects.	K2
CO 3	Analyze and assess the quantity of materials required for civil engineering works as per specifications.	K2
CO 4	Evaluate and estimate the cost of expenditure and prepare a detailed rate analysis report.	K3
CO 5	Analyze and choose cost effective approach for civil engineering projects.	K3

	KCE-551 CAD LAB	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	To learn the programming of MATLAB to analyze and design structures.	K1
CO 2	To generate and analyze Object-oriented intuitive 2D/3D graphic model using STAAD.Pro.	K2
CO 3	To understand two dimensional finite element analysis of deformation and stability in geotechnical engineering using PLAXIS software.	K2
CO 4	To generate an ability to identify, formulate, analyze and design engineering problems for structural analysis using software's like STAAD PRO / STRUDS / ETAB / STRAP.	K3
CO 5	To introduce the finite element program using software like SAP 2000 which performs the static or dynamic, linear or nonlinear analysis of structural systems	K3

	KCE - 553: QUANTITY ESTIMATION AND MANAGEMENT LAB	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	To understand and estimate the quantities of various items of the building	K1
CO 2	To comprehend the knowledge of composing the contracts and tenders	K2
CO 3	To find out the usage of various management and network techniques in the construction industry	K2
CO 4	To study the various construction related tools and equipment	K3
CO 5	To interpret the value of money in past, present and future time..	K3

	KCE 051 CONCRETE TECHNOLOGY	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Understand the properties of constituent material of concrete.	K1
CO 2	Apply admixtures to enhance the properties of concrete.	K2
CO 3	Evaluate the strength and durability parameters of concrete.	K2
CO 4	Design the concrete mix for various strengths using difference methods.	K3
CO 5	Use advanced concrete types in construction industry.	K3

	KCE 052 MODERN CONSTRUCTION MATERIALS	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Understand the use of modern construction materials.	K1
CO 2	Use geosynthetics and bituminous materials in constructions.	K2
CO 3	Apply knowledge of modern materials in production of variety of concrete.	K2
CO 4	Apply knowledge of composites and chemicals in production of modern concrete.	K3
CO 5	Use modern water proofing and insulating materials in constructions.	K3

	KCE-053 : OPEN CHANNEL FLOW	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Apply knowledge of fluid flow for designing of channel sections.	K1
CO 2	Analyze the gradually varied flow in channel section.	K2
CO 3	Analyze the rapidly varied flow in channel sections.	K2
CO 4	Apply numerical methods for profile computation in channels.	K3
CO 5	Design channels for sub critical and super critical flows.	K3

	KCE 054 ENGINEERING GEOLOGY	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Understand the scope of geological studies.	K1
CO 2	Understand the rocks and its engineering properties.	K2
CO 3	Understand the minerals and constituents of rocks.	K2
CO 4	Understand the rock deformations, their causes effects and preventive measures.	K3
CO 5	Understand the ground water reserves, Geophysical exploration methods and site selection for mega projects.	K3

	KCE055 ENGINEERING HYDROLOGY	
	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Understand the basic concept of hydrological cycle and its various phases.	K1
CO 2	Understand the concept of runoff and apply the knowledge to construct the hydrograph.	K2
CO 3	Apply the various methods to assess the flood.	K2
CO 4	Assess the quality of various forms of water and their aquifer properties.	K3
CO 5	Understand the well hydraulics and apply ground water modelling techniques.	K3

KCE 056 SENSOR AND INSTRUMENTATION TECHNOLOGIES FOR CIVIL ENGINEERING APPLICATIONS

	Course Outcomes: At the end of this course the student will be able to-	**BL**
CO 1	Analyze the errors during measurements	K1
CO 2	Describe the measurement of electrical variables	K2
CO 3	Describe the requirements during the transmission of measured signals	K2
CO 4	Construct Instrumentation/Computer Networks	K3

CO 5	Suggest proper sensor technologies for specific applications CO-6 Design and set up measurement systems and do the studies	K3

KCE 057 AIR & NOISE POLLUTION CONTROL

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Understand air pollutants and their impacts.	K1
CO 2	Explain air pollution chemistry and meteorological aspects of air pollutants.	K2
CO 3	Demonstrate methods for controlling particulate air pollutants.	K2
CO 4	Demonstrate methods for controlling gaseous air pollutants.	K3
CO 5	Apply methods for controlling noise pollution.	K3

KCE 064 FOUNDATION DESIGN

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Understand various methods of Soil Exploration and its importance.	K1
CO 2	Analyze bearing capacity and settlement of soil for shallow foundation.	K2
CO 3	Design the various types of shallow foundation and understand the basics of deep foundation.	K2
CO 4	Understand the characteristics of well foundations and retaining wall.	K3
CO 5	Understand the concept of soil reinforcement.	K3

KCE 061 ADVANCE STRUCTURAL ANALYSIS

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Analyze indeterminate structure to calculate unknown forces, slope and deflections by different methods.	K1
CO 2	Apply principle of influence lines to analyze indeterminate beams and arches.	K2
CO 3	Analyze and design cable structure with their influence line diagram.	K2
CO 4	Apply basics of force and stiffness methods of matrix analysis for beams, frames and trusses.	K3
CO 5	Apply the basic of plastic analysis to analyze the structure by using different mechanism.	K3

KCE 603 ENVIRONMENTAL ENGINEERING

Course Outcomes: At the end of this course the student will be able to-		**BL**
CO 1	Assess water demand and optimal size of water mains.	K1
CO 2	Layout the distribution system & assess the capacity of reservoir.	K2
CO 3	Investigate physical, chemical & biological parameter of water.	K2
CO 4	Investigate physical, chemical & biological parameter of water.	K3
CO 5	Apply emerging technologies for treatment of waste water.	K3

Department of Biotechnology

ODD SEM (3rd and 5th)

Course outcomes- Technique in Biotechnology (KBT 301)

	COURSE OUTCOMES (CO)	**(Blooms Level)**
CO1	Understanding of working mechanism of different types of microscopy.	**L2:** Understand
CO2	Understanding of the principle of different types of chromatography techniques.	**L4** : Analyze
CO3	Understanding the processes of spectroscopy and the application in biotechnology.	**L5** : Evaluate
CO4	Different types of separation techniques for the nucleic acid and proteins.	**L4** : Analyze
CO5	Understanding the application of Biosensor in different areas.	**L2:** Understand

Course outcomes- Microbiology and Immunology (KBT 302)

	COURSE OUTCOMES (CO)	**(Blooms Level)**
CO1	To classify and explain the structure and general characteristics of microorganism.	**L1**
CO2	Understanding of the concept of viruses and virus reproduction system	**L2**
CO3	Understanding of the concept of Human body defense system.	**L3**
CO4	Regulatory mechanism of interaction between different molecules.	**L2**
CO5	Application of microbes and understanding of the different disease.	**L3**

Course outcomes- Biochemistry (KBT 303)

	COURSE OUTCOMES (CO)	**(Blooms Level)**
CO1	Understanding the structure and uses of water and Buffer	**L2:** Understand
CO2	Understanding of the structure of carbohydrates and different pathways.	**L4** : Analyze
CO3	Understanding the fatty acid and lipid formation pathways.	**L1: Understand** **L5** : Evaluate
CO4	To able to classify the amino acids and proteins on the basis of their structures.	**L4** : Analyze
CO5	Understanding the de novo and salvage pathways.	**L2:** Understand

Course outcomes- MINI PROJECT OR INTERNSHIP ASSESSMENT (KBT 354)		
COURSE OUTCOMES (CO)		(Blooms Level)
CO1	Understand and workout the project problem.	K2
CO2	Gain experience to make a project report.	K3
CO3	Acquire the necessary confidence to carry out main project in the final year.	K2

COURSE OUTCOME		
ENERGY SCIENCE AND ENGINEERING (KOE 033)		
	COURSE OUTCOME/UNIT	BL
CO1	To Explain the basic principles of various renewable energy conversion processes and devices used therein.	3
CO2	To expose the student to solar thermal, solar photovoltaic	2
CO3	To expose the student to Geothermal Energy, Magneto-hydrodynamics (MHD) and fuel cell	2
CO4	To expose the student to wind, tidal and renewable energy resources, conversion technologies, processes, systems and devices, and equip the student to take up projects in those areas.	2
CO5	To expose the student to biomass renewable energy resources	2

Course Outcomes		**BL**
Technical Communication (KAS301)		
	Course Outcome/ Unit	
CO1	Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers	**K2**
CO2	Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.	**K2**
CO3	Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.	**K2**
CO4	Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.	**K4**
CO5	It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.	**K4**

Course Outcomes		**BL**
Computer System Security (KNC301)		
	Course Outcome/ Unit	
CO1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K1 & K2
CO2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K2
CO3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.	K3
CO4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios	K4
CO5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K5 & K6

Course Outcomes		**BL**
Course: Genetic Engineering (KBT501)		
	Unit	
CO1	To be able to appraise the appropriate use of host and vector for gene cloning	K2, K5
CO2	Identification of appropriate method for DNA delivery into the host	K3
CO3	Use of gene library for screening of desired gene sequence/protein	K2, K5
CO4	Cloning process of whole organism and its application	K4
CO5	Process of recombinant protein expression, cell signaling and ethical issues related to Gene transfer	K2, K5

Course Outcomes		
Course- Fermentation Biotechnology (KBT 502)		
	Course Outcome/ Unit	**BL**
		K1, K2
CO1	Understanding of the concepts and process technologies of fermentation	
		K1, K2, K3,
CO2	Application and use of different raw materials and its use in industrial scale production.	
		K1, K2, K3
CO3	Regulatory system in the microorganism.	
		K1, K2
CO4	Strain improvement technologies and its role in Fermentation.	
	Concepts of the scale up and scale down criteria of fermentation process and production of metabolites	K1, K2, K3, K4

CO5		

Course Outcomes		
Course: Bioinformatics-I (KBT503)		BL
	Understand concepts and application of Bioinformatics, types of databases, sequence similarity, sequence patterns and profiles	K2
CO1		
	Use sequence alignment techniques, database searching, pairwise and multiple sequence alignment using various tools.	K4
CO2		
	Understand scoring matrices and its types including PAM, BLOSUM series and matrices for nucleic acid and protein sequences.	K1,K2
CO3		
	Apply phylogeny and its concepts in molecular evolution and different methods of Phylogenetic tree construction	K5
CO4		
	Understand and apply the protein structure prediction and application of bioinformatics in drug designing	K2, K5
CO5		

Course Outcomes		
Course: Metabolic Engineering (KBT054)		BL
CO1	Understanding of the concepts and process technologies of fermentation.	K1
CO2	Application and use of different raw materials and its use in industrial scale production.	K2
CO3	Regulatory system in the microorganism.	K3
CO4	Strain improvement technologies and its role in Fermentation.	K2
CO5	Concepts of the scale up and scale down criteria of fermentation process and production of metabolites	K3

Course Outcomes		
Course- Biofuels and alcohol technology (KBT055)		BL
	Course Outcome/ Unit	
CO1	Explain basic concepts of metabolism and importance of metabolic engineering.	K2
CO2	Understand the production of metabolites and its regulatory mechanism.	K2
CO3	Explain the applications, specificity and product inhibition of bioconversion.	K1, K2
CO4	Regulation of enzyme production and strain improvement.	K5

Course Outcomes		
Course- Mini Project and Internships (KBT 554)		BL
	Course Outcome/ Unit	
	Understand and workout the project problem.	
CO1		K1
		K2
CO2	Gain experience to make a project report..	
	Acquire the necessary confidence to carry out main project in the finalyear.	K1, K2
CO3		

Course Outcomes		
Course: Techniques in Biotechnology Lab (KBT351)		BL
	Unit	
	Understand the basic tools and techniques used in biology and molecular biology.	K2
CO1		
	Conduct experimental procedure to identify and measure concentration using UV-Vis Spectroscopy.	K3
CO2		
		K3
CO3	Conduct experimental analysis of protein and DNA sample by gel electrophoresis	
	Understand and conduct experiments related to chromatography.	K2, K3
CO4		
CO5	Enhance their practical knowledge and thus their employability	K5

Course Outcomes		
Course: Microbiology and Immunology Lab (KBT352)		BL
	Unit	
	• Understand and gain expertise in practical aspects of aseptic microbial techniques.	K1
CO1		
	• Conducts experiments for inoculation and microbial cell culture.	K3
CO2		
		K1, K3
CO3	• Understand and perform different microbial staining techniques.	
	• Conduct experiments for determination of blood group and Rh factor	K3
CO4		
CO5	• Conducts different immunotechnical experiments such as ELISA, Immunodiffusion and Immunoelectrophoresis.	K3

Course Outcomes		
Course: Biochemistry Lab (KBT353)		BL
	Unit	
CO1	The student will get practical knowledge of Preparation of buffers and measurement of pH	K1

CO2	Conduct experiments for determination of absorption maxima (λmax)	K3
CO3	Conduct experiments for Qualitative and quantitative analysis of carbohydrates, and proteins.	
CO4	Conducts experiments for separation of sugars, fatty acids and amino acids by chromatography	K3
CO5	Conducts experiments for gel electrophoresis of DNA	K3
	Course Outcomes	
	Course: Genetic Engineering Lab (KBT551)	**BL**
CO1	Demonstrate the isolation genetic materials	K1
CO2	Perform experiments related to cloning, ligation, restriction digestion and transformation etc.	K2
CO3	Demonstrate the Southern Blotting for identification of desired DNA in a pool DNA samples	K2
CO4	Perform the bacterial cell competent for transformation	K3
	Course Outcomes	
	Course- Fermentation Biotechnology Lab (KBT552)	**BL**
	Course Outcome/ Unit	
CO1	Demonstrate the growth pattern of E.coli.	K3
CO2	process.	K2
CO3	Demonstrate the downstream processing of fermentative products.	K3
CO4	Perform the solid state fermentation and submerged fermentation.	**K2**
	Course Outcomes	
	Course: Bioinformatics-I lab (KBT 553)	**BL**
CO1	Understand and apply knowledge for sequence retrieval from ENTREZ	K3
CO2	Understand and apply various tools to locate chromosome of a gene	K4
CO3	Understand and apply bioinformatics tools for gene retrieval using GEO program	K4
CO4	Understand and apply research article retrieval from PUBMED	K4
CO5	Understand and apply bioinformatics tools for finding ORF of a Given Sequence	K4
	EVEN SEM (4th and 6th Sem)	
	Course Outcomes	
	Course: Bioprocess Engineering I (KBT 401)	**BL**
	Unit	
CO1	Understanding of Fluid properties and their behavior and mathematical analysis	**L2:** Understand
CO2	Understanding of principle, working and application of flow measuring equipments	**L4** : Analyze
CO3	Understanding the principle of conduction and convection and application	**L5** : Evaluate
CO4	Understanding of diffusion and transient conduction.	**L4** : Analyze
CO5	Understanding the principle of mass transfer in biological system and their practical	**L2:** Understand
CO6		
	Course Outcomes	
	Course: Genetics and Molecular Biology (KBT 402)	**BL**
	Unit	
	Identification of gene and determination of sex chromosome.	**L2:** Understand
CO1		**L3** : Applying
	To be able to differentiate between DNA and RNA sequences	**L4** : Analyze L2:
CO2		Understand
	Understanding of the concept of central dogma.	**L2** : Understand L3:
CO3		Applying
	Understanding the regulatory mechanism in bacteria.	**L4** : Analyze
CO4		
	To be able to know the application of r-DNA technology.	**L2:** Understand
CO5		**L3** : Applying
	Course Outcomes	
	Course: Genetics and Molecular Biology (KBT 402)	**BL**
	Unit	
CO1	Identification of gene and determination of sex chromosome.	**L2:** Understand
		L3 : Applying
CO2	To be able to differentiate between DNA and RNA sequences	**L4** : Analyze L2: Understand
CO3	Understanding of the concept of central dogma.	**L2** : Understand L3: Applying
CO4	Understanding the regulatory mechanism in bacteria.	**L4** : Analyze
CO5	To be able to know the application of r-DNA technology.	**L2:** Understand
		L3 : Applying
	Course Outcomes	
	Course: Enzyme Engineering (KBT 403)	**BL**
	Unit	
CO1	To be able to know about enzymes and enzyme kinetics.	**L2:** Understand
		L3 : Applying
CO2	To be able to differentiate enzyme inhibition processes.	**L4** : Analyze

CO3	Understanding of Downstream processing of enzymes	**L2** : Understand L3: Applying
CO4	Understanding the role of enzyme immobilization	**L4** : Analyze
CO5	To be able to understand the Enzyme Biosensors and Enzyme reactors.	**L2:** Understand **L3** : Applying
	Course Outcomes	
	Course: Maths V (KAS 404)	**BL**
	Unit	
	Understand the concept of Fourier Transform and Z- Transformto apply for solving with the help of transform problems.	**K2 and K3**
CO1		
CO2	Remember the concept of Probability to evaluate Probability distribution.	**K1 and K3**
CO3	To analyze the concept of numerical techniques to evaluate the zero's of the function interpolation	**K4 and K5**
CO4	Apply the concept of hypothesis to evaluate various hypothesis testing	**K3 and K5**
CO5	Remember the concept of design and statistical quality control to create control charts.	**KJ1 and K6**
	Course Outcomes	BL
	Course - Universal Human Values And Professional Ethics (**KVE 401)**	
	Course Outcome/ Unit	
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society.	2.3
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co- existence of Self and Body	4,2,1
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	1,2,3
CO4	Understand the harmony in nature and existence and work out their mutually fulfilling participation in thenature.	2.4
CO5	Distinguish between ethical and unethical practices,and start working out the strategy to actualize a harmonious environment wherever they work.	5.4

	Course Outcomes	**BL**
	Python Programming (KNC402)	
	Course Outcome/ Unit	
CO1	To read and write simple Python programs.	**K1,L2**
CO2	To develop Python programs with conditionals and loops.	**K1,K4**
CO3	To define Python functions and to use Python data structures –- lists, tuples, dictionaries	**K3**
CO4	To do input/output with files in Python	**K2**
CO5	To do searching ,sorting and merging in Python	**K2,K4**

	Course Outcomes	
	Course: Bioprocess engineering II (KBT 601)	**BL**
	Unit	
		K3
CO1	Understand the kinetics of microbial growth and the associated parameters.	
	Utilize sterilization concepts necessary for proper bioreactor operation.	K2
CO2		
		K2
CO3	Discuss the basics of ideal reactor operation.	
	Explain the concept and mechanism of mass transfer in bio-processing.	K2
CO4		
	Analyze the concept of bioreactor control mechanism and identify suitable control system.	K4
CO5		
	Course Outcomes	
	Course: Plant biotechnology (KBT 602)	**BL**
	Unit	
	Understand the principle and basic requirements for plant tissue culture.	K3
CO1		
	Explain the difference between tissue and organ culture and their applicability.	K2
CO2		
	Understand haploid culture and in vitro selection of mutants.	K3
CO3		

CO4	Analyze somaclonal variation for improved crop varieties in vitro cultures.	K4
CO5	Identify suitable cryopreservation and reculture technique for the cultured tissue.	K2
	Course Outcomes	
	Course: Bioinformatics II (KBT 603)	**BL**
	Unit	
CO1	Understand the various tools and techniques related to insilico modeling of biomolecules along with methods of drug designing, protein docking	K3
CO2	Analyze problems related to collection and analysis of biological data	K4
CO3	Develop steady and time dependent solutions along with their limitations	K3
CO4	Understand management and methods of large biological data and documents	K3
CO5	Understand concept of force field and their application in molecular modeling.	K3

	Course Outcomes	
	Course: Animal Biotechnology (KBT 061)	**BL**
	Unit	
CO1	Understand basics of animal tissue culture and its importance	K1, K3
CO2	Understand techniques to establish animal cell cultures invitro as well as different types of reactorsand their working	K1, K3
CO3	Understand techniques to establish animal cell cultures invitro as well as different types of reactors and their working.	K1, K3
CO4	Understand the methods of transgene delivery and production of transgenic animals	K1, K3
CO5	Understand the process of stem cell differentiation and their applications with case studies	K1, K3
	Course Outcomes	**BL**
	IDEA TO BUSINESS MODEL (KOE060)	
S.No.	Course Outcome/ Unit	
CO1	This course can motivate students to have an overall idea how to start and sustain a business enterprise.	K1
CO2	The students will learn basics of choosing an idea of a business model.	K1
CO3	The core areas of choosing a business model are encompassed with Entrepreneurship development, PPC & communication system. The students will thus develop basic competencies how to run a business enterprise.	K1 & K2
	Course Outcomes	**BL**
	Constitution of India, Lawand Engineering (KNC601)	
S.No.	Course Outcome/ Unit	
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society	**K2**
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.	**K2**
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	**K2**
CO4	Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.	**K2**
CO5	Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.	**K2**
	Course Outcomes	
	Course: Bioprocess Engineering Lab-I (KBT 451)	**BL**
S. No.	**Unit**	
CO1	Understanding of basic physics of fluids.	K1, K3
CO2	Understanding of analyzing flow systems in terms of mass, momentum, and energy balance.	K3
CO3	To experience handling different unit operations.	K1, K3
CO4	To apply principles of basic sciences and chemical engineering for designing various size reduction, size separation and conveying equipments.	K3
CO5	Gaining knowledge to calculate and design engineering applications involving fluid.	K3
	Course Outcomes	

Course: Genetics and Molecular Biology Lab (KBT 452)		BL
	Unit	
CO1	Understand experimental methods for analysis of genes and genomes	K2
CO2	Conducts experiments for isolation of DNA from living organisms.	K3
CO3	Conducts experiments for analysis of DNA content by spectrophotometer	K3
CO4	Understand working of PCR amplification of DNA	K2
CO5	Conducts gel electrophoresis and DNA band visualization	K3

Course Outcomes		
Course: Enzyme Engineering lab (KBT 453)		**BL**
	Unit	
CO1	Conduct experiments related to production of commercially important enzymes from microbial sources.	K3
CO2	Conducts experiments for determination of enzyme activity and specific activity.	K3
CO3	Conducts experiments to identify and determine purity of enzymes.	K3
CO4	Conducts experiments to determine the effect of pH, temperature, inhibitors on enzyme activity.	K1, K3
CO5	Conducts experiments for immobilization of enzymes by various techniques.	K3
Course Outcomes		
Course: Bioprocess engineering II Lab (KBT 651)		**BL**
	Unit	
CO1	Determine the growth patterns and specific growth rate of *E.coli* .	K3
CO2	Determine the effects of temperature on *Psuedomonas putida.*	K3
CO3	Determine the effects of pH on *Psuedomonas putida.*	K3
CO4	Preparation of immobilized enzymes & cells and evaluation of kinetic parameters.	K3
CO5	To produce citric acid from whey with glucose as supplementary carbon source by *Aspergillus niger.*	K3

Course Outcomes		
Course: Plant biotechnology Lab (KBT 652)		**BL**
	Unit	
CO1	Understand the process of explant selection, preparation and surface sterilization.	K2, K3
CO2	To prepare artificial seed/synthetic seed for conservation of germplasm.	K3
CO3	Isolation and characterization of plant secondary metabolites from selected medicinal plants.	K3
CO4	To extract DNA from plants and its estimation.	K3
CO5	To induce callus from different explants.	K3

Course Outcomes		
Course: Bioinformatics Lab (KBT 653)		**BL**
	Unit	
CO1	Understand the basic software and tools used in structure prediction of biomolecules.	K2, K3
CO2	Conduct experimental procedure for Ramachandran plot and its analysis.	K3
CO3	To understand, design and construct primer for the given DNA sequence using Web based tool.	K2,
CO4	Construct phylogenetic tree using protein/nucleotide sequences.	K3
CO5	Enhance their practical knowledge and thus their employability	K4

DEPARTMENT OF MBA		
Course Outcomes		BL
Course - Management Concepts & Organizational Behaviour **KMBN101**		
	Course Outcome/ Unit	
CO1	Developing understanding of managerial practices and their perspectives.	K1
CO2	Understanding and applying the concepts of organizational behavior	K2
CO3	Applying the concepts of management and analyze organizational behaviors in real worldsituations.	K3
CO4	Comprehend and practice contemporary issues inmanagement.	K4
CO5	Applying managerial and leadership skills amongstudents.	K3

Course Outcomes		BL
Course – Managerial Economics**KMBN102**		
	Course Outcome/ Unit	
CO1	Students will be able to remember the conceptsof micro economics and also able to understand the various micro economic principles to make effective economic decisions under conditions of risk and uncertainty.	K1
CO2	The students would be able to understand the lawof demand & supply & their elasticities, evaluate & analyze these concepts and apply them in various changing situations in industry. Students would beable to apply various techniques to forecast demand for better utilization of resources.	K2
CO3	The students would be able to understand the production concept and how the production output changes with the change in inputs and able to analyze the effect of cost to business and their relation to analyze the volatility in the business world.	K3
CO4	The students would be able to understand & evaluate the different market structure and their different equilibriums for industry as well as for consumers for the survival in the industry by the application of various pricing strategies.	K4
CO5	The students would be able to analyze the macroeconomic concepts & their relation to micro economic concept & how they affect the business & economy.	K3

Course Outcomes		BL
Course - Financial Accounting &Analysis **KMBN103**		
	Course Outcome/ Unit	
CO1	Understand and apply accounting concepts, principles and conventions for their routine monetary transaction.	K1
CO2	Understand about IFRS, Ind AS and IAS for preparation and reporting of financial statements.	K2
CO3	Create and prepare financial statements and Cashflow in accordance with Generally accepted Accounting Principles	K3
CO4	Analyze, interpret and communicate the information contained in basic financial statements and explain the limitations of such statements. .	K4
CO5	Recognizing various types of accounting and utilize the technology and social responsibility in facilitating and enhancing accounting and financial reporting processes	K3
Course Outcomes		BL
Course - Business Statistics& Analytics **KMBN104**		
	Course Outcome/ Unit	
CO1	Gaining Knowledge of basic concept/ fundamentals of business statistics.	K1
CO2	To compute various measures of central tendency,Measures of Dispersion, Time Series Analysis, Index Number, Correlation and Regression analysis and their implication on Business performance.	K2
CO3	Evaluating basic concepts of probability and perform probability theoretical distributions	K3
CO4	To apply Hypothesis Testing concepts and able toapply inferential statistics- t, F, Z Test and Chi Square Test.	K4
CO5	To perform practical application by taking managerial decision and evaluating the Concept ofBusiness Analytics.	K3

Course Outcomes		BL
Course - Marketing Management**KMBN105**		
	Course Outcome/ Unit	
CO1	Remember and comprehend basic marketing concepts.	K1
CO2	Understand marketing Insights on application of basic marketing concepts.	K2
CO3	Able to Apply and develop Marketing Strategies and Plans	K3
CO4	Understand and Analyzing Business/ ConsumerMarkets and ability Identify & evaluate Market Segments and Targeting.	K4
CO5	Develop skills to understand the current globaland digital aspect of marketing.	K3

Course Outcomes		
Course - Design Thinking		
	Course Outcome/ Unit	
1	Gain in depth knowledge about creative thinkingand design thinking in every stage of problem	K1
2	Applying design thinking to your real life problems / situations in order to evolve an innovative and workable solutions	K2
3	Understand and implement design thinking to your real life problems / situations in order to evolve aninnovative and workable solutions	K3
Course Outcomes		
Course - Business Communication**KMBN107**		
	Course Outcome/ Unit	

CO1	Apply business communication strategies and principles to prepare effective communication fordomestic and international business situations.	K1
CO2	Analyze ethical, legal, cultural, and global issues affecting business Communication.	K2
CO3	Develop an understanding of appropriate organizational formats and channels used in business communications	K3
CO4	Gaining an understanding of emerging electronicmodes of communication.	K4
CO5	Developing effective verbal and non verbalcommunication skills.	K5

Course Outcomes		BL
Course - IT Skills Lab -1		
	Course Outcome/ Unit	
CO1	Gain in depth knowledge about the functioning ofcomputers and its uses for managers	K1
CO2	Learn to use Internet and its applications	K2
CO3	Understand and implement Word processing software	K3
CO4	Learn applications on Spread sheet software	K4
CO5	Analyze and learn Presentation software	K5

Course Outcomes		BL
Course - Mini Project -1		
	Course Outcome/ Unit	
1	Gain in depth knowledge on innovative idea forproduct or services in form of a project report.	2
2	To apply innovative idea, its feasibilities anddetail descriptions.	4

M.B.A.- 2nd Semester

Course Outcomes		BL
Course - Business Environment &Legal Aspect ofBusiness		
	Course Outcome/ Unit	
CO1	Develop understanding and fundamentalknowledge about business environment.	K1
CO2	Develop understanding on the concepts of Business Environment and international businessenvironment.	K2
CO3	Develop basic understanding of law of	K3
CO4	Understanding of provisions of Companies Actconcerning incorporation and regulation of business organizations	K4
CO5	Able to analyze case laws in arriving at conclusions facilitating business decisions.	K5

Course Outcomes		BL
Course - Human ResourceManagement **KMBN202**		
	Course Outcome/ Unit	
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.	K1
CO2	Demonstrate knowledge of laws that impact behaviour in relationships between employers andemployees that ultimately impact the goals and Strategies of the organization.	K2
CO3	Understand the role of employee benefits and compensation as a critical component of employee performance, productivity and organizational effectiveness.	K3
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.	K4
CO5	Demonstrate knowledge of practical application of training and employee development as it impactsorganizational strategy and competitive advantage.	K5
Course Outcomes		BL
Course – Business Research Methods **KMBN203**		
	Course Outcome/ Unit	
CO1	Knowledge of concept / fundamentals for differenttypes of research.	K1
CO2	Applying relevant research techniques.	K2
CO3	Understanding relevant scaling & measurement techniques and should use appropriate sampling techniques	K3
CO4	Synthesizing different techniques of coding,editing, tabulation and analysis in doing research.	K4
CO5	Evaluating statistical analysis which includes ANOVA technique and prepare research report.	K5

Course Outcomes		BL
Course - Financial Management & Corporate Finance		
	Course Outcome/ Unit	
CO1	Understand the different basic concept / Models of Corporate Finance and Governance	K1
CO2	Understand the practical application of time value of money and evaluating long term investment decisions	K2
CO3	Develop analytical skills to select the best source of capital, structure and leverage.	K3
CO4	Understand the use and application of different models for firm's optimum dividend pay-out.	K4
CO5	Understand the recent trends of mergers and acquisition and its valuation	K5

Course Outcomes		BL
Course- Operations Management**KMBN205**		
	Course Outcome/ Unit	
CO1	Understand the role of Operations in overall Business Strategy of the firm - the application of OM policies and techniques to the service sector as well as manufacturing firms.	K1
CO2	Understand and apply the concepts of MaterialManagement, Supply Chain Management and TQM perspectives.	K2
CO3	Identify and evaluate the key factors and theirinterdependence of these factors in the design of effective operating systems.	K3
CO4	Analyze / understand the trends and challenges of Operations Management in the current business environment.	K4
CO5	Apply techniques for effective utilization of operational resources and managing the processes toproduce good quality products and services at competitive prices.	K5

Course Outcomes		BL
Course – Quantitative Techniques ForManagers		
	Course Outcome/ Unit	
CO1	Be able to understand the characteristics of different types of decision- making environments and theappropriate decision making approaches and tools to be used in each type.	K1
CO2	To formulate linear programming problem and to find optimal solution by graphical simplex method.	K2
CO3	Be able to build and solve Transportation Modelsand Assignment Models also to solve game theory problems by understanding pure and mix strategies.	K3
CO4	To assign optimal sequence of difference jobs ondifferent machines and develop understanding of queuing theory concepts.	K4
CO5	To implement replacement of equipment at right time and able to implement project managementconcepts like CPM, PERT to reduce cost and time.	K5
Course Outcomes		BL
Course - Digital Marketing& E Commerce **KMBN207**		
	Course Outcome/ Unit	
CO1	Be able to understand the concept of Digital Marketing & E- commerce in today's scenario.	K1
CO2	To able to create and maintain a good website and blog posts.	K2
CO3	Be able to understand and apply SEO and Email Marketing in today's modern world.	K3
CO4	To apply the Social Media Marketing techniques via various platforms.	K4
CO5	To implement various Analytics tools of online marketing	K5

Course Outcomes		BL
Course - ManagementInformation Systems **KMBN208**		
	Course Outcome/ Unit	
CO1	Be able to understand the importance of information management in business and management.	K1
CO2	To understand and formulate different types of information systems in business.	K2
CO3	Be able to apply the theory and concepts in practical with help of software.	K3
CO4	To apply various security and ethical issues with Information Systems.	K4
CO5	To synthesize applications on Spread sheet and database software.	K5
Course Outcomes		BL
Course – IT Skills Lab-2		
	Course Outcome/ Unit	
1	To gain knowledge of pivot table and understand the validating & auditing techniques.	K1
2	Learn to use different charting techniques in MS Excel .	K2
3	Learn to use different formatting techniques in MS Excel.	K3
Course Outcomes		BL
Course – Mini Project -2		
	Course Outcome/ Unit	
1	To gain knowledge of issues challenge of the industry.	K1
2	Learn to prepare report on the application of emerging technologies in the selected industry.	K2

M.B.A.- 3rd Semester

Course Outcomes		BL
Course - Strategic Management**KMBN301**		
	Course Outcome/ Unit	
CO1	Formulate organizational vision, mission, goals, andvalues.	K1
CO2	Develop strategies and action plans to achieve anorganization's vision, mission, and goals.	K2
CO3	Develop powers of managerial judgment, how toassess business risk, and improve ability to make sound decisions and achieve effective outcomes	K3
CO4	Evaluate and revise programs and procedures inorder to achieve organizational goals.	K4

CO5	Consider the ethical dimensions of the strategicmanagement process.	K3
Course Outcomes		BL
Course – Innovation And Entrepreneurship**KMBN302**		
	Course Outcome/ Unit	
CO1	Remember and comprehend basic concepts ofentrepreneurship.	K1
CO2	Develop knowledge on Entrepreneurial Finance, Assistance and role of Entrepreneurial Development Agencies	K2
CO3	Develop understanding of converting an Idea to an opportunity and develop understanding of various funding sources.	K3
CO4	Gain in depth knowledge of innovation and itsvarious sources.	K4
CO5	Develop understanding of various dimensions of innovation along with current trends and general awareness of innovation and startup.	K3

Course Outcomes		BL
Course - Universal Human Values And Professional Ethics**KVE 301**		
	Course Outcome/ Unit	
CO1	Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society.	K1
CO2	Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co- existence of Self and Body	K2
CO3	Understand the value of harmonious relationship based on trust, respect and other naturally acceptable feelings in human-human relationships and explore their role in ensuring a harmonious society	K3
CO4	Understand the harmony in nature and existence and work out their mutually fulfilling participation in thenature.	K4
CO5	Distinguish between ethical and unethical practices,and start working out the strategy to actualize a harmonious environment wherever they work.	K5
Course Outcomes		BL
Course - Talent Management **KMBN HR01**		
	Course Outcome/ Unit	
CO1	Knowledge of Talent Management Processes.	K1
CO2	Understanding for analysis of the impacts of Talent management in the organization.	K2
CO3	Competency to implement Talent Management practices.	K3
CO4	Competency to develop leadership qualities among subordinate.	K4
CO5	Knowledge about the reward system to support Talent management.	K5

Course Outcomes		BL
Course - Employee Relations And Labor Laws **KMBN HR02**		
	Course Outcome/ Unit	
CO1	Knowledge of Industrial Relation framework.	K1
CO2	Competency to understand the importance of Employee Relation within the perspective of IndustrialRelation.	K2
CO3	Knowledge about relevant Laws of HR management.	K3
CO4	Competency to interpreted and implement the Labor Laws within organization.	K4
CO5	Competency to use Collective Bargaining and Grievance redressal Mechanism.	K5

Course Outcomes		
Course - Consumer Behaviour and Marketing Communication**KMBN MK01**		
	Course Outcome/ Unit	
		BL
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.	K2
CO2	Develop the cognitive skills to enable theapplication of the above knowledge to marketing decisionmaking and activities .	K3
CO3	Be able to demonstrate how concepts may be applied to marketing strategy.	K2
CO4	Apply an IMC approach in the development of an overall advertising and promotional plan.	K3
CO5	Enhance creativity, critical thinking and analyticalability through developing an integrated marketing communication campaign.	K1

Course Outcomes		
Course - Marketing Analytics **KMBN MK02**		
	Course Outcome/ Unit	
CO1	Students will develop the skill in marketing analytics.	K2
CO2	Students will be acquainted with better understanding of real life marketing data and its analysis.	K3
CO3	Students will develop analytical skill for effective market decision.	K2
CO4	Define and apply knowledge of various aspects of managerial decision making related to pricing strategy and tactics.	K3
CO5	Be able to demonstrate how concepts may be applied to marketing strategy.	K1

Course Outcomes		BL

Course - Investment Analysis And Portfolio Management **KMBN FM01**		
	Course Outcome/ Unit	
CO1	Understand about various investment avenues.	K2
CO2	Understand the value of assets and manage investment portfolio.	K3
CO3	Understand various Models of Investment and its application.	K2
CO4	Understand and create various investment strategies on the basis of various market conditions.	K3
CO5	Measure riskiness of a stock or a portfolio position.	K1

Course Outcomes		BL
Course - Financial Planningand Tax Management		
	Course Outcome/ Unit	
CO1	Understand about various tax provision and planning.	K2
CO2	Understand the scope tax planning concerning various business and managerial and strategic activitiescan be explored.	K3
CO3	Have Know about various Tax Dates Rates and Forms.	K2
CO4	Have Knowledge of Financial Planning and its Process.	K3
CO5	Have knowledge about asset allocation and retirement planning process.	K1

Course Outcomes		
Course - International Business Management **KMBN IB01**		
	Course Outcome/ Unit	
CO1	To get an overview of the key issues and concepts of International Business.	K2
CO2	Understand how and why the world's countries differ.	K3
CO3	Understand the monetary framework in whichinternational business transactions are conducted .	K2
CO4	Understand the role of International Organizationsand Regional Trade blocks.	K3
CO5	Implement the decisions for international operationsin a superior manner.	K1

Course Outcomes		
Course - Export ImportDocumentation**KMBN IB02**		
	Course Outcome/ Unit	
CO1	Identify the process of Registration process, Payment terms, Export costing and pricing.	K1
CO2	Interpret the process of Shipment procedures, & summarize the various documents used in Shipping.	K2
CO3	Classify the concept of various incentives, benefits& risks involved in shipping process.	K3
CO4	Discuss the various business planning Import procedures &various export promotion schemes.	K2
CO5	Demonstrate the various export promotion schemes & types of export houses	KK3
Course Outcomes		BL
Course - Data Analytics ForBusiness Decisions**KMBN IT01**		
	Course Outcome/ Unit	
CO1	Understand the basics of business analysis and Data Science.	K2
CO2	Understand data management and handling and Data Science Project Life Cycle.	K3
CO3	Understand the data mining concept andits techniques.	K2
CO4	Understand and Analyzing machine learning concept.	K3
CO5	Understand the application of business analysis in different domain.	K1

Course Outcomes		BL
Course - AI and ML forBusiness **KMBN IT02**		
	Course Outcome/ Unit	
CO1	To understand the need of Machine Learning & Statistics for solving various problems.	K2
CO2	To understand the basic concepts of Supervised and Unsupervised learning.	K3
CO3	To apply regression analysis on the data available.	K2
CO4	To design appropriate machine learning and apply on real world problems.	K3
CO5	To optimize different Machine Learning & Deep Learning Techniques.	K1

M.B.A.- 4th Semester

Course Outcomes		BL
Course - Emerging Technologies inGlobal Business		
	Course Outcome/ Unit	
CO1	To get an overview of the changing context ofInternational Business in the wake of Industry 4.0	K2
CO2	Conceptual understanding of the newtechnologies that are driving change in business operations and strategy.	K3
CO3	Understand shifts in economic thought and itsimpact on business decisions.	K2
CO4	Understand changing geo politics and analysesits impact on international Business.	K3
CO5	Critically think about issues and challenges inthe Global World and find sustainable solutions	K1

Course Outcomes		BL
Course – HR Analytics		
	Course Outcome/ Unit	

CO1	Apply HR Analytical techniques in the areas of HRP, recruitment and selection, Compensation and Benefits and Training etc.	K2
CO2	Demonstrate HR function in adding value inbusiness terms.	K3
CO3	Utilize soft factors in a people managementcontext and convert them into measurable variables.	K2
CO4	Design a Metrics and Analysis index forrecruitment, performance and or a training and development context	K3
CO5	Predict the issues using the available HR dataand formulate the best strategies.	K1

Course Outcomes		BL
Course - Performance AndReward Management		
	Course Outcome/ Unit	
CO1	Knowledge of Performance Management andPerformance Appraisal	K2
CO2	Competency to understand the importance ofimportance of Performance Management	K3
CO3	Knowledge about the Compensation andReward Systems	K2
CO4	Competency to implement the effective rewardsystems in the organization	K3
CO5	Ability to explain the relevance of competency mapping and understanding its linkage with career development.	K1
Course Outcomes		BL
Course - International HRM		
	Course Outcome/ Unit	
CO1	Understanding the Contexts of InternationalHRM	K2
CO2	Knowledge about the HR Processes in International Context	K3
CO3	Able to evaluate the impacts of Globalization on HRM	K2
CO4	Desired level of expertise on organizational	K3
CO5	Understanding the International culture in SHRM	K1

Course Outcomes		BL
Course - B2B And ServicesMarketing **KMBN MK03**		
	Course Outcome/ Unit	
CO1	Understand and nature of B2B marketing	K1
CO2	Ability to create an integrated marketing communications plan which includes promotional strategies	K2
CO3	Define and apply knowledge of various aspectsof managerial decision making related to pricing strategy and tactics	K3
CO4	Be able to identify critical issues related to service design, such as identifying and managing customer service experience, expectations, perceptions and outcomes.	K2
CO5	Use critical analysis to perceive service shortcomings in reference to ingredients to createservice excellence	K1

Course Outcomes		BL
Course - Sales And RetailManagement **KMBN MK04**		
	Course Outcome/ Unit	
CO1	Students will develop knowledge, understandingand skills in Sales force management	K1
CO2	Acquainted with better understanding of implementation of sales management strategies	K2
CO3	Develop analytical skills for effective decisionalternatives in sales management problems	K3
CO4	Develop the knowledge, understanding andskills in retail management.	K2
CO5	Acquainted with better understanding of implementation of retail management strategies anddevelop analytical skills for effective decision alternatives in retail operations	K1

Course Outcomes		BL
Course - Social Media AndWeb Analytics **KMBN MK05**		
	Course Outcome/ Unit	
CO1	Students will develop knowledge, understanding and skills in analysis of Social Media.	K1
CO2	Acquainted with better understanding of implementation Web Analytics tool	K2
CO3	Develop analytical skills for effective decisionalternatives in social media problems operations	K3
CO4	Develop the knowledge, understanding and skills in Facebook and Google analytics.	K2
CO5	Acquainted with better understanding of implementation of web analytics strategies and develop analytical skills for effective decision alternatives in social media.	K1

Course Outcomes		BL
Course - Financial Derivatives **KMBN FM03**		
	Course Outcome/ Unit	
CO1	Understand about various derivatives instruments and derivative Market structure	K1
CO2	Understand the forward and future pricing mechanism and strategies for hedging using various futures products	K2
CO3	Understand the option pricing mechanism and using options strategies for mitigating risk	K3
CO4	Understand the Commodity derivative market	K2
CO5	Understand the Swaps derivatives and their mechanism	K1
Course Outcomes		

Course – Foreign ExchangeAnd Risk Management **KMBN FM04**		BL
	Course Outcome/ Unit	
CO1	Understand the BOP and evaluation various exchange rate system	K1
CO2	Understand the theories of exchange rate determination	K2
CO3	Understand the foreign exchange transactions	K3
CO4	Understand the exchange dealings	K2
CO5	Understanding the various foreign exchange risk and its management	K1

Course Outcomes		BL
Course - Financial AndCredit Risk Analytics **KMBN FM05**		
	Course Outcome/ Unit	
CO1	Understand about various types of financial credit.	K1
CO2	Understand the credit risk and its rating.	K2
CO3	Understanding of credit commitments and its application	K3
CO4	Understanding of risk management and corporate governance.	K2
CO5	Measure riskiness of a stock or a portfolio position	K1
Course Outcomes		BL
Course - International Logistics Management **KMBN IB03**		
	Course Outcome/ Unit	
CO1	Understanding the issues in International Logistics for SCM	K1
CO2	Knowledge of Processes in Export Sales Contracts.	K2
CO3	Application of various techniques for Integrated Supply Chain Processes	K3
CO4	Knowledge of International Transportation	K2
CO5	Understanding and application Costs factors with International Logistics	K1

Course Outcomes		BL
Course - Cross CulturalManagement **KMBN IB04**		
	Course Outcome/ Unit	
CO1	Understand and apply different meanings and dimensions of "culture"	K1
CO2	Describe and analyze the impact of culture on business practices	K2
CO3	Explain and evaluate the impact of national culture on organizational cultures	K3
CO4	Understand the impact of culture on Human Resource Management	K2
CO5	Explain how leadership differs across cultures	K1

Course Outcomes		BL
Course - International TradeLaws		
	Course Outcome/ Unit	
CO1	Understand the objectives and functioning of WTO	K1
CO2	Review and apply the various WTO agreements for effective international trade	K2
CO3	Analyze the forces that shape the international commercial laws.	K3
CO4	Understand and evaluate the export import policy in India.	K2
CO5	Analyze the recent challenges in international trade and role of international institutions	K1

Course Outcomes		BL
Course - Data Base Management System **KMBN IT03**		
	Course Outcome/ Unit	
CO1	Knowledge about the DBMS Technology	K1
CO2	Understanding the business application ofDBMS	K2
CO3	Application of DBMS for business process	K3
CO4	Knowledge and uses of Data mining techniques	K2
CO5	Working knowledge of DBMS Software ORACLE	K1

Course Outcomes		BL
Course - Cloud ComputingFor Business **KMBN IT04**		
	Course Outcome/ Unit	
CO1	Describes the main concepts, key technologies,strengths and limitations of cloud computing.	K1
CO2	Learn the enabling technologies that help in thedevelopment of cloud.	K2
CO3	Develop the ability to understand and use the architecture cloud, service and delivery models	K3
CO4	Explain the core issues of cloud computing like cloud virtualization	K2
CO5	To appreciate the emergence of cloud as the nextgeneration computing paradigm	K1

Course Outcomes		BL
Course - Business Data Warehousing &Data Mining		
	Course Outcome/ Unit	
CO1	Understanding of data warehousing and its functions	K1
CO2	To identify the key processes of data warehousing and applications.	K2
CO3	To understand data mining basic concepts	K3
CO4	To understand data mining techniques to solve problems in various disciplines	K2
CO5	Compare and evaluate data mining techniques	K1

Course Outcomes		BL
Course -**Engineering Mechanics (KCE 301)**		
	Course Outcome/ Unit	
CO1	Use scalar and vector analytical techniques for analyzingforces in statically determinate structures.	K1
CO2	Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems.	K2
CO3	Apply basic knowledge of mathematics and physics to solve real-world problems.	K3
CO4	Understand basic dynamics concepts – force, momentum, work and energy .	K2
CO5	Understand and be able to apply Newton's law of motion	K1
Course Outcomes		BL
Course - **Surveying & Geomatics (KCE 302)**		
	Course Outcome/ Unit	
CO1	Describe the function of surveying and work with survey instruments, take observations, and prepare plan, profile, and cross-section and perform calculations.	K1
CO2	Calculate, design and layout horizontal and vertical curves.	K2
CO3	Operate a total station and GPS to measure distance, angles, and to calculate differences in elevation. Reduce data for application in a geographicinformation system.	K3
CO4	Relate and apply principles of photogrammetry for surveying.	K2
CO5	Apply principles of Remote Sensingand Digital Image Processingfor Civil Engineering problems.	K1

Course Outcomes		BL
Course - **Fluid Mechanics(KCE 303)**		
	Course Outcome/ Unit	
CO1	Understand the broad principles of fluid statics, kinematics and dynamics	K1
CO2	Understand definitions of basic terms used in fluid mechanics	K2
CO3	Understand classifications of fluid flow.	K3
CO4	Apply the continuity, momentum and energy principles	K2
CO5	Apply dimensional analysis	K1
Course Outcomes		BL
Course - **Building Planning & Drawing Lab(KCE 351)**		
	Course Outcome/ Unit	
CO1	Apply the principles of planning and bye-laws (National buildingcode) used for building planning	K1
CO2	Draft the plan, elevation and sectional views of the buildings using AutoCAD	K2

Course Outcomes		BL
Course -**Surveying & Geomatics Lab(KCE 352)**		
	Course Outcome/ Unit	
CO1	Demonstrate and handle various conventional surveying instruments such as chain/tape, compass, theodolite, auto-level in the field of civilengineering applications such as highyway profiling,setting out curves etc.	K1
CO2	Measure distances, horizontal & vertical angles and coordinates usingelectronic total station.	K2
CO3	Apply the principles of photogrammetric surveyingand take observations using mirror stereoscope and parallax bar.	K3
CO4	Measure coordinates using GPS and understand digitization using GIS and visual interpretation of standard FCC.	K2
Course Outcomes		BL
Course - **Fluid Mechanics Lab(KCE 353)**		
	Course Outcome/ Unit	
CO1	Evaluate Bernaulli's Theorem& Momentum equation in pipe flow.	K1
CO2	Apply continuity equation and flow visualisation in pipe flow.	K2
CO3	Verify the concept of buoyancy and hence metacentre point.	K3
CO4	Illustrate the concept of wind tunnel	K1

Course Outcomes		BL
Course - **Mini Project(KCE 354)**		
S.	**Course Outcome/ Unit**	
CO1	Understand a system, component or process to meet desired progress of project.	K1
CO2	Prepare project report for a project in civil engineering domain	K2

Course Outcomes		BL
Course - Engineering Hydrology(KCE 055)		
	Course Outcome/ Unit	
CO1	Understand the basic concept of hydrological cycle and its various phases.	K1
CO2	Understand the concept of runoff and apply the knowledge to construct the hydrograph	K2
CO3	Apply the various methods to assess the flood	K3
CO4	Assess the quality of various forms of water and their aquifer properties	K3
CO5	Understand the well hydraulics and apply ground water modelling techniques.	K2
Course Outcomes		BL
Course –GEOTECHNICAL ENGINEERING(KCE 501)		
	Course Outcome/ Unit	

CO1	Classify the soil and determine its Index properties.	K1
CO2	Evaluate permeability and seepage properties of soil.	K2
CO3	Interpret the compaction and consolidation characteristics & effective stress concept of soil.	K3
CO4	Determine the vertical and shear stress under different loading conditions and explain the phenomenon of soil liquefaction	K3
CO5	Interpret the earth pressure and related slope failures.	K2

Course Outcomes		BL
Course - STRUCTURAL ANALYSIS(KCE 502)		
	Course Outcome/ Unit	
CO1	Explain type of structures and method for their analysis.	K1
CO2	Analyze different types of trusses for member forces	K2
CO3	Compute slope and deflection in determinate structures using different methods	K3
CO4	Apply the concept of influence lines and moving loads to compute bending moment and shear force at different sections.	K3
CO5	Analyze determinate arches for different loading conditions.	K2
Course Outcomes		BL
Course- QUANTITY ESTIMATION AND CONSTRUCTION		
	Course Outcome/ Unit	
CO1	Understand the importance of units of measurement and preliminary estimate for administrative approval of projects.	K1
CO2	Understand the contracts and tender documents in construction projects	K2
CO3	Analyze and assess the quantity of materials required for civil engineering works as per specifications	K3
CO4	Evaluate and estimate the cost of expenditure and prepare a detailed rate analysis report	K3
CO5	Analyze and choose cost effective approach for civil engineering projects.	K2

Course Outcomes		BL
Course – CONCRETE TECHNOLOGY(KCE 051)		
	Course Outcome/ Unit	
CO1	Understand the properties of constituent material of concrete.	K1
CO2	Apply admixtures to enhance the properties of concrete.	K2
CO3	Evaluate the strength and durability parameters of concrete.	K3
CO4	Design the concrete mix for various strengths using difference methods.	K3
CO5	Use advanced concrete types in construction industry.	K2
Course Outcomes		BL
Course -CAD LAB(KCE-551)		
	Course Outcome/ Unit	
CO1	Working on latest version of geotechnical engineering software (Open source/commercial software)	K1
CO2	Working on latest version of surveying software (Open source/commercial software)	K2

Course Outcomes		BL
Course - **Geotechnical Engineering Lab(KCE 552)**		
	Course Outcome/ Unit	
CO1	Determine index properties of soil sample.	K1
CO2	Classify the soils on the basis of Indian standard.	K2
CO3	Determine permeability and compaction characteristics of soil.	K3
CO4	Assess shear strength parameters of soil samples.	K4
Course Outcomes		BL
Course – **Quantity Estimation & Management Lab(KCE 553)**		
	Course Outcome/ Unit	
CO1	Compute the quantities of work and material for construction for Building/ Septic tank/Water supply pipe line/road/bridge.	K1
CO2	Compute the Bill of Quantities (BOQ) for given project.	K2
CO3	Apply software tools for estimation of quantities & preparation of BOQ.	K3
CO4	Compose tender document for anygiven project work	K4

Course Outcomes		BL
Course - RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING(KHU		
	Course Outcome/ Unit	
CO1	Students can understand the definitions, concepts and components of Rural Development	K1
CO2	Students will know the importance, structure, significance, resources of Indian rural economy.	K2
CO3	Students will have a clear idea about the area development programmes and its impact.	K3
CO4	Students will be able to acquire knowledge about rural entrepreneurship.	K3
CO5	Students will be able to understand about the using of different methods for human resource planning	K2
Course Outcomes		BL
Course - RENEWABLE ENERGY RESOURCES RENEWABLE ENERGY		
	Course Outcome/ Unit	
CO1	To Explain the basic principles of various renewable energy conversion processes and devices used therein	K1
CO2	To expose the student to solar thermal, solar photovoltaic	K2
CO3	To expose the student to Geothermal Energy, Magneto-hydrodynamics (MHD) and fuel cell	K3

CO4	To expose the student to wind, tidal and renewable energy resources, conversion technologies, processes, systems and devices, and equip the student to take up projects in those areas	K3
CO5	To expose the student to biomass renewable energy resources	K2

Course Outcomes		BL
Course - Railways, Airports and Waterways(KCE 076)		
	Course Outcome/ Unit	
CO1	Explain the importance of railwayinfrastructure.	K1
CO2	Identify the factors governingdesign of railwayinfrastructures	K2
CO3	Analyse and design the railway track system.	K3
CO4	Understand the concepts of airport engineeringand design components of airport.	K3
CO5	Associate with the concepts of water transport system	K2
Course Outcomes		BL
Course - Design of Structure – III(KCE 701)		
	Course Outcome/ Unit	
CO1	Understand properties of steel and types of loads acting on steel structures.	K1
CO2	Design welded and bolted type of connections for elementarysteel structures.	K2
CO3	**D**esign tension members for elementarysteel structures	K3
CO4	Design compressionmembers such as simple columns, braced and latticed columns and column bases.	K3
CO5	Design flexural members such as beams, purlins and girders	K2

Course Outcomes		BL
Course - Non-Destructive Testing Lab(KCE 751)		
	Course Outcome/ Unit	
CO1	Determine strength of the concrete usingnon-destructive testingmethods.	K1
CO2	Determine strength of the steel usingnon-destructive testingmethods.	K2
CO3	Apply specific codes, standards and specifications related to non-destructive methods for testing of concrete and structural steel	K3
Course Outcomes		BL
Course – PROJECT(KCE 754)		
	Course Outcome/ Unit	
CO1	Work effectively as an individual and member of the team to solve complex civil engineering problems	K1
CO2	Apply engineering knowledge to solve real life problems and involve in self- learning process	K2
CO3	Apply modern tools for analysis and design of complex engineeringproblems	K3
CO4	Develop ethical solutions of engineeringproblems takinginto account its impact on society, environment and sustainability	K3
CO5	Compose and present detailed project report of his/ her workand defend effectively	K2

Course Outcomes		BL
Course - QUALITY MANAGEMENT(KOE 085)		
	Course Outcome/ Unit	
CO1	To understand the concept of Quality	K1
CO2	To understand the Implication of Quality on Business	K2
CO3	To Implement Quality Implementation Programs	K3
CO4	To have exposure to challenges in Quality Improvement Programs	K3
CO5	Develop research skills that will allow them to keep abreast of changes in the field of Quality Management	K2
Course Outcomes		BL
Course - PROJECT MANAGEMENT & ENTREPRENEURSHIP(KHU 802)		
	Course Outcome/ Unit	
CO1	Understand project characteristics and various stages of a project.	K1
CO2	Understand the conceptual clarity about project organization and feasibility analyses – Market, Technical, Financial and Economic.	K2
CO3	Analyze the learning and understand techniques for Project planning, scheduling and Execution Control.	K3
CO4	Apply the risk management plan and analyse the role of stakeholders.	K3
CO5	Understand the contract management, Project Procurement, Service level Agreements and productivity.	K2

Course Outcomes		BL
Course – PROJECT(KCE 851)		
	Course Outcome/ Unit	
CO1	Work effectively as an individual and member of the team to solve complex civil engineeringproblems	K1
CO2	Apply engineering knowledge to solve real life problems and involve in self- learning process	K2
CO3	Apply modern tools for analysis and design of complex engineeringproblems	K3
CO4	Develop ethical solutions of engineeringproblems takinginto account its impact on society, environment and sustainability	K3
CO5	Compose and present detailed project report of his/ her workand defend effectively.	K2

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Course Outcome (CO)		
KCS 301	**DATA STRUCTURE**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory,	K_1, K_2
CO 2	Discuss the computational efficiency of the sorting and searching algorithms.	K_2
CO 3	Implementation of Trees and Graphs and perform various operations on these data structure.	K_3
CO 4	Understanding the concept of recursion, application of recursion and its implementation and	K_4
CO 5	Identify the alternative implementations of data structures with respect to its performance to	K_5, K_6

KCS 302	**COMPUTER ORGANIZATION AND ARCHITECTURE**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Study of the basic structure and operation of a digital computer system.	K_1, K_2
CO 2	Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floating-	K_2, K_4
CO 3	Implementation of control unit techniques and the concept of Pipelining	K_3
CO 4	Understanding the hierarchical memory system, cache memories and virtual memory	K_2
CO 5	Understanding the different ways of communicating with I/O devices and standard I/O interfaces	K_2, K_4

KCS 303	**DISCRETE STRUCTURES & THEORY OF LOGIC**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Write an argument using logical notation and determine if the argument is or is not valid.	K_3, K_4
CO 2	Understand the basic principles of sets and operations in sets.	K_1, K_2
CO 3	Demonstrate an understanding of relations and functions and be able to determine their properties.	K_3
CO 4	Demonstrate different traversal methods for trees and graphs.	K_1, K_4
CO 5	Model problems in Computer Science using graphs and trees.	K_2, K_6

KCS 401	**OPERATING SYSTEM**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Understand the structure and functions of OS	K_1, K_2
CO 2	Learn about Processes, Threads and Scheduling algorithms.	K_1, K_2
CO 3	Understand the principles of concurrency and Deadlocks	K_2
CO 4	Learn various memory management scheme	K_2
CO 5	Study I/O management and File systems.	K_2, K_4

KCS 402	**THEORY OF AUTOMATA AND FORMAL LANGUAGES**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Analyze and design finite automata, pushdown automata, Turing machines, formal languages,	K_1, K_2
CO 2	Analyze and design, Turing machines, formal languages, and grammars	K_1, K_2
CO 3	Demonstrate the understanding of key notions, such as algorithm, computability, decidability,	K_2
CO 4	Prove the basic results of the Theory of Computation.	K_2
CO 5	State and explain the relevance of the Church-Turing thesis.	K_2, K_4

KCS 403	**MICROPROCESSOR**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Apply a basic concept of digital fundamentals to Microprocessor based personal computer	K_1, K_2
CO 2	Analyze a detailed s/w & h/w structure of the Microprocessor.	K_1, K_2
CO 3	Illustrate how the different peripherals (8085/8086) are interfaced with Microprocessor.	K_2
CO 4	Analyze the properties of Microprocessors(8085/8086)	K_2
CO 5	Evaluate the data transfer information through serial & parallel ports.	K_2, K_4

KNC 402 PYTHON PROGRAMMING		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	To read and write simple Python programs.	K_1, K_2
CO 2	To develop Python programs with conditionals and loops.	K_2, K_4
CO 3	To define Python functions and to use Python data structures –- lists, tuples, dictionaries	K_3
CO 4	To do input/output with files in Python	K_2
CO 5	To do searching ,sorting and merging in Python	K_2, K_4

KNC 301 COMPUTER SYSTEM SECURITY		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats	K_1, K_2
CO 2	To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats	K_2
CO 3	To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain	K_3
CO 4	To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain	K_4
CO 5	To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.	K_5, K_6

Database Management System (KCS501)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to:		
CO 1	Apply knowledge of database for real life applications.	K_3
CO 2	Apply query processing techniques to automate the real time problems of databases.	K_3, K_4
CO 3	Identify and solve the redundancy problem in database tables using normalization.	K_2, K_3
CO 4	Understand the concepts of transactions, their processing so they will familiar with broad range of database management issues including data integrity, security and recovery.	K_2, K_4
CO 5	Design, develop and implement a small database project using database tools.	K_3, K_6

Web Designing (KCS-052)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to:		
CO 1	Understand principle of Web page design and about types of websites	K_3, K_4
CO 2	Visualize and Recognize the basic concept of HTML and application in web designing.	K_1, K_2
CO 3	Recognize and apply the elements of Creating Style Sheet (CSS).	K_2, K_4
CO 4	Understand the basic concept of Java Script and its application.	K_2, K_3
CO 5	Introduce basics concept of Web Hosting and apply the concept of SEO	K_2, K_3

Computer Graphics (KCS-053)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to:		
CO 1	Understand the graphics hardware used in field of computer graphics.	K_2
CO 2	Understand the concept of graphics primitives such as lines and circle based on different algorithms.	K_2, K_4
CO 3	Apply the 2D graphics transformations, composite transformation and Clipping concepts.	K_4
CO 4	Apply the concepts of and techniques used in 3D computer graphics, including viewing transformations.	K_2, K_3
CO 5	Perform the concept of projections, curve and hidden surfaces in real life.	K_2, K_3

Object Oriented System Design (KCS-054)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to:		
CO 1	Understand the application development and analyze the insights of object oriented	K_2, K_4
CO 2	Understand, analyze and apply the role of overall modeling concepts (i.e. System, structural)	K_2, K_3
CO 3	Understand, analyze and apply oops concepts (i.e. abstraction, inheritance)	K_2, K_3, K_4
CO 4	Understand the basic concepts of C++ to implement the object oriented concepts	K_2, K_3
CO 5	To understand the object oriented approach to implement real world problem.	K_2, K_3

Machine Learning Techniques (KCS 055)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able:		
CO 1	To understand the need for machine learning for various problem solving	K_1 , K_2
CO 2	To understand a wide variety of learning algorithms and how to evaluate models generated from data	K_1 , K_3
CO 3	To understand the latest trends in machine learning	K_2 , K_3
CO 4	To design appropriate machine learning algorithms and apply the algorithms to a real-world problems	K_4 , K_6
CO 5	To optimize the models learned and report on the expected accuracy that can be achieved by applying the models	K_4, K_5

Application of Soft Computing (KCS- 056)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to :		
CO 1	Recognize the feasibility of applying a soft computing methodology for a particular problem	K_2, K_4
CO 2	Understand the concepts and techniques of soft computing and foster their abilities in designing and implementing soft computing based solutions for real-world and engineering problems.	K2,K_4, K_6
CO 3	Apply neural networks to pattern classification and regression problems and compare	K_3, K_5
CO 4	Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems	K_3, K_4
CO 5	Apply genetic algorithms to combinatorial optimization problems	K3, K5

Human Computer Interface (KCS- 058)		
Course Outcome (CO)		
At the end of course , the student will be able to		**BL**
CO 1	Understand and analyze the common methods in the user-centered design process and the appropriateness of individual methods for a given problem.	K_2, K_4
CO 2	Apply , adapt and extend classic design standards, guidelines, and patterns.	K_3, K_5
CO 3	Employ selected design methods and evaluation methods at a basic level of competence.	K_4, K_5

CO 4	Build prototypes at varying levels of fidelity, from paper prototypes to functional, interactive prototypes.	K_4, K_5
CO 5	Demonstrate sufficient theory of human computer interaction, experimental methodology and inferential statistics to engage with the contemporary research literature in interface technology and design.	K_3, K_4

Database Management Systems Lab (KCS-551)		**BL**
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
At the end of course , the student will be able to:		
CO 1	Understand and apply oracle 11 g products for creating tables, views, indexes, sequences and other database objects.	K_2, K_4
CO 2	Design and implement a database schema for company data base, banking data base, library information system, payroll processing	K_3, K_5
CO 3	Write and execute simple and complex queries using DDL, DML, DCL and TCL	K_4, K_5
CO 4	Write and execute PL/SQL blocks, procedure functions, packages and triggers, cursors.	K_4, K_5
CO 5	Enforce entity integrity, referential integrity, key constraints, and domain constraints on database	K_3, K_4

COMPILER DESIGN LAB (KCS-552)		
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	**BL**
At the end of course , the student will be able to:		K_2, K_4
CO 1	Identify patterns, tokens & regular expressions for lexical analysis.	K_3, K_5
CO 2	Design Lexical analyzer for given language using C and LEX /YACC tools	K_4, K_5
CO 3	Design and analyze top down and bottom up parsers.	K_4, K_5
CO 4	Generate the intermediate code	K_3, K_4
CO 5	Generate machine code from the intermediate code forms	

Software Engineering (KCS-601)		
Course Outcome (CO)		**BL**
At the end of course, the student will be able to		
CO 1	Explain various software characteristics and analyze different software Development Models.	K_1, K_2
CO 2	Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or	K_1, K_2
CO 3	Compare and contrast various methods for software design	K_2, K_3
CO 4	Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional	K_3
CO 5	Manage software development process independently as well as in teams and make use of Various software management tools for	K_5

Image Processing (KCS-062)		
Course Outcome (CO)		**Bloom's Knowledge Level**
At the end of course , the student will be able:		
CO 1	Explain the basic concepts of two-dimensional signal acquisition, sampling,	K_1, K_2
CO 2	Apply image processing techniques for image enhancement in both the spatial and	K_2, K_3
CO 3	Apply and compare image restoration techniques in both spatial and frequency domain.	K_2, K_3
CO 4	Compare edge based and region based segmentation algorithms for ROI extraction.	K_3, K_4
CO 5	Explain compression techniques and descriptors for image processing.	K_2, K_3

Data Compression (KCS-064)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able to		
CO 1	Describe the evolution and fundamental concepts of Data Compression and Coding	K_1, K_2
CO 2	Apply and compare different static coding techniques (Huffman & Arithmetic coding) for text	K_2, K_3
CO 3	Apply and compare different dynamic coding techniques (Dictionary Technique) for text	K_2, K_3
CO 4	Evaluate the performance of predictive coding technique for Image Compression.	K_2, K_3
CO 5	Apply and compare different Quantization Techniques for Image Compression.	K_2,K_3

Web Technology Lab (KCS-652)		
Course Outcome (CO)		
At the end of course , the student will be able to		**BL**
CO 1	Explain web development Strategies and Protocols governing Web.	K_2, K_4
CO 2	Develop Java programs for window/web-based applications.	K_3, K_5
CO 3	Design web pages using HTML, XML, CSS and JavaScript.	K_4, K_5
CO 4	Creation of client-server environment using socket programming	K_4, K_5
CO 5	Building enterprise level applications and manipulate web databases using JDBC	K_3, K_4

Software Project Management (KOE-068)		
Course Outcome (CO)		**BL**
At the end of course , the student will be able :		
CO 1	Identify project planning objectives, along with various cost/effort estimation models.	K_3
CO 2	Organize & schedule project activities to compute critical path for risk analysis.	K_3
CO 3	Monitor and control project activities.	K_4, K_5
CO 4	Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.	K_6
CO 5	Configure changes and manage risks using project management tools.	K_2, K_4

KAI071	**Optimization in Machine Learning**	
Course Outcome (CO)		**BL**
At the end of course , the student will be able to understand		
CO 1	Understand the basics of the **convex optimization.**	K_2
CO 2	Understand the different **Gradient-based methods.**	K_2, K_3
CO 3	Can implement Newton's method and L-BFGS solvers for convex optimization problems,	K_3 , K_4
CO 4	Can identify the trade-offs inherent in using first-order vs. second-order solvers for	K_2 , K_3

CO 5	Demonstrate competence with probability theory/statistics needed to formulate and solve	K_2 , K_4

KCS072	**Natural Language Processing**	
	Course Outcome (CO)	**BL**
	At the end of course , the student will be able :	
CO 1	To learn the fundamentals of natural language processing	K_1 , K_2
CO 2	To understand the use of CFG and PCFG in NLP	K_1 , K_2
CO 3	To understand the role of semantics of sentences and pragmatic	K_2
CO 4	To Introduce Speech Production And Related Parameters Of Speech.	K_1 , K_2
CO 5	To Show The Computation And Use Of Techniques Such As Short Time Fourier Transform, Linear Predictive Coefficients And	K_3, K_4

	KCS074	**Cryptography & Network Security**
	Course Outcome (CO)	**BL**
	At the end of course , the student will be able to understand	
CO 1	Classify the symmetric encryption techniques and Illustrate various Public key cryptographic techniques.	K_2
CO 2	Understand security protocols for protecting data on networks and be able to digitally sign emails and files.	K_2, K_3
CO 3	Understand vulnerability assessments and the weakness of using passwords for authentication	K_3 , K_4
CO 4	Be able to perform simple vulnerability assessments and password audits	K_2 , K_3
CO 5	Summarize the intrusion detection and its solutions to overcome the attacks.	K_2 , K_4

KCS711	**Mobile Computing**	
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
	At the end of course, the student will be able to understand	**BL**
CO 1	Explain and discuss issues in mobile computing and illustrate overview of wireless telephony and channel allocation in cellular systems.	K1, K4
CO 2	Explore the concept of Wireless Networking and Wireless LAN.	K1
CO 3	Analyse and comprehend Data management issues like data replication for mobile computers, adaptive clustering for mobile wireless networks and Disconnected operations.	K4
CO 4	Identify Mobile computing Agents and state the issues pertaining to security and fault tolerance in mobile computing environment.	K1, K2
CO 5	Compare and contrast various routing protocols and will identify and interpret the performance of network systems using Adhoc networks.	K2

KCS713	**Cloud Computing**	
	Course Outcome (CO)	
	At the end of course , the student will be able to understand	**BL**
CO 1	Describe architecture and underlying principles of cloud computing.	K_3
CO 2	Explain need, types and tools of Virtualization for cloud.	K_3, K_4
CO 3	Describe Services Oriented Architecture and various types of cloud services.	K_2, K_3
CO 4	Explain Inter cloud resources management cloud storage services and their providers Assess security services and standards for	K_2, K_4
CO 5	Analyze advanced cloud technologies.	K_3, K_6

KHU701	**RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING**	
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
	At the end of course, the student will be able to understand	**BL**
CO 1	Students aware about Definition, Concepts, Nature Scope of Rural development.	K1, K4
CO 2	Rural Society Understand the Concept, Nature, Characteristic about the Rural Society	K1
CO 3	Rural Social Institution Students get knowledge about the various Caste, Family system, history of class, changing pattern etc.	K4
CO 4	Social Changes Students Understand the Concepts, factor of social changes and role and Importance of NGO's and people Participation.	K1, K2

KHU801	**RURAL DEVELOPMENT: ADMINISTRATION AND PLANNING**	
	Course Outcome (CO)	**BL**
	At the end of course, the student will be able to understand	
CO 1	Students aware about Definition, Concepts, Nature Scope of Rural development.	K2, K4
CO 2	Rural Society Understand the Concept, Nature, Characteristic about the Rural Society	K1
CO 3	Rural Social Institution Students get knowledge about the various Caste, Family system, history of class, changing pattern etc.	K2
CO 4	Social Changes Students Understand the Concepts, factor of social changes and role and Importance of NGO's and people Participation.	K1, K2

Software Project Management (KOE-068)		
	Course Outcome (CO)	**BL**
	At the end of course, the student will be able:	
CO 1	Identify project planning objectives, along with various cost/effort estimation models.	K2, K4
CO 2	Organize & schedule project activities to compute critical path for risk analysis.	K1
CO 3	Monitor and control project activities.	K2
CO 4	Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.	K1, K2
CO 5	Configure changes and manage risks using project management tools.	K2

Mini Project or Internship Assessment (KCS 354 , KCS 554 , KCS 752)	
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**
At the end of course , the student will be able to understand	

CO 1	Developing a technical artifact requiring new technical skills and effectively utilizing a new software tool to complete a task	K_4 , K_5
CO 2	Writing requirements documentation, Selecting appropriate technologies, identifying and creating appropriate test cases for systems.	K_5 , K_6
CO 3	Demonstrating understanding of professional customs & practices and working with professional standards.	K_4 , K_5
CO 4	Improving problem-solving, critical thinking skills and report writing.	K_4 , K_5
CO 5	Learning professional skills like exercising leadership, behaving professionally, behaving ethically, listening effectively, participating as a member of a team, developing appropriate workplace attitudes.	K_2, K_4

Project (KCS 753 , KCS 851)		
Course Outcome (CO)	**Bloom's Knowledge Level (KL)**	
At the end of course , the student will be able to understand		
CO 1	Analyze and understand the real life problem and apply their knowledge to get programming solution.	K_4 , K_5
CO 2	Engage in the creative design process through the integration and application of diverse technical knowledge and expertise to meet customer needs and address social issues.	K_4 , K_5
CO 3	Use the various tools and techniques, coding practices for developing real life solution to the problem.	K_5 , K_6
CO 4	Find out the errors in software solutions and establishing the process to design maintainable software applications	K_4 , K_5
CO 5	Write the report about what they are doing in project and learning the team working skills	K_5, K_6

MCA (MASTER OF COMPUTER APPLICATION)

KCA101: FUNDAMENTAL OF COMPUTERS & EMERGING TECHNOLOGIES

	At the end of course , the student will be able to understand	**BL**
CO 1	Demonstrate the knowledge of the basic structure, components, features and generations of computers.	K2,K3
CO 2	Describe the concept of computer languages, language translators and construct algorithms to solve problems using programming concepts.	K1,K2
CO 3	Compare and contrast features, functioning & types of operating system and computer networks.	K2,K3
CO 4	Demonstrate architecture, functioning & services of the Internet and basics of multimedia.	K2,K3
CO 5	Illustrate the emerging trends and technologies in the field of Information Technology.	K2,K3

KCA102 :PROBLEM SOLVING USING C

	At the end of course , the student will be able to understand	**BL**
CO 1	Describe the functional components and fundamental concepts of a digital computer system including number systems.	K2,K3
CO 2	Construct flowchart and write algorithms for solving basic problems.	K1,K2
CO 3	Write 'C' programs that incorporate use of variables, operators and expressions along with data types.	K2,K3
CO 4	Write simple programs using the basic elements like control statements, functions, arrays and strings.	K2,K3
CO 5	Write advanced programs using the concepts of pointers, structures, unions and enumerated data types.	K2,K3
CO 6	Apply pre-processor directives and basic file handling and graphics operations in advanced programming.	K1,K2

KCA103 : Principles of Management & Communication

	At the end of course , the student will be able to understand	**BL**
CO 1	Describe primary features, processes and principles of management.	K2,K3
CO 2	Explain functions of management in terms of planning, decision making and organizing.	K1,K2
CO 3	Illustrate key factors of leadership skill in directing and controlling business resources and processes.	K2,K3
CO 4	Exhibit adequate verbal and non-verbal communication skills	K2,K3
CO 5	Demonstrate effective discussion, presentation and writing skills.	K2,K3

KCA104 : Discrete Mathematics

	At the end of course , the student will be able to understand	**BL**
CO 1	Use mathematical and logical notation to define and formally reason about basic discrete structures such as Sets, Relations and Functions	K1,K2
CO 2	Apply mathematical arguments using logical connectives and quantifiers to check the validity of an argument through truth tables and propositional and predicate logic	K1,K3
CO 3	Identify and prove properties of Algebraic Structures like Groups, Rings and Fields	K2,K3
CO 4	Formulate and solve recurrences and recursive functions	K2,K4
CO 5	Apply the concept of combinatory to solve basic problems in discrete mathematics	K3,K4

KCA105 : COMPUTER ORGANIZATION & ARCHITECTURE

	At the end of course , the student will be able to understand	**BL**
CO 1	Describe functional units of digital system and explain how arithmetic and logical operations are performed by computers	K2,K3
CO 2	Describe the operations of control unit and write sequence of instructions for carrying out simple operation using various addressing modes.	K1,K2
CO 3	Design various types of memory and its organization.	K2,K3
CO 4	Describe the various modes in which IO devices communicate with CPU and memory.	K2,K3
CO 5	List the criteria for classification of parallel computer and describe various architectural schemes	K2,K3

KCA151: PROBLEM SOLVING USING C LAB

	At the end of course , the student will be able to understand	BL
CO 1	Write, compile, debug and execute programs in a C programming environment.	K1,K2
CO 2	Write programs that incorporate use of variables, operators and expressions along with data types.	K1,K3
CO 3	Write programs for solving problems involving use of decision control structures and loops.	K2,K3
CO 4	Write programs that involve the use of arrays, structures and user defined functions.	K2,K4
CO 5	Write programs using graphics and file handling operations	K3,K4

	KCA152: COMPUTER ORGANIZATION & ARCHITECTURE LAB	
	At the end of course , the student will be able to understand	BL
CO 1	Design and verify combinational circuits (adder, code converter, decoder, multiplexer) using basic gates.	K6
CO 2	Design I/O system and ALU.	K2
CO 3	Demonstrate combinational circuit using simulator..	K3
CO 4	Design and verify various flip-flops.	K2

	KCA153 : PROFESSIONAL COMMUNICATION LAB	
	At the end of course , the student will be able to understand	BL
CO 1	Develop the ability to work as a team member as an integral activity in the workplace.	K2,K3
CO 2	Increase confidence in their ability to read, comprehend, organize, and retain written information. Improve reading fluency.	K1,K2
CO 3	Write coherent speech outlines that demonstrate their ability to use organizational formats with a specific purpose; Deliver effective speeches that are consistent with and appropriate for the audience	K2,K3
CO 4	Develop proper listening skills; articulate and enunciate words and sentences clearly and efficiently.	K2,K3
CO 5	Show confidence and clarity in public speaking projects; be schooled in preparation and research skills for oral presentations.	K2,K3

	KCA201: THEORY OF AUTOMATA & FORMAL LANGUAGES	
	At the end of course , the student will be able to understand	BL
CO 1	Define various types of automata for different classes of formal languages and explain their working.	K2,K3
CO 2	State and prove key properties of formal languages and automata.	K1,K2
CO 3	Construct appropriate formal notations (such as grammars, acceptors, transducers and regular expressions) for given formal languag	K2,K3
CO 4	Convert among equivalent notations for formal languages.	K2,K3
CO 5	Explain the significance of the Universal Turing machine, Church Turing thesis and concept of Undesirability.	K2,K3

	KCA202 : OBJECT ORIENTED PROGRAMMING	
	At the end of course , the student will be able to understand	BL
CO 1	List the significance and key features of object oriented programming and modeling using UML	K2,K3
CO 2	Construct basic structural, behavioral and architectural models using object oriented software engineering approach.	K1,K2
CO 3	Integrate object oriented modeling techniques for analysis and design of a system.	K2,K3
CO 4	Use the basic features of data abstraction and encapsulation in C++ programs.	K2,K3
CO 5	Use the advanced features such as Inheritance, polymorphism and virtual function in C++ programs	K2,K3

	KCA203 : OPERATING SYSTEMS	
	At the end of course , the student will be able to understand	BL
CO 1	Explain main components, services, types and structure of Operating Systems.	K1
CO 2	Apply the various algorithms and techniques to handle the various concurrency control issues.	K2
CO 3	Compare and apply various CPU scheduling algorithms for process execution.	K3
CO 4	Identify occurrence of deadlock and describe ways to handle it.	K2
CO 5	Explain and apply various memory, I/O and disk management techniques.	K4

	KCA204 : DATABASE MANAGEMENT SYSTEMS	
	At the end of course , the student will be able to understand	BL
CO 1	Describe the features of a database system and its application and compare various types of data models.	K2
CO 2	Construct an ER Model for a given problem and transform it into a relation database schema.	K3
CO 3	Formulate solution to a query problem using SQL Commands, relational algebra, tuple calculus and domain calculus.	K5
CO 4	Explain the need of normalization and normalize a given relation to the desired normal form.	K2
CO 5	Explain different approaches of transaction processing and concurrency control.	K3

	KCA205: DATA STRUCTURES & ANALYSIS OF ALGORITHMS	
	At the end of course , the student will be able to understand	BL
CO 1	Explain the concept of data structure, abstract data types, algorithms, analysis of algorithms and basic data organization schemes	K2
CO 2	Describe the applications of stacks and queues and implement various operations on them using arrays and linked lists	K3
CO 3	Describe the properties of graphs and trees and implement various operations such as searching and traversal on them.	K4
CO 4	Compare incremental and divide-and-conquer approaches of designing algorithms for problems such as sorting and searching.	K3
CO 5	Apply and analyze various design approaches such as Divide-and-Conquer, greedy and dynamic for problem solving .	K4

	KCAA01: CYBER SECURITY	
	At the end of course , the student will be able to understand	**BL**
CO 1	Identify and analyze nature & inherent difficulties in the security of the Information System.	K1
CO 2	Analyze various threats and attacks, corresponding counter measures and various vulnerability assessment and security techniques in an organization.	K2
CO 3	Applications of cyber based policies and use of IPR and patent law for software-based design.	K3
CO 4	Define E-commerce types and threats to E-commerce.	K2
CO 5	Explain concepts and theories of networking and apply them to various situations, classifying networks, analyzing performance.	K4

	KCA251:OBJECT ORIENTED PROGRAMMING LAB	
	At the end of course , the student will be able to understand	**BL**
CO 1	Use the Concept of Data Abstraction and Encapsulation in C++ programs.	K3
CO 2	Design and Develop C++ program using the concept such as polymorphism, virtual function, exception handling and template.	K2
CO 3	Apply object oriented techniques to analyze, design and develop a complete solution for a given problem.	K3

	KCA252: DATABASE MANAGEMENT SYSTEMS LAB	
	At the end of course , the student will be able to understand	**BL**
CO 1	Use the Concept of Data Abstraction and Encapsulation in C++ programs.	K6
CO 2	Write SQL commands to query a database.	K3
CO 3	Write PL/SQL programs for implementing stored procedures, stored functions, cursors, trigger and packages.	K6

	KCA253:DATA STRUCTURES & ANALYSIS OF ALGORITHMS LAB	
	At the end of course , the student will be able to understand	**BL**
CO 1	Write and execute programs to implement various searching and sorting algorithms.	K3
CO 2	Write and execute programs to implement various operations on two-dimensional arrays.	K3
CO 3	Implement various operations of Stacks and Queues using both arrays and linked lists data structures.	K3
CO 4	Implement graph algorithm to solve the problem of minimum spanning tree	K2