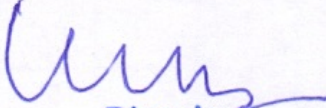


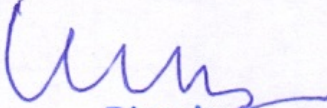
Course Outcomes are provided by the affiliating university (AKTU, Lucknow) along with the syllabus available on the website. Some specimen COs for various courses are mentioned below:

Course Outcomes: First Year (common to all branches)

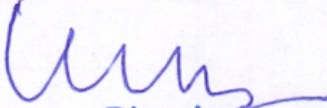
Engineering Physics (KAS-101T/ KAS-201T)
1. To solve the classical and wave mechanics problems.
2. To develop the understanding of laws of thermodynamics and their application in various processes.
3. To formulate and solve the engineering problems on Electromagnetism & Electromagnetic Field Theory.
4. To aware of limits of classical physics & to apply the ideas in solving the problems in their parent streams.
Engineering Chemistry (KAS-102T/ KAS-202T)
1. Use of different analytical instruments.
2. Measure molecular/ system properties such as surface tension, viscosity, conductance of solution, chloride and iron content in water.
3. Measure hardness of water.
4. Estimate the rate constant of reaction.
Engineering Mathematics-I (KAS-103T)
1. Remember the concept of matrices and apply for solving linear simultaneous equations.
2. Understand the concept of limit, continuity and differentiability and apply in the study of Rolle's, Lagrange's and Cauchy mean value theorem and Leibnitz theorems.
3. Identify the application of partial differentiation and apply for evaluating maxima, minima, series and Jacobians.
4. Illustrate the working methods of multiple integral and apply for finding area, volume, centre of mass and centre of gravity.
5. Remember the concept of vector and apply for directional derivatives, tangent and normal planes. Also evaluate line, surface and volume integrals.
Basic Electrical Engineering (KEE-101T/ KEE-201T)
1. Apply the concepts of KVL/KCL and network theorems in solving DC circuits.
2. Analyze the steady state behavior of single phase and three phase AC electrical circuits.
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.
4. Illustrate the working principles of induction motor, synchronous machine as well as DC machine and employ them in different area of applications.
5. Describe the components of low voltage electrical installations and perform elementary


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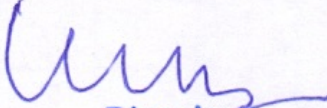
calculations for energy consumption.
Emerging Domain in Electronics Engineering (KEC-101T/ KEC-201T)
1. Understand the concept of PN Junction and devices
2. Understand the concept of BJT, FET and MOFET.
3. Understand the concept of Operational amplifier
4. Understand the concept of measurement instrument.
5. Understand the working principle of different type of sensor and their uses.
6. Understand the concept of IoT system & Understand the component of IoT system
Programming for Problem Solving (KCS-101T/ KCS 201T)
1. To develop simple algorithms for arithmetic and logical problems.
2. To translate the algorithms to programs & execution (in C language).
3. To implement conditional branching, iteration and recursion.
4. To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
5. To use arrays, pointers and structures to develop algorithms and programs.
Fundamentals of Mechanical Engineering & Mechatronics (KME-101T)
1. Understand the concept of stress and strain, factor of safety, beams
3. Understand the basic component and working of internal combustion engines, electric and hybrid vehicles, refrigerator and heat pump, airconditioning
3. Understand fluid properties, conservation laws, hydraulic machinery used in real life.
4. Understand the working principle of different measuring instrument with the knowledge of accuracy, error and calibration, limit, fit, tolerance and control system.
5. Understand concept of mechatronics with their advantages, scope and Industrial application, the different types of mechanical actuation system, the different types of hydraulic and pneumatic systems.
6. Apply concepts of strength of material for safe design, refrigeration for calculation of COP, concepts of fluid mechanics in real life, concepts of measurements in production systems
Engineering Physics Lab (KAS-151P/ KAS-251P)
1. To determine the wavelength of sodium light by Newton's ring experiment
2. To determine the wavelength of sodium light with the help of Fresnel's bi-prism
3. To determine the variation of magnetic field with the distance along the axis of a current carrying coil and estimate the radius of the coil.
4. To draw hysteresis (B-H curve) of a specimen in the form of a transformer and to determine its hysteresis loss.
Engineering Chemistry Lab (KAS-152P/ KAS-252P)
1. Use of different analytical instruments.
2. Measure molecular/system properties such as surface tension, viscosity.
3. Measure conductance of solution, chloride and iron content in water, hardness of water.
4. Estimate the rate constant of reaction.


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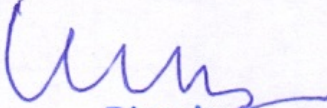
Basic Electrical Engineering Lab (KEE-151P/ KEE-251P)
1. Conduct experiments illustrating the application of KVL/KCL and network theorems to DC electrical circuits.
2. Demonstrate the behavior of AC circuits connected to single phase AC supply and measure power in single phase as well as three phase electrical circuits.
3. Perform experiment illustrating BH curve of magnetic materials.
4. Calculate efficiency of a single phase transformer and DC machine.
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.
Electronics Engineering Lab (KEC-151P/ KEC-251P)
1. Students will be able to identify various electronics components, cables, connectors and their symbols
2. Students will be able to perform measurement related tasks using multimeter and CRO etc.
3. Students will be able to practically demonstrate the characteristics of semiconductor devices and ICs like diodes, transistors and op-amp.
4. Students will be able to interpret the basics of communication systems.
5. Students will be able to perform measurements of displacement, force, temperature and pressure using various transducers.
Programming for Problem Solving (KCS-151P/ KCS-251P)
1. Able to implement the algorithms and draw flowcharts for solving Mathematical and Engineering problems
2. Demonstrate an understanding of computer programming language concepts.
3. Ability to design and develop Computer programs, analyzes, and interprets the concept of pointers, declarations, initialization, operations on pointers and their usage.
4. Able to define data types and use them in simple data processing applications also he/she must be able to use the concept of array of structures.
5. Develop confidence for self education and ability for life-long learning needed for Computer language.
English Language Lab (KCS-154P/ KCS-254P)
1. 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.
2. 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.
3. 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.
4. 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


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&presentation at their work place and also for academic uses.
5. 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.
Engineering Graphics & Design Lab (KCE-151P/ KCE-251P)
1. Understanding of the visual aspects of engineering design
2. Understanding of engineering graphics standards and solid modelling
3. Effective communication through graphics
4. Applying modern engineering tools necessary for engineering practice
5. Applying computer-aided geometric design
6. Analysis of Isometric views
7. Creating working drawings
Mechanical Workshop Lab (KWS-151P/ KWS-251P)
1. Use various engineering materials, tools, machines and measuring equipments.
2. Perform machine operations in lathe and CNC machine
3. Perform manufacturing operations on components in fitting and carpentry shop.
4. Perform operations in welding, moulding, casting and gas cutting.
5. Fabricate a job by 3D printing manufacturing technique
AI For Engineering (KMC-101/ KMC-201)
1. Understand the evolution and various approaches of AI
2. Understand data storage, processing, visualization, and its use in regression, clustering etc.
3. Understand natural language processing and chatbots
4. Understand the concepts of neural networks
5. Understand the concepts of face, object, speech recognition and robots
Emerging Technology for Engineering (KMC-102/ KMC-202)
1. To understand the basic concepts of IoT, followed by major components, its layer architecture and how IoT is impacting the Industry in the various forms along with major applications.
2. To make students aware about basic concepts of cloud computing, its benefits and different applications along with insights of major service providers.
3. To understand the basic concepts of Blockchain and its underlying technologies with its implementation as cryptocurrencies.
4. To understand the concept of Additive Manufacturing, its applications in various fields and the basic concepts of drones, their assembly and government regulations involved.
5. To introduce students to the upcoming technology and to develop the required skills for practical applications.
Soft Skills-I (KNC-101)
1. Students will be enabled to understand the correct usage of grammar.

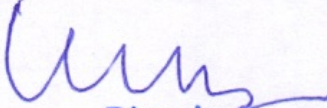

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2. Students will evaluate the importance of conversation in their personal and professional domain and apply it for extending their professional frontiers.
3. Students will learn to apply motivation skills for their individual and professional excellence.
4. Students will utilize their teamwork and their interpersonal communication skills to survive and excel at their work-place.
5. Students will learn to evaluate creativity for their professional innovation and critical thinking for their competence.
Engineering Mathematics-II (KAS-203T)
1. Understand the concept of differentiation and apply for solving differential equations.
2. Remember the concept of definite integral and apply for evaluating surface areas and volumes.
3. Understand the concept of convergence of sequence and series. Also evaluate Fourier series
4. Illustrate the working methods of complex functions and apply for finding analytic functions.
5. Apply the concept of complex functions for finding Taylor's series, Laurent's series and evaluation of definite integrals.


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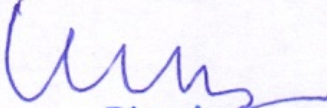
ECE

Electronic Devices (KEC-301)
1. Understand the principles of semiconductor Physics.
2. Understand and utilize the mathematical models of semiconductor junctions.
3. Understand carrier transport in semiconductors and design resistors.
4. Utilize the mathematical models of MOS transistors for circuits and systems.
5. Analyse and find application of special purpose diodes.
Digital System Design (KEC-302)
1. Design and analyze combinational logic circuits.
2. Design and analyze modular combinational circuits with MUX / DEMUX, Decoder & Encoder.
3. Design & analyze synchronous sequential logic circuits
4. Analyze various logic families.
5. Design ADC and DAC and implement in amplifier, integrator, etc.
Network Analysis and Synthesis (KEC303)
1. Understand basics electrical circuits with nodal and mesh analysis.
2. Appreciate electrical network theorems.
3. Apply Laplace transform for steady state and transient analysis.
4. Determine different network functions.
5. Appreciate the frequency domain techniques.
Electronic Devices Lab (KEC351)
1. Understand working of basic electronics lab equipment.
2. Understand working of PN junction diode and its applications.
3. Understand characteristics of Zener diode.
4. Design a voltage regulator using Zener diode.
5. Understand working of BJT, FET, MOSFET and apply the concept in designing of amplifiers.
Digital System Design Lab (KEC352)
1. Design and analyze combinational logic circuits.
2. Design & analyze modular combinational circuits with MUX/DEMUX, decoder, encoder.
3. Design & analyze synchronous sequential logic circuits.
4. Design & build mini project using digital ICs.
Network Analysis and Synthesis Lab (KEC353)
1. Understand basics of electrical circuits with nodal and mesh analysis.
2. Appreciate electrical network theorems.
3. Analyse RLC circuits.
4. Determine the stability of an electrical circuit.
5. Design network filters.
Communication Engineering (KEC401)
1. Analyze and compare different analog modulation schemes for their efficiency and bandwidth.

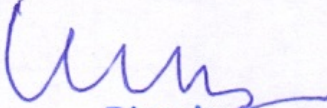

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2. Analyze the behavior of a communication system in presence of noise.
3. Investigate pulsed modulation system and analyze their system performance.
4. Investigate various multiplexing techniques.
5. Analyze different digital modulation schemes and compute the bit error performance.
Analog Circuits (KEC402)
1. Understand the characteristics of diodes and transistors.
2. Design and analyze various rectifier and amplifier circuits
3. Design sinusoidal and non-sinusoidal oscillators
4. Understand the functioning of OP-AMP and design OP-AMP based circuits.
5. Design LPF, HPF, BPF, BSF.
Signal System (KEC403)
1. Analyze different types of signals.
2. Analyze linear shift-invariant (LSI) systems.
3. Represent continuous and discrete systems in time and frequency domain using Fourier series and transform.
4. Analyze discrete time signals in z-domain.
5. Study sampling and reconstruction of a signal.
Communication Engineering Lab (KEC451)
1. Analyze and compare different analog modulation schemes for their modulation factor and power.
2. Study pulse amplitude modulation.
3. Analyze different digital modulation schemes and can compute the bit error performance.
4. Study and simulate the Phase shift keying.
5. Design a front end BPSK modulator and demodulator.
Analog Circuit Lab (KEC452)
1. Understand the characteristics of transistors.
2. Design and analyze various configurations of amplifier circuits.
3. Design sinusoidal and non-sinusoidal oscillators.
4. Understand the functioning of OP-AMP and design OP-AMP based circuits.
5. Design ADC and DAC.
Signal System Lab (KEC453)
1. Understand the basics operation of MATLAB.
2. Analysis the time domain and frequency domain signals.
3. Implement the concept of Fourier series and Fourier transforms.
4. Find the stability of system using pole-zero diagrams and bode diagram.
5. Design frequency response of the system.

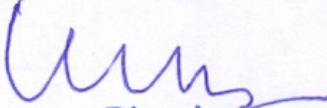
INTEGRATED CIRCUITS (KEC-501)
1. Explain complete internal analysis of Op-Amp 741-IC.
2. Examine and design Op-Amp based circuits and basic components of ICs such as various types of filter.


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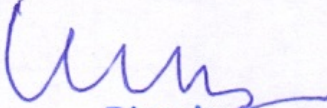
3. Implement the concept of Op-Amp to design Op-Amp based non-linear applications and wave-shaping circuits.
4. Analyse and design basic digital IC circuits using CMOS technology.
5. Describe the functioning of application specific ICs such as 555 timer, VCO IC 566 and PLL.
MICROPROCESSOR & MICROCONTROLLER (KEC-502)
1. Demonstrate the basic architecture of 8085.
2. Illustrate the programming model of microprocessors & write program using 8085 microprocessor.
3. Demonstrate the basics of 8086 Microprocessor and interface different external Peripheral Devices like timer, USART etc. with Microprocessor (8085/8086).
4. Compare Microprocessors & Microcontrollers, and comprehend the architecture of 8051 microcontroller
5. Illustrate the programming model of 8051 and implement them to design projects on real time problems
DIGITAL SIGNAL PROCESSING (KEC-503)
1. Design and describe different types of realizations of digital systems (IIR and FIR) and their utilities.
2. 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.
3. Design FIR filter using various types of window functions.
4. 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.
5. Define the concept of decimation and interpolation. Also, they will be able to implement it in various practical applications.
Computer Architecture and Organization (KEC-051)
1. Discuss about the basic concepts of system design methodology and processor level design.
2. Explain the basics of processor and basic formats of data representation.
3. Perform fixed and floating point arithmetic operations.
4. Describe the basic concepts of control design and pipeline performance.
5. Explain the architecture and functionality of central processing unit.
INDUSTRIAL ELECTRONICS (KEC-052)
1. Describe the characteristics, operation of power switching devices and identify their ratings and applications.
2. Recognize the requirement of SCR Protection and describe the Functioning of SCR.
3. Analyze and design Power Converter based on SCR for various Industrial Applications.
4. Explain High Frequency Heating Systems, Timers, Relevant Sensors & Actuator and their application in industrial setting.
5. Explain and apply Data Communication, Telemetry & SCADA System in industrial applications.


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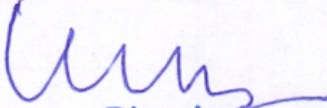
VLSI TECHNOLOGY (KEC-053)
1. Interpret the basics of crystal growth, wafer preparation and wafer cleaning.
2. Evaluate the process of Epitaxy and oxidation.
3. Differentiate the lithography, etching and deposition process.
4. Analyze the process of diffusion and ion implantation.
5. Express the basic process involved in metallization and packaging.
ADVANCED DIGITAL DESIGN USING VERILOG (KEC 054)
1. Describe mixed logic circuits and their implementation.
2. Implement combinational circuits using mixed logic and Verilog.
3. Design sequential circuits using mixed logic and Verilog with mapping of Algorithm
4. Understand faults and its elimination in sequential and combinational circuits.
5. Understand the working of programmable logic families.
ELECTRONIC SWITCHING (KEC-055)
1. Describe the fundamentals of circuit switching and distinguish complex telephone systems.
2. Differentiate the fundamentals of Space division switching and time division switching.
3. Design, develop and evaluate the telecom traffic to meet defined specifications and needs.
4. Identify the control of switching networks and signalling concepts
5. Classify the engineering concepts of packet switching and routing which will help to design various switch architectures for future research work.
ADVANCE SEMICONDUCTOR DEVICES (KEC-056)
1. Explain the behavior of BJT and MOSFET in DC biasing and as CE amplifier circuit.
2. Describe the Tunnel diode and IMPATT diode.
3. Explain the basics of Light-Emitting Diode (LED) and evaluate the performance of Photoconductor and photodiode.
4. Distinguish the performance of Photoconductor, photodiode, Phototransistor, Charge-Coupled Device.
5. Analyze the functioning of Metal-Semiconductor-Metal Photodetector.
ELECTRONIC MEASUREMENTS & INSTRUMENTATION (KEC-057)
1. Classify the Instrumentation and Measurement system and various measurement errors.
2. Analyze and design voltmeter circuits, AC electronic voltmeter, digital frequency meter and current measurement with electronic instruments
3. Evaluate various resistance and impedance measuring methods using Bridges and Q-meter
4. Analyze fundamental operation of CRO and some special type of oscilloscopes like DSO, Sampling oscilloscope
5. Demonstrate calibration method to calibrate various instruments and classify transducers like for force, pressure, motion, temperature measurement etc.
OPTICAL COMMUNICATION (KEC-058)
1. Define and explain the basic concepts and theory of optical communication.
2. Describe the signal losses with their computation and dispersion mechanism occurring inside the optical fiber cable.
3. Differentiate the optical sources used in optical communication with their comparative study problems related to optical communication systems.
4. Identify different optical components on receiver side; assemble them to solve real world


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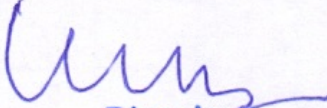
5. Evaluate the performance of an optical receiver to get idea about power budget and ultimately be an engineer with adequate knowledge in optical domain.
INTEGRATED CIRCUITS LAB (KEC-551)
1. Design different non-linear applications of operational amplifiers such as log, antilog amplifiers and voltage comparators.
2. Explain and design different linear applications of operational amplifiers such as filters.
3. Demonstrate the function of waveforms generator using op-Amp.
4. Construct multivibrator and oscillator circuits using IC555 and IC566 and perform measurements of frequency and time.
5. Design and practically demonstrate the applications based on IC555 and IC566.
MICROPROCESSOR & MICROCONTROLLER LAB (KEC-552)
1. 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.
2. Examine 8085 & 8086 microprocessor and its interfacing with peripheral devices.
3. State various conversion techniques using 8085 & 8086 and generate waveforms using 8085.
4. Implement programming concept of 8051 Microcontroller.
5. Design concepts to Interface peripheral devices with Microcontroller so as to design Microcontroller based projects.
DIGITAL SIGNAL PROCESSING LAB (KEC-553)
1. Create and visualize various discrete/digital signals using MATLAB/Scilab.
2. Implement and test the basic operations of Signal processing.
3. Examine and analyse the spectral parameters of window functions.
4. Design IIR and FIR filters for band pass, band stop, low pass and high pass filters.
5. Design the signal processing algorithms using MATLAB/Scilab.
DIGITAL COMMUNICATION (KEC-601)
1. To formulate basic statistics involved in communication theory.
2. To demonstrate the concepts involved in digital communication.
3. To explain the concepts of digital modulation schemes.
4. To analyze the performance of digital communication systems.
5. To apply the concept of information theory in digital systems.
Control System (KEC-602)
1. 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.
2. Explain the concept of state variables for the representation of LTI system.
3. Interpret the time domain response analysis for various types of inputs along with the time domain specifications.
4. Distinguish the concepts of absolute and relative stability for continuous data systems along with different methods.
5. Interpret the concept of frequency domain response analysis and their specifications.


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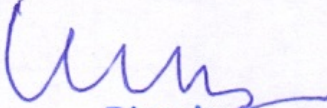
Antenna & Wave Propagation (KEC-603)
1. Identify different coordinate systems and their applications in electromagnetic field theory to establish a relation between any two systems using the vector calculus.
2. Explain the concept of static electric field, current and properties of conductors.
3. Express the basic concepts of ground, space, sky wave propagation mechanism.
4. Demonstrate the knowledge of antenna fundamentals and radiation mechanism of the antenna.
5. Analyze and design different types of basic antennas.
MICROCONTROLLER & EMBEDDED SYSTEMS DESIGN (KEC-061)
1. Explain the advance concept of 8051 architectures and AVR family architecture and compare them for different applications.
2. To demonstrate the basics of MSP430x5x Microcontroller
3. To execute the I/O interfacing and peripheral devices associated with Microcontroller SoC (system on chip).
4. Explain the advance concept Arm Cortex-M4 Processor Architecture.
5. Demonstrate the ability to do Demonstrate the basics of Embedded Systems, IoT and its application and design IoT based projects on Arm based development boards.
SATELLITE COMMUNICATION (KEC-062)
1. Define and list the benefits of satellite communication.
2. Demonstrate orbital mechanics principles of satellite communication systems and solve problems related to it.
3. Describe a satellite link and identify ways to improve the link performance.
4. Classify new technologies of satellite communication systems as per given specifications.
5. Examine advanced technologies of satellite launching and describe the Indian satellite system.
DATA COMMUNICATION NETWORKS (KEC-063)
1. Identify the issues and challenges in the architecture of a network.
2. Analyze the services and features of various protocol layers in data layer.
3. Demonstrate the knowledge of multiple access to design a access technique for a particular application.
4. Realize protocols at different layers of a network hierarchy.
5. Recognize security issues in a network and various application of application layer.
ANALOG SIGNAL PROCESSING (KEC-064)
1. Describe and apply fundamentals of signal processing in analog domain and its associated concepts like OTA and current conveyor.
2. Introduction of filter and its designing parameters
3. Solve problems and design higher order filters like Butterworth and Chebyshev.
4. Understand and explain the reasons for delay in filter designing and its procedure to equalize.
5. Understand the principles of the inductor simulation like general impedance convertor (GIC), optimal design of the GIC, Gorski-Popiel's Embedding Technique, Bruton's FDNR technique which are used for placing equivalent inductor on integrated circuits.
RANDOM VARIABLES & STOCHASTIC PROCESS (KEC-065)


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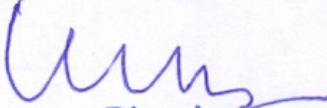
1. Explain the basic learning of Probability
2. Demonstrate the concept of Random Variables.
3. Analyze Multiple Random Variables.
4. Interpret the basics of Stochastic Processes.
5. Express Stochastic Processes in Frequency domain.
DIGITAL COMMUNICATION LAB (KEC-651)
1. To formulate basic concepts of pulse shaping in digital communication.
2. To identify different line coding techniques and demonstrate the concepts.
3. To design equipments related to digital modulation and demodulation schemes.
4. To analyze the performance of various digital communication systems and evaluate the key parameters.
5. To conceptualize error detection & correction using different coding schemes in digital communication.
CONTROL SYSTEM LAB (KEC-652)
1. Classify different tools in MATLAB along with the basic matrix operations used in MATLAB.
2. Evaluate the poles and zeros on s-plane along with transfer function of a given system.
3. Construct state space model of a linear continuous system.
4. Evaluate the various specifications of time domain response of a given system
5. Appraise the steady state error of a given transfer function.
6. Examine the relative stability of a given transfer function using various methods such as root locus, Bode plot and Nyquist plot.
MEASUREMENT & INSTRUMENTATION LAB (KEC-653A)
1. Measure the unknown resistance, capacitance and inductance using LCR Bridge, Kelvin double bridge, Schering bridge, Hay's bridge, De sauty bridge.
2. Practically demonstrate the different types of transducers like J-type, K-type, PT -100 and RTD.
3. Interpret frequency and phase difference from Lissajous figure.
4. Interpret hybrid parameters of transistor and demonstrate different transducer like LDR and LVDT.
5. Demonstrate Experiment using PLC Trainer Kits.
CAD FOR ELECTRONICS LAB (KEC-653B)
1. Design and analyze the performance of different type of inverters.
2. Design and analyze the performance of the basic logic gates using CMOS inverter circuit
3. Design and analyze the performance of the memory based digital circuits using CMOS inverter circuit.
4. Analyze the performance of the different configuration of MOS amplifier circuits.
MICROCONTROLLERS FOR EMBEDDED SYSTEM LAB (KEC-653C)
1. To understand the basis work of microcontroller and learn the working.
2. To understand the building blocks of embedded system.
3. To learn the concept of interfacing with different devices.
4. To relate the concept of memory map and memory interface.
5. To discover the characteristics of real time system.


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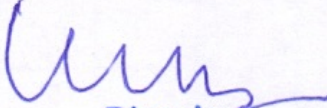
6. To validate the process using know input-output parameters.
7. Demonstrate knowledge of programs environment and executing variety of programs.
DIGITAL IMAGE PROCESSING (KEC-071)
1. Describe the concept and need for image processing.
2. Implement the various techniques for image enhancement and restoration both in spatial and frequency domains.
3. Interpret the various types of image transforms and their properties.
4. Distinguish between lossless and lossy image compression algorithms and examine their performances in spatial and frequency domains.
5. Examine the various image segmentation techniques.
VLSI DESIGN (KEC-072)
1. Express the concept of VLSI design and CMOS circuits and delay study.
2. Analyze mathematical methods and circuit analysis models in analysis of CMOS digital electronics circuits.
3. Design and analyze various combinational & sequential circuits based on CMOS technology.
4. Examine power logic circuits and different semiconductor memories used in present day technology.
5. Interpret faults in digital circuits, Fault Models and various Testing Methodologies.
OPTICAL NETWORKS (KEC-073)
1. Express the multiplexing techniques, second generation optical networks, optical layer, and optical packet switching.
2. Explain the concept of Principles of operation, Conservation of energy, Isolators and Circulators: Principles of operation.
3. Classify the basics of Multiplexing, SONET/SDH layers, SONET Frame structure, SONET/SDH physical layer, Elements of a SONET/SDH infrastructure.
4. Interpret the knowledge of Routing and wavelength assignment problems, Dimensioning Wavelength Routing Networks, Network Survivability.
5. Analyse the working of OTDM, Synchronization, Header Processing, Buffering, Burst Switching, Deployment Considerations- SONET/SDH core Network.
MICROWAVE & RADAR ENGINEERING (KEC-074)
1. Analyze various parameters and characteristics of the transmission line and waveguide and also use of wave guide component as per applications.
2. Describe, analyze and design simple microwave circuits and devices e g couplers, Attenuators, Phase Shifter and Isolators. Student will also understand the microwave propagation in ferrites.
3. Analyze the difference between the conventional tubes and the microwave tubes for the transmission of the EM waves.
4. Acquire knowledge about the handling and measurement of microwave equipment.
5. Differentiate different Radars, find applications and use of its supporting systems.


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INFORMATION THEORY & CODING (KEC-075)
1. Explain each block involved in digital communication thoroughly with applications.
2. Apply the knowledge of basic concepts of probability and entropies to analyze the behavior of a communication system.
3. Analyze the use of source coding and evaluating all the techniques of source coding.
4. Examine the significance of channel coding and evaluating all available techniques of channel coding and decoding with challenges.
5. Examine various error control coding techniques.
WIRELESS AND MOBILE COMMUNICATION (KEC-076)
1. Express the basic knowledge of mobile radio & cellular communication fundamentals and their application to propagation mechanisms, path loss models and multi-path phenomenon.
2. Analyze the performance of various voice coding and diversity techniques.
3. Apply the knowledge of wireless transmission basics to understand the concepts of equalization and multiple access techniques.
4. Examine the performance of cellular systems being employed such as GSM, CDMA and LTE using various theoretical and mathematical aspects.
5. Express basic knowledge of Mobile Adhoc networks and the existing & upcoming data communication networks in wireless and mobile communication domain.
MICRO AND SMART SYSTEMS (KEC-077)
1. Interpret the need of Microsystems and Miniaturization.
2. Design the smart materials, actuators and Micro sensors.
3. Interpret the Micromachining Technologies.
4. Analyze the modeling of solids in Microsystems.
5. Evaluate the case studies of smart systems.
SPEECH PROCESSING (KEC-078)
1. Describe the mechanism of speech production & acoustic phonetics, the acoustic theory of speech production, lossless tube models.
2. Explain time dependent processing of speech, short time energy and average magnitude, short time average zero crossing rate.
3. Design filter banks, implement filter banks and perform summation method using FFT.
4. Evaluate homomorphic system for convolution, complex cepstrum of speech, pitch detection using Homomorphic processing.
5. Interpret the basic principles of linear predictive analysis, the autocorrelation method, computation of the gain for the model, solution of LPC equations.
DIGITAL IMAGE PROCESSING LAB (KEC-751A)
1. Explain image processing operations using MATLAB tool.
2. Evaluate the appropriate methods for image enhancement and image restoration.
3. Formulate spatial and frequency domain filters to obtain better quality image.
4. Select various attributes of image such as texture and edges from the image.

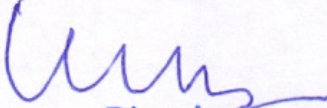

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5. Design and develop the applications of transforms such as DCT and wavelet.
VLSI DESIGN LAB (KEC-751B)
1. Designing of logic gates.
2. Implementation of combinational and sequential circuits using CMOS logic.
3. Analyze amplifier circuits.
4. Design sequential circuits such as flip flop.
5. Do the layout designing for physical analysis of the MOS transistor and MOS based circuits.
OPTICAL SYSTEM & NETWORKING LAB (KEC-751C)
1. Define the concept of Optical Systems and Networking.
2. Identify the various types of cables, connectors, routers and switches.
3. Design the various networking protocols.
4. Create various fiber optic link.
5. Interpret the basic knowledge of multiplexing and coding-decoding.
MICROWAVE & RADAR ENGINEERING LAB (KEC-751D)
1. Describe working on microwave testing bench.
2. Practically demonstrate the Characteristics of Reflex klystron using Microwave bench setup.
3. Demonstrate the performance of the Gunn diode using Microwave bench setup.
4. Perform measurement of Frequency, attenuation, VSWR, Impedance of microwave passive device using Klystron Bench Setup.
5. Interpret the basics of Smith chart for solution of transmission line problems and impedance matching.

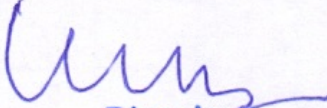

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Course Outcomes: ME

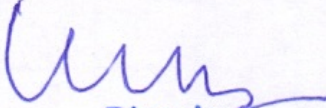
THERMODYNAMICS(KME301)
1.After completing this course, the students will be able to apply energy balance to systems and control volumes, in situations involving heat and work interactions.
2.Students can evaluate changes in thermodynamic properties of substances.
3.The students will be able to evaluate the performance of energy conversion devices.
4.The students will be able to differentiate between high grade and low-grade energies.
FLUID MECHANICS AND FLUID MACHINES(KME302)
1.Upon completion of this course, students will be able to mathematically analyze simple flow situations.
2.They will be able to evaluate the performance of pumps and turbines.
MATERIALS ENGINEERING(KME303)
1.Student will be able to identify crystal structures for various materials and understand the defects in such structures.
2.Understand how to tailor material properties of ferrous and non-ferrous alloys.
3.How to quantify mechanical integrity and failure in materials
APPLIED THERMODYNAMICS(KME401)
1.After completing this course, the students will get a good understanding of various practical power cycles and heat pump cycles.
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.
3.They will be able to understand phenomena occurring in high speed compressible flows.
ENGINEERING MECHANICS(KME402)
1.Understand the concept of stress and strain, factor of safety
2.Understand the basic component and working of beam
3.Understand the moment of inertia
4.Understand the frictional forces of two bodies
MANUFACTURING PROCESSES(KME403)
1.Understand various manufacturing processes and its various aspects, basics of metal
2.Understand the various aspect of metal forming process
3.Get familiar with different tools and operations of Sheet Metal work
4.Understand the different operations, tools of Foundry (Casting)
Heat and Mass Transfer (KME501)
1.Understand the fundamentals of heat and mass transfer
2.Apply the concept of steady and transient heat conduction
3.Apply the concept of thermal behavior of fins
4.Apply the concept of forced and free convection
5.Apply the concept of radiation for black and non-black bodies
Strength of Material (KME502)
1.Understand the concept of stress and strain under different conditions of loading
2.Determine the principal stresses and strains in structural members
3.Determine the stresses and strains in the members subjected to axial, bending and torsional loads


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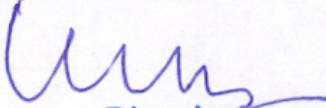
4. Apply the concepts of stresses and strain in solving problems related to springs, column and pressure vessels
5. Calculate the slope, deflection and buckling of loaded members
Industrial Engineering (KME503)
1. Understand the concept of production system, productivity, facility and process planning in various industries
2. Apply the various forecasting and project management techniques
3. Apply the concept of break-even analysis, inventory control and resource utilization using queuing theory
4. Apply principles of work study and ergonomics for design of work systems
5. Formulate mathematical models for optimal solution of industrial problems using linear programming approach
Computer Integrated Manufacturing (KME051)
1. Understand the basic concepts of automation, computer numeric control machining
2. Understand the algorithms of line generation, circle generation, transformation, curve, surface modeling and solid modeling
3. Understand group technology, computer aided process planning, flexible manufacturing, Industry 4.0, robotics
4. Understand information system and material handling in CIM environment, rapid prototyping
5. Understand information system and material handling in CIM environment, rapid prototyping
Mechatronics Systems (KME052)
1. Identify key elements of mechatronics and its representation by block diagram
2. Understand the concept of sensors and use of interfacing systems
3. Understand the concept and applications of different actuators
4. Illustrate various applications of mechatronic systems.
5. Develop PLC ladder programming and implementation in real life problem
Advance welding (KME055)
1. Understand the physics of arc welding process and various operating characteristics of welding power source
2. Analyse various welding processes and their applications
3. Apply the knowledge of welding for repair & maintenance, along with the weldability of different materials
4. Apply the concept of quality control and testing of weldments in industrial environment
5. Evaluate heat flow in welding and physical metallurgy of weldments
Refrigeration & Air Conditioning (KME601)
1. Understand the basics concepts of Refrigeration & Air-Conditioning and its future prospects
2. Explain the construction and working of various components in Refrigeration & Air-Conditioning systems
3. Understand the different types of RAC systems with their respective applications


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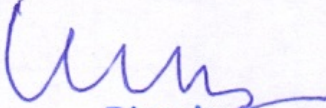
4. Apply the basic laws to the thermodynamic analysis of different processes involved in Refrigeration and Air-Conditioning
5. Apply the basic concepts to calculate the COP and other performance parameters for different RAC systems
Machine Design (KME602)
1. Recall the basic concepts of Solid Mechanics to understand the subject
2. Classify various machine elements based on their functions and applications
3. Apply the principles of solid mechanics to machine elements subjected to static and fluctuating loads
4. Analyze forces, bending moments, twisting moments and failure causes in various machine elements to be designed
5. Design the machine elements to meet the required specification
Theory of Machines (KME603)
1. Understand the principles of kinematics and dynamics of machines
2. Calculate the velocity and acceleration for 4-bar and slider crank mechanism
3. Develop cam profile for followers executing various types of motions
4. Apply the concept of gear, gear train and flywheel for power transmission
5. Apply dynamic force analysis for slider crank mechanism and balance rotating & reciprocating masses in machines.
Non-destructive Testing (KME061)
1. Understand the concept of destructive and Non-destructive testing methods
2. Explain the working principle and application of die penetrant test and magnetic particle inspection
3. Understand the working principle of eddy current inspection
4. Apply radiographic techniques for testing
5. Apply the principle of Ultrasonic testing and applications in medical and engineering areas
Gas Dynamics and Jet Propulsion (KME064)
1. Understand the concept of compressible fluid flow and flow through variable area ducts
2. Understand the basic principle and types of jet and rocket propulsion
3. Apply the basic laws for the investigation of flow through ducts
4. Apply the basic laws for the thermodynamics analysis of jet and rocket propulsion
5. Analyze the compressible flow through variable area ducts
CAD/CAM (RME701)
1. Understand various design criterial concept for designing various machine components.
2. Update knowledge on current industrial scenario and will have skills to set up and manage mechanical system in an industrial environment.
3. Understand advanced Technologies to participati in research and development based projects.


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4.Learn application of computers in designing drafting and manufacturing.
5.Understanding principles of finite element modelling
Automobile Engineering (RME702)
1.Gather complete knowledge of different vehicle, their mechanism, parts, diagnosis and maintenance.
2.Understand various manufacturing processes and composites for specific purpose and properties of material for introducing new.
3.Learn basic concepts of IC engines and system for designing a vehicle and take up the challenges of automobile industry.
4.Learn the application of various subjects such as machine design, manufacturing science, IC engine, material science, electrical m/c for designing drafting and manufacturing of different components in automobile.
5.Understand the new technologies emerging and applied in automobile industry.
Power Plant Engineering (RME071)
1.Understand various terms and factors involved in power plant calculations and Power plant economics
2.Get familiar with different systems involved in steam power plant
3.Understand the various aspects of diesel power plant and Gas turbine plant
4.Learn about nuclear power plant and Non Conventional Power Plants
5.Understand the various Instrumentation, Electrical system used in Power plant engineering
Operation Research (RME075)
1.Understand the application of operation research to solve the various technical issue of industries
2.Get optimal solution of any problem i.e. Transportation & assignment Problem
3.Get familiar with the fundamentals of Game theory and sequencing problems
4.Know the different Stochastic inventory models and will able to understand use, advantages & limitations of Simulation
5.Understand the application of queing models and various aspects of network Scheduling, CPM and PERT
Automation & Robotics (RME078)
1.Understand the working principles of Industrial Robots e.g. SCARA and Articulate Robot etc.
2.Understand the Kinematics of Industrial Robots. Also understand control system of Robots.
3.Learn Robot Programming Methods and Languages
4.Understand the application of Robots
5.Know the future trends in Industries.
Non-Destructive Testing (RME080)
1.Understand the concept of destructive and Non-destructive testing methods

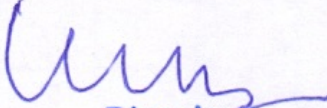

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2.Explain the working principle and application of die penetrant test and magnetic particle inspection
3.Understand the working principle of eddy current inspection
4.Apply radiographic techniques for testing
5.Apply the principle of Ultrasonic testing and applications in medical and engineering areas
Advance Welding (RME081)
1.Understand the physics of arc welding process and various operating characteristics of welding power source
2.Analyse various welding processes and their applications
3.Apply the knowledge of welding for repair & maintenance, along with the weldability of different materials
4.Apply the concept of quality control and testing of weldments in industrial environment
5.Evaluate heat flow in welding and physical metallurgy of weldments
Total Quality Management (RME085)
1.Explain the different meanings of the quality concept and its influence.
2.Describe, distinguish and use the several techniques and quality management tools.
3.Explain and distinguish the normalisation, homologation and certification activities.
4.Identify the elements that are part of the quality measuring process in the industry.
5.Predict the errors in the measuring process, distinguishing its nature and the root causes.
Renewable Energy Resources (RME086)
1.Learn about the availability and classification of various non-conventional energy resources
2.Understand the application and performance Solar thermal energy
3.Learn about resources of geothermal energy
4.Understand Thermo-electrical and thermoionic conversions
5.Understand concepts behind Biomass and its conversion theory

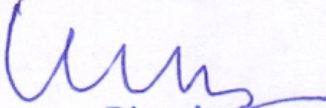

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COURSE OUTCOMES: CE

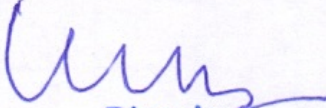
	KCE301 ENGINEERING MECHANICS
CO 1	To Use scalar and vector analytical techniques for analyzing forces in statically determinate structures
CO 2	To Apply fundamental concepts of kinematics and kinetics of particles to the analysis of simple, practical problems.
CO 3	To Apply basic knowledge of mathematics and physics to solve real-world problems
CO 4	To Understand basic dynamics concepts – force, momentum, work and energy;
CO 5	To Understand and be able to apply Newton’s laws of motion;
	KCE302 SURVEYING & GEOMATICS
CO 1	Describe the function of surveying and work with survey instruments, take observations, and prepare plan, profile, and cross-section and perform calculations.
CO 2	Calculate, design and layout horizontal and vertical curves.
CO 3	Operate a total station and GPS to measure distance, angles, and to calculate differences in elevation. Reduce data for application in a geographic information system.
CO 4	Relate and apply principles of photogrammetry for surveying.
CO 5	Apply principles of Remote Sensing and Digital Image Processing for Civil Engineering problems.
	KCE303 FLUID MECHANICS
CO 1	Understand the broad principles of fluid statics, kinematics and dynamics
CO 2	Understand definitions of the basic terms used in fluid mechanics
CO 3	Understand classifications of fluid flow
CO 4	Apply the continuity, momentum and energy principles
CO 5	Apply dimensional analysis in solving the problem
	KCE351 Building Planning & Drawing Lab
CO 1	To introduce the various commands of CAD/BIM software.
CO 2	To learn 3D drafting and rendering of structures.
CO 3	To draft elevation and cross section of doors and windows
CO 4	To learn and draw various types of staircases in BIM software.
CO 5	To plan and draw a complete residential structure.
	KCE352 Surveying and Geomatics Lab
CO 1	To study topographical maps and various conventional symbols present in it and measurement of bearings by using a prismatic compass.
CO 2	To work with Auto/Dumpy levels for finding reduced levels of given points and to carry out fly levelling.
CO 3	To work with theodolite and measuring vertical and horizontal angles.
CO 4	To study trigonometrical levelling for determining the height of the vertical structures.
CO 5	To study electronic theodolite, total station and setting out of simple circular curves by Rankine method.


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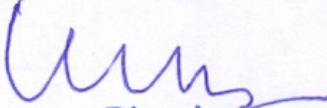
	KCE353 Fluid Mechanics Lab
CO 1	To use basic instrumentation in fluid measurement, determine accuracy of instrumentation and experimental uncertainties, demonstrate the limits of idealized governing equations
CO 2	To use the following instruments: thermometers, scales, manometers, dead weight testers, pressure gages, pressure transducers, piezo tubes, viscometers.
CO 3	To distinguish between instruments that are primary standards and those that must be calibrated using NIST traceable standards.
CO 4	To determine the accuracy of the final result. This is emphasized to show students that it is the sum of the uncertainties that is important, and that the uncertainties of various measured quantities help identify which instrument should be replaced to increase the overall accuracy.
CO 5	To prepare laboratory reports utilizing enhanced skills in presenting and interpreting experimental results.
	KCE354 Mini Project or Internship Assessment
CO 1	An understanding of professional and ethical responsibilities.
CO 2	An ability to use of various techniques, engineering knowledge and skill, and modern engineering tools necessary for planning, analysis and designing of engineering projects like building, roads, geotechnical works/problems.
CO 3	Recognition of the need for, and ability to engage in life-long learning.
CO 4	Knowledge of contemporary issues.
CO 5	An understanding of professional and ethical responsibilities.
	KCE401 Materials, Testing & Construction Practices
CO 1	Identify various building materials and to understand their basic properties.
CO 2	Understand the use of non-conventional civil engineering materials.
CO 3	Study suitable type of flooring and roofing in the construction process.
CO 4	Characterize the concept of plastering, pointing and various other building services.
CO 5	Exemplify the various fire protection, sound and thermal insulation techniques, maintenance and repair of buildings.
	KCE402 INTRODUCTION TO SOLID MECHANICS
CO 1	Describe the concepts and principles of stresses and strains
CO 2	Analyze solid mechanics problems using classical methods and energy methods
CO 3	Analyze structural members subjected to combined stresses
CO 4	Calculate the deflections at any point on a beam subjected to a combination of loads
CO 5	Understand the behavior of columns, springs and cylinders against loads.
	KCE403 HYDRAULIC ENGINEERING & MACHINES
CO 1	Apply their knowledge of fluid mechanics in addressing problems in open channels.
CO 2	Solve problems in uniform, gradually and rapidly varied flows in steady state conditions.
CO 3	Have knowledge in hydraulic machineries like pumps and turbines.
	KCE451 Material Testing Lab
CO 1	Ability to apply knowledge of mathematics and engineering in calculating the mechanical


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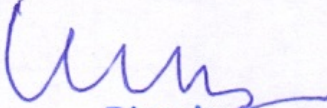
	properties of structural materials.
CO 2	Ability to function on multi-disciplinary teams in the area of materials testing
CO 3	Ability to use the techniques, skills and modern engineering tools necessary for engineering
CO 4	Understanding of professional and ethical responsibility in the areas of material testing.
CO 5	Ability to communicate effectively the mechanical properties of materials
	KCE452 Solid Mechanics Lab
CO 1	Observe and assess uncertainty in mechanical measurements and describe its causes.
CO 2	Operate and collect data using standard and non-standard experimental apparatus and procedures.
CO 3	Interpret, organize and present the results of acquired data, and discuss the outcome of experiments.
CO 4	Employ computational techniques and tools necessary for simulating physical experiments, gain confidence with and explore boundaries of these tools.
	KCE453 Hydraulics & Hydraulic Machine Lab
CO 1	To determine the total energy at various sections of pipe flow
CO 2	To determine the discharge through tanks
CO 3	To determine the discharge through pipes
CO 4	To determine the discharge through open channels
CO 5	To classify different types of flows
	CIVIL ENGINEERING (3RDYEAR)
	KCE501 GEO-TECHNICAL ENGINEERING
CO 1	To Classify the soil and determine its Index properties.
CO 2	To evaluate permeability and seepage properties of soil.
CO 3	To analyze the compaction and consolidation characteristics & effective stress concept of soil.
CO 4	To determine the vertical and shear stress under different loading conditions and explain the phenomenon of soil liquefaction.
CO 5	To interpret the earth pressure and related slope failures.
	KCE502 STRUCTURAL ANALYSIS
CO 1	To explain type of structures and method for their analysis
CO 2	To analyze different types of trusses for member forces.
CO 3	To compute slope and deflection in determinate structures using different methods.
CO 4	To apply the concept of influence lines and moving loads to compute bending moment and shear force at different sections
CO 5	To analyze determinate arches for different loading conditions.
	KCE 503 QUANTITY ESTIMATION AND CONSTRUCTION MANAGEMENT
CO 1	To understand the importance of units of measurement and preliminary estimate for administrative approval of projects.


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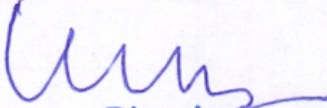
CO 2	Understand the contracts and tender documents in construction projects
CO 3	Analyze and assess the quantity of materials required for civil engineering works as per specifications.
CO 4	Evaluate and estimate the cost of expenditure and prepare a detailed rate analysis report.
CO 5	Analyze and choose cost effective approach for civil engineering projects
	KCE 051 CONCRETE TECHNOLOGY
CO 1	Understand the properties of constituent material of concrete.
CO 2	Apply admixtures to enhance the properties of concrete.
CO 3	Evaluate the strength and durability parameters of concrete
CO 4	Design the concrete mix for various strengths using difference methods.
CO 5	Use advanced concrete types in construction industry
	KCE 052 MODERN CONSTRUCTION MATERIALS
CO 1	To understand the use of modern construction materials
CO 2	To use geosynthetics and bituminous materials in constructions
CO 3	To apply knowledge of modern materials in production of variety of concrete.
CO 4	To apply knowledge of composites and chemicals in production of modern concrete.
CO 5	To use modern water proofing and insulating materials in constructions.
	KCE-053 : OPEN CHANNEL FLOW
CO 1	To apply knowledge of fluid flow for designing of channel sections
CO 2	To analyze the gradually varied flow in channel section.
CO 3	To analyze the rapidly varied flow in channel sections
CO 4	To apply numerical methods for profile computation in channels.
CO 5	To design channels for sub critical and super critical flows.
	KCE 054 ENGINEERING GEOLOGY
CO 1	Understand the scope of geological studies.
CO 2	Understand the rocks and its engineering properties.
CO 3	Understand the minerals and constituents of rocks.
CO 4	Understand the rock deformations, their causes effects and preventive measures
CO 5	Understand the ground water reserves, Geophysical exploration methods and site selection for mega projects.
	KCE055 ENGINEERING HYDROLOGY
CO 1	Understand the basic concept of hydrological cycle and its various phases.
CO 2	Understand the concept of runoff and apply the knowledge to construct the hydrograph
CO 3	Apply the various methods to assess the flood.
CO 4	Assess the quality of various forms of water and their aquifer properties
CO 5	Understand the well hydraulics and apply ground water modelling techniques.
	KCE 056 SENSOR AND INSTRUMENTATION TECHNOLOGIES FOR CIVIL ENGINEERING APPLICATIONS
CO 1	Analyze the errors during measurements


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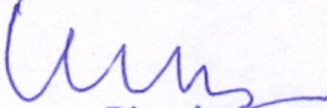
CO 2	Describe the measurement of electrical variables
CO 3	Describe the requirements during the transmission of measured signals
CO 4	Construct Instrumentation/Computer Networks
CO 5	Suggest proper sensor technologies for specific applications
CO 6	Design and set up measurement systems and do the studies
	KCE 057 AIR & NOISE POLLUTION CONTROL
CO 1	Understand air pollutants and their impacts
CO 2	Explain air pollution chemistry and meteorological aspects of air pollutants.
CO 3	Demonstrate methods for controlling particulate air pollutants.
CO 4	Demonstrate methods for controlling gaseous air pollutants.
CO 5	Understand automotive emission standards.
CO 6	Apply methods for controlling noise pollution
	KCE 058 GIS AND ADVANCE REMOTE SENSING
CO 1	Understand the concepts of Photogrammetry and compute the heights of objects
CO 2	Understand the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies
CO 3	Understand the basic concept of GIS and its applications, know different types of data representation in GIS
CO 4	Understand and Develop models for GIS spatial Analysis and will be able to know what the questions that GIS can answer are
CO 5	Illustrate spatial and non-spatial data features in GIS and understand the map projections and coordinates systems
	KCE-551 CAD Lab
CO 1	To learn the programming of MATLAB to analyze and design structures.
CO 2	To generate and analyze Object-oriented intuitive 2D/3D graphic model using STAAD.Pro.
CO 3	To understand two dimensional finite element analysis of deformation and stability in geotechnical engineering using PLAXIS software.
CO 4	To generate an ability to identify, formulate, analyze and design engineering problems for structural analysis using softwares like STAAD PRO / STRUDS / ETAB / STRAP.
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.
	KCE-552 Geotechnical Engineering Lab
CO 1	To determine the water content and specific gravity of soil
CO 2	To determine the in-situ density and relative density of soil
CO 3	To study the grain size distribution of soil and consistency limit of soil
CO 4	To determine the dry density of soil by compaction process and permeability of soil.
CO 5	To determine the shear strength of soil by direct shear test and triaxial test.
	KCE-553 Quantity Estimation and Management Lab
CO 1	To understand and estimate the quantities of various items of the building


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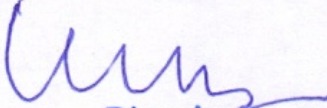
CO 2	To comprehend the knowledge of composing the contracts and tenders
CO 3	To find out the usage of various management and network techniques in the construction industry
CO 4	To study the various construction related tools and equipment
CO 5	To interpret the value of money in past, present and future time.
	KCE-554 Mini Project or Internship Assessment
CO 1	An understanding of professional and ethical responsibilities.
CO 2	An ability to use of various techniques, engineering knowledge and skill, and modern engineering tools necessary for planning, analysis and designing of engineering projects like building, roads, geotechnical works/problems.
CO 3	Recognition of the need for, and ability to engage in life-long learning.
CO 4	Knowledge of contemporary issues.
	KCE 601 DESIGN OF CONCRETE STRUCTURE
CO 1	Analyze and Design RCC beams for flexure by IS methods.
CO 2	Analyze and Design RCC beams for shear by IS methods.
CO 3	Analyze and Design RCC slabs and staircase by IS methods.
CO 4	Design the RCC compression members by IS methods.
CO 5	Design various types of footings and cantilever retaining wall
	KCE 602 TRANSPORTATION ENGINEERING
CO 1	Understand the history of road development , their alignment & Survey.
CO 2	Design the various geometric parameters of road.
CO 3	Study the traffic characteristics & design of road intersections & signals.
CO 4	Examine the properties of highway materials & their implementation in design of pavements.
CO 5	Learn methods to construct various types of roads.
	KCE 603 ENVIRONMENTAL ENGINEERING
CO 1	Assess water demand and optimal size of water mains.
CO 2	Layout the distribution system & assess the capacity of reservoir.
CO 3	Investigate physical, chemical & biological parameter of water.
CO 4	Investigate physical, chemical & biological parameter of water.
CO 5	Apply emerging technologies for treatment of waste water.
	KCE 061 ADVANCE STRUCTURAL ANALYSIS
CO 1	Analyze indeterminate structure to calculate unknown forces, slope and deflections by different methods.
CO 2	Apply principle of influence lines to analyze indeterminate beams and arches.
CO 3	Analyze and design cable structure with their influence line diagram.
CO 4	Apply basics of force and stiffness methods of matrix analysis for beams, frames and trusses.
CO 5	Apply the basic of plastic analysis to analyze the structure by using different mechanism.


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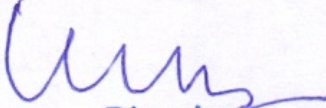
	KCE062 RIVER ENGINEERING
CO 1	Explain river morphology and its classification
CO 2	Explain hydraulic geometry and behavior of river.
CO 3	Explain socio-cultural influences and ethics of stream restorations.
CO 4	Analyze flow and sediment transport in rivers and channels.
CO 5	Design guide band, embankments and flood protection systems
	KCE063 REPAIR AND REHABILITATION OF STRUCTURES
CO 1	Understand the fundamentals of maintenance and repair strategies.
CO 2	Identify for serviceability and durability aspects of concrete.
CO 3	Know the materials and techniques used for repair of structures.
CO 4	Decide the appropriate repair and retrofitting techniques.
CO 5	Use appropriate health monitoring technique and demolition methods
	KCE 064 FOUNDATION DESIGN
CO 1	Understand various methods of Soil Exploration and its importance.
CO 2	Analyze bearing capacity and settlement of soil for shallow foundation
CO 3	Design the various types of shallow foundation and understand the basics of deep foundation.
CO 4	Understand the characteristics of well foundations and retaining wall.
CO 5	Understand the concept of soil reinforcement.
	KCE 651 Transportation Engineering Lab
CO 1	To Identify engineering properties of aggregate.
CO 2	To Identify the grade & properties of bitumen.
CO 3	To find out peak hour traffic & peak time for a given location on the road.
CO 4	To calculate design speed, maximum speed & minimum speed limits of a location through spot speed.
CO 5	To plot parking accumulation curve and find out parking duration & turnover of parking lot/stretch.
	KCE 652 Environmental Engineering Lab
CO 1	To determine turbidity, color and conductivity and pH of a given water sample.
CO 2	To determine permanent and temporary hardness of a given water sample & also determine plain, pre and post chlorination and also explain break point chlorination.
CO 3	To determine BOD & COD of a water sample.
CO 4	To determine kjeldhal nitrogen, and give there permissible limit & MPN (Most probable number).
CO 5	To determine permissible limit of sulphate in waste and drinking water & also to determine the level of Noise pollution.
	KCE 653 Structural Detailing Lab
CO 1	To understand Maxwell's Reciprocal theorem.
CO 2	To analyze the horizontal thrust in a three-hinged arch and to draw influence line diagrams for Horizontal Thrust end Bending moment
CO 3	To analyze the horizontal thrust in a two hinged arch and to draw influence line diagrams


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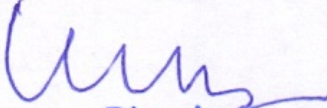
	for horizontal Thrust and bending moment
CO 4	To Study and understand the SP34/IS13920/IS456:2000 for detailing of structural elements
CO 5	To study the Detailing of buildings with respect to Earthquake Resistant Design
	CIVIL ENGINEERING (4th YEAR)
	RCE071 Geology and Soil Mechanics
CO 1	To identify different types of rocks and understand their structures, textures and classification
CO 2	Understand various deformations like fold, fault and joint found in the rock and their effect on engineering construction.
CO 3	Student will recognize underground provinces and its role as geological hazard. Also understand the causes and classification of earthquake and landslide
CO 4	To understand the geophysical explorations methods for subsurface structures. Have the knowledge of site selection for dam, reservoir, bridges and highway.
CO 5	Student will able to determine soil physical characteristics, identify and classify soil based on standard geotechnical engineering practice.
	RCE076 Railways, Airport & Water Ways
CO 1	To study History and administrative setup of Indian Railways and functions, requirements and cross section of Permanent way.
CO 2	To study Track Geometrics, Turnouts and Crossings, Stations and Yards and their terminologies.
CO 3	To study Signaling and Interlocking, Urban Railways and high speed track requirements.
CO 4	To study Air craft characteristics affecting airport planning & design, selection of site for an airport.
CO 5	To study Harbors, ports, Inland waterways and components and operational Tidal data and analyses.
	RCE701 Design of Structure-III
CO 1	To provide degree of graduation with the necessary knowledge and skills for deal with the challenges in real world.
CO 2	To create better planning strategies which include interactions between design of steel structures, economy, actual requirement, and consideration of natural environment.
CO 3	Apply the scientific principles, technical information and imagination for the development of new or improved steel structures and its connection systems in construction sector.
CO 4	Designing of steel beams, steel columns, frames and its necessary connections for implementation in various project of steel structures.
CO 5	This course also serves as a foundation of future coursework in the steel structure field for research work in Construction Industry for improved design and safety.
	RCE702 Water Resources
CO 1	To Describe the Various components of Hydrological cycle and Identify the basic requirements of irrigation, water requirement of crops and classify canal irrigation. Distribution systems for canal irrigation Ability to know about properties of sediment and about reservoir sedimentation
CO 2	To understand about the basics of design of unlined and lined irrigation canals and


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	interprets the causes and effects of water-logging.
CO 3	To analyze river flow hydraulics
CO 4	To describe the various working principles of different components of diversion head works and canal regulators
CO 5	To perform stability analysis of concrete gravity dams, stability analysis of earth and rock-fill dams and to know about measures for their slopes protection, different components and their arrangement for hydel plants of both run off river plants and pumped storage plants, to know about design principles of various types hydraulic structures e.g., spillways etc.
	RCE751 Non Destructive Testing Laboratory
CO 1	To understand the Non Destructive Testing of reinforced cement concrete for strength assessment using rebound hammer & pull out method.
CO 2	To check the quality control of hardened concrete with the help of ultrasonic pulse velocity test.
CO 3	To assess the corrosion of reinforcing bars using half cell potentiometer
CO 4	To Perform the test on the structural steel for corrosion.
CO 5	To compare the welding performance with Di-penetration test, ultrasonic test & magnetic particle test in structural steel.
	RCE752 Mini Project
CO 1	To understand the professional and ethical responsibilities.
CO 2	To use various techniques, engineering knowledge and skill, and modern engineering tools necessary for planning, analysis and designing of engineering projects like building, roads, geotechnical works/problems.
CO 3	To recognize the need for, and ability to engage in life-long learning.
CO 4	To have the knowledge of contemporary issues.
CO 5	To understand the professional and ethical responsibilities.
	RCE753 Industrial Training
CO 1	To study about various type of waste and there sources in various industrial processes.
CO 2	To study about removal of specific pollutant in industrial waste water and concept of zero discharge effluent.
CO 3	To study about solid waste generation and disposal mgmt. and generation control mgmt. of noise and gaseous emission.
CO 4	To introduce recent trends in industrial waste mgmt. in various industries, e.g., dairy, fertilizer, sugar, pulp & paper etc.
CO 5	To introduce environmental auditing in industrial mgmt. and various legislation and standards like ISO14000.
	RCE754 Project-1
CO 1	To Work in a group to identify a problem for project work.
CO 2	To review the available literature on the chosen problem.
CO 3	To formulate the methodology and material used, if any to solve the identified problem.

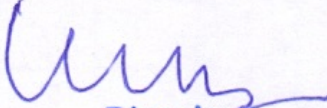

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CO 4	To apply the principles, tools and techniques to analyze the problem and understand the scope of the study.
CO 5	To prepare a presentation and submit project report.
	RCE084 Solid Waste Management
CO 1	To understand the Basic Concepts of Solid Waste Management.
CO 2	To understand the hierarchy of solid waste management.
CO 3	The student will be able to design engineered landfills.
CO 4	To understand the route optimization of solid waste collection.
CO 5	To learn the concept of E-waste, bio-medical waste and hazardous waste management.
	RCE085 Engineering Hydrology and Ground Water Management
CO 1	To ability to know the concept of hydrologic cycle and to quantify evaporation and infiltration processes.
CO 2	To ability to know the concept of unit hydrograph and to review various rational and conceptual rainfall-runoff models.
CO 3	To ability to perform real time flood forecasting.
CO 4	To know the basic principles and movement of ground water and properties of ground water and to know about well hydraulics and design principles of well.
CO 5	To get concept of various surface and subsurface geophysical methods for groundwater explorations, management and modeling.
	RCE851 Seminar
CO 1	To widen the scope of knowledge of each student by requiring him/her to participate in seminars of varying research topic.
CO 2	To develop and improve confidence in presentation skills and techniques.
CO 3	To enable students to learn the art of public speaking
CO 4	To enable students to explore their area of interest by allowing them to select any topic of their choice.
CO 5	To enable students to explore the latest trends of civil engineering.
	RCE852 Project-2
CO 1	To Work in a group to identify a problem for project work.
CO 2	To review the available literature on the chosen problem.
CO 3	To formulate the methodology and material used, if any to solve the identified problem.
CO 4	To apply the principles, tools and techniques to analyze the problem and understand the scope of the study.
CO 5	To prepare a presentation and submit project report.

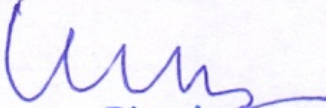

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COURSE OUTCOMES: IT

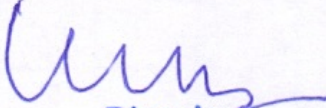
Maths IV (KAS-402)
1. Remember the concept of partial differential equation and to solve partial differential equations.
2. Analyze the concept of partial differential equations to evaluate the problems concerned with partial differential equations.
3. Understand the concept of correlation, moments, skewness and kurtosis and curve fitting.
4. Remember the concept of probability to evaluate probability distributions.
5. Apply the concept of hypothesis testing and statistical quality control to create control charts.
Universal Human Values and Professional Ethics (KVE-401)
1. 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. Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body
3. 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
4. Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature
5. Distinguish between ethical and unethical practices and start working out the strategy to actualize a harmonious environment wherever they work.
Operating System (KCS-401)
1. Understand the structure and functions of OS
2. Learn about Processes, Threads and Scheduling algorithms.
3. Understand the principles of concurrency and Deadlocks
4. Learn various memory management scheme
5. Study I/O management and File systems.
Theory of Automata and Formal languages (KCS-402)
1. Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars
2. Analyse and design, Turing machines, formal languages, and grammars
3. Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving
4. Prove the basic results of the Theory of Computation.
5. State and explain the relevance of the Church-Turing thesis.


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Web Designing (KIT-401)
1. Understand principle of Web page design and about types of websites
2. Visualize and Recognize the basic concept of HTML and application in web designing.
3. Recognize and apply the elements of Creating Style Sheet (CSS).
4. Understanding the basic concept of Java Script and its application.
5. Introduce basics concept of Web Hosting and apply the concept of SEO
Python Programming (KNC-402) (MOOC)
1.To read and write simple Python programs.
2.To develop Python programs with conditionals and loops.
3. To define Python functions and to use Python data structures -- lists, tuples, dictionaries
4. To do input/output with files in Python
5.To do searching, sorting and merging in Python
Microprocessor (KCS-403)
1.Apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
2. Analyze a detailed s/w & h/w structure of the Microprocessor.
3. Illustrate how the different peripherals (8085/8086) are interfaced with Microprocessor.
4. Analyze the properties of Microprocessors(8085/8086)
5. Evaluate the data transfer information through serial & parallel ports.
Operating System Lab (KCS-451)
1. To understand the different operating system available
2.To perform CPU scheduling algorithm
3.To understand and perform banker's algorithm
4.To calculate the external and internal fragmentation.
5.To understand and perform different file storage allocation technique.
Microprocessor Lab (KCS-452)
1. 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.
2. Examine 8085 microprocessor and its interfacing with peripheral devices.
3: State various conversion techniques using 8085 and generate waveforms using 8085.
4. Implement programming concept of 8085 Microprocessor.
5 Design concepts to interface peripheral devices with Microprocessor so as to design Microprocessor based projects.
Web Designing Lab (KIT-451)


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1. Understand principle of Web page design and about types of websites
2. Visualize and Recognize the basic concept of HTML and application in web designing.
3. Recognize and apply the elements of Creating Style Sheet (CSS).
4. Understanding the basic concept of Java Script and its application.
5. Introduce basics concept of Web Hosting and apply the concept of SEO
Python Language Programming Lab (KCS-453)
1.To understand the basic syntax of simple python programs.
2.To create the problem uses conditionals and loops in python
3. To understand and create python functions and to use string, lists, tuples, set, dictionaries python data structures
4. To understand and create the concept of input/output with files in Python
5. To perform searching, sorting and merging in Python
Software Engineering (KCS-601)
1. Explain various software characteristics and analyze different software Development Models.
2. Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards.
3. Compare and contrast various methods for software
4. Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing
5. Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.
Data Analytics (KIT-601)
1. Discuss various concepts of data analytics pipeline.
2. Apply classification and regression techniques.
3. Explain and apply mining techniques on streaming data.
4. Compare different clustering and frequent pattern mining algorithms.
5. Describe the concept of R programming and implement analytics on Big data using R.
Computer Network (KCS-603)
1. 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
2. Apply channel allocation, framing, error and flow control techniques.
3. Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.
4. Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism
5. Explain the functions offered by session and presentation layer and their Implementation


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6. Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.

Indian Tradition, Culture and Society (KNC-602)

1. 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

2. To enable the students to understand the importance of our surroundings and encourage the students to contribute towards sustainable development.

3. To sensitize students towards issues related to 'Indian' culture, tradition and its composite character.

4. To make students aware of holistic lifestyles of Yogic-science and wisdom capsules in Sanskrit literature that are important in modern society with rapid technological advancements and societal disruptions.

5. To acquaint students with Indian Knowledge System, Indian perspective of modern scientific worldview and basic principles of Yoga and holistic health care system.

Data Compression (KCS-064)

1. Describe the evolution and fundamental concepts of Data Compression and Coding Techniques.

2. Apply and compare different static coding techniques (Huffman & Arithmetic coding) for text compression.

3. Apply and compare different dynamic coding techniques (Dictionary Technique) for text compression.

4. Evaluate the performance of predictive coding technique for Image Compression.

5. Apply and compare different Quantization Techniques for Image Compression.

Embedded System (KOE-062)

1. Understand the basics of embedded system and its structural units.

2. Analyze the embedded system specification and develop software programs.

3. Evaluate the requirements of the programming embedded systems, related software architecture.

4. Understand the RTOS based embedded system design.

5. Understand all the applications of the embedded system and designing issues.

Software Project Management (KOE-068)

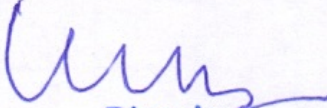
1. Identify project planning objectives, along with various cost/effort estimation models.

2. Organize & schedule project activities to compute critical path for risk analysis.

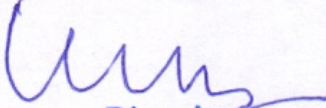
3. Monitor and control project activities.

4. Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.

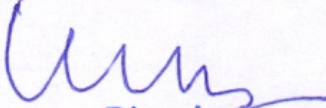
5. Configure changes and manage risks using project management tools.


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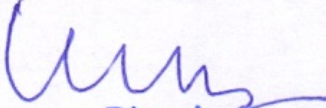
Understanding the human being comprehensively human aspirations and its fulfilment (KOE-069)
1. To help the students having the clarity about human aspirations, goal, activities and purpose of life
2. To facilitate the competence to understand the harmony in nature/existence and participation of human being in the nature/existence.
3. To help the students to develop the understanding of human tradition and its various components.
Software Engineering Lab (KCS-651)
1. Identify ambiguities, inconsistencies and incompleteness from a requirements specification and state functional and non-functional requirement
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
3. Draw a class diagram after identifying classes and association among them
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
5. Able to use modern engineering tools for specification, design, implementation and testing
Computer Networks Lab (KCS-653)
1..Simulate different network topologies.
2. Implement various framing methods of Data Link Layer.
3. Implement various Error and flow control techniques.
4. Implement network routing and addressing techniques.
5.Implement transport and security mechanisms
Data Analytics Lab (KIT-651)
1. Implement numerical and statistical analysis on various data sources
2. Apply data pre-processing and dimensionality reduction methods on raw data
3. Implement linear regression technique on numeric data for prediction
4. Execute clustering and association rule mining algorithms on different datasets
5. Implement and evaluate the performance of KNN algorithm on different datasets
Machine Learning (RCS-080)
1. To understand the need for machine learning for various problem solving.
2. To understand a wide variety of learning algorithms and how to evaluate models generated from data.
3. To understand the latest trends in machine learning.
4. To design appropriate machine learning algorithms and apply the algorithms to a real-world problem.


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5. To optimize the models learned and report on the expected accuracy that can be achieved by applying the models.
Data Compression (RCS-087)
1. Describe the evolution and fundamental concepts of Data Compression and Coding Techniques.
2. Apply and compare different static coding techniques (Huffman & Arithmetic coding) for text compression.
3. Apply and compare different dynamic coding techniques (Dictionary Technique) for text compression.
4. Evaluate the performance of predictive coding technique for Image Compression.
5. Apply and compare different Quantization Techniques for Image Compression.
Entrepreneurship Development (ROE-082)
1. To understand the importance of entrepreneurship development in national context.
2. To apply tools and techniques for project identification, assessment, formulation, evaluation, and financing small projects.
3. To apply formulation and interpretation of accounting data through financial statements.
4. To analyze financial functions and approaches to project planning, control and capital management to judge financial strength of a company.
5. To evaluate legal framework and agencies related to entrepreneurship.
Renewable Energy Resources (ROE-086)
1. To understand basic of Primary and Secondary energy Resources.
2. Understanding domain of development of system of Non-Conventional Sources of Energy
3. Analyzing existing sources of energy comprehensively.
4. Analysis the need and verify the requirements of customer and environments.
5. Analyze and Demonstrate various resources of energy at global level.
Values, Relationship & Ethical Human Conduct-For a Happy & Harmonious Society (ROE-088)
1. Realize the goals in society towards world family
2. Evaluate the Culture and Civilization and Human Conduct.
3. Implement the conceptual framework for universal human order
4. Develop program for Undivided Society and Universal Human Order
5. Implement steps for transition from present state to human society and order
Project II (RIT-852)
1. Get an opportunity to identify a realistic problem for the project as per their skills and interests.
2. Get an opportunity to work in groups of 3-4, with diverse skill levels and interdependent roles.


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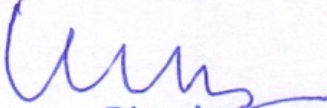
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|---|
| 3. Design a system, component, or process to meet desired needs within realistic constraints. |
| 4. Function on multidisciplinary teams. |
| 5. Identify, formulate, and solve engineering problems by implementing the latest technology. |
| 6. Able to understand how to write technical reports/manuals for the project work. |
| 7. Propose, evaluate and develop new solutions/processes/systems/components to a variety of problems in information technology field. |



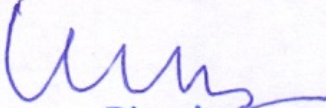
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COURSE OUTCOMES: CSE

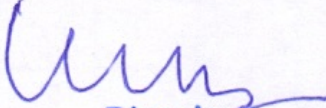
Data Structure (KCS301 T)
1. Describe how arrays, linked lists, stacks, queues, trees, and graphs are represented in memory, used by the algorithms and their common applications.
2. Discuss the computational efficiency of the sorting and searching algorithms.
3. Implementation of Trees and Graphs and perform various operations on these data structure.
4. Understanding the concept of recursion, application of recursion and its implementation and removal of recursion.
5. Identify the alternative implementations of data structures with respect to its performance to solve a real world problem.
Computer Organization and Architecture (KCS302 T)
1. Study of the basic structure and operation of a digital computer system.
2. Analysis of the design of arithmetic & logic unit and understanding of the fixed point and floatingpoint arithmetic operations.
3. Implementation of control unit techniques and the concept of Pipelining
4. Understanding the hierarchical memory system, cache memories and virtual memory
5. Understanding the different ways of communicating with I/O devices and standard I/O interfaces
Discrete Structures & Theory of Logic (KCS303 T)
1. Write an argument using logical notation and determine if the argument is or is not valid.
2. Understand the basic principles of sets and operations in sets.
3. Demonstrate an understanding of relations and functions and be able to determine their properties.
4. Demonstrate different traversal methods for trees and graphs.
5. Model problems in Computer Science using graphs and trees.
Technical Communication (KAS301/401 T)
1. Students will be enabled to understand the nature and objective of Technical Communication relevant for the work place as Engineers.
2. Students will utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.
3. Students would imbibe inputs by presentation skills to enhance confidence in face of diverse audience.
4. Technical communication skills will create a vast know-how of the application of the learning to promote their technical competence.
5. It would enable them to evaluate their efficacy as fluent & efficient communicators by learning the voice-dynamics.


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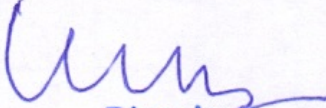
Introduction to Soft Computing (KOE036/046 T)
1. Comprehend the fuzzy logic and the concept of fuzziness involved in various systems and fuzzy set theory.
2. Understand the concepts of fuzzy sets, knowledge representation using fuzzy rules, approximate reasoning, fuzzy inference systems, and fuzzy logic
3. Describe with genetic algorithms and other random search procedures useful while seeking global optimum in selflearning situations.
4. Understand appropriate learning rules for each of the architectures and learn several neural network paradigms and its applications.
5. Develop some familiarity with current research problems and research methods in Soft Computing Techniques.
Computer System Security (KNC 301 T)
1 .To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats.
2. To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats.
3. To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.
4. To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios.
5. To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.
Python Programming (KNC 302 T)
1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and to use Python data structures – lists, tuples, dictionaries.
4. To do input/output with files in Python.
5. To do searching, sorting and merging in Python.
Data Structures Using C Lab (KCS351 P)
1. Implement various operations to be performed on array.
2. Implement the operations on graph and linked list.
3. Implement stack as well as queue.
4. Create, traverse and implement tree structures.
5. Implement various searching and sorting techniques.
Computer Organization Lab (KCS 352 P)


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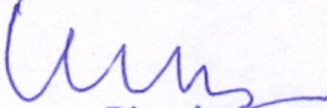
1. Analyze the behaviour of logic gates and illustrate HALF ADDER, FULL ADDER using basic logic gates and to learn various code conversions: Binary -to -Gray, Gray -to -Binary
2. Design combinational circuits for basic components of computer system and applications
3. Demonstrate excitation tables of various FLIP-FLOPS and design of an 8-bit Input/ Output system with four 8-bit Internal Registers.
4. Design of an 8-bit ARITHMETIC LOGIC UNIT.
5. Designing of I/O using Registers, ALU and Control Unit and demonstrating the usage of Register Transfer Language (RTL)
Discrete Structure & Logic Lab (KCS353 P)
1. Implement the concepts of set theory such as sets relations, functions, and integers in C Language/Maple
2. Understand and discuss various algebraic structures and properties of modern algebra.
3. Verify the correctness of an argument using propositional and predicate logic and truth tables.
4. Analyse and solve the problems in different areas of computer science using trees and graphs.
5. Applying advanced counting and computing techniques like generating function and recurrence relation to solve the recursive problems.
Operating systems (KCS401 T)
1. Understand the structure and functions of OS
2. Learn about Processes, Threads and Scheduling algorithms.
3. Understand the principles of concurrency and Deadlocks
4. Learn various memory management scheme
5. Study I/O management and File systems.
Theory of Automata and Formal Languages (KCS402 T)
1. Analyse and design finite automata, pushdown automata, Turing machines, formal languages, and grammars
2. Analyse and design, Turing machines, formal languages, and grammars
3. Demonstrate the understanding of key notions, such as algorithm, computability, decidability, and complexity through problem solving
4. Prove the basic results of the Theory of Computation.
5. State and explain the relevance of the Church-Turing thesis.
Microprocessor (KCS403 T)
1. Apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
2. Analyze a detailed s/w & h/w structure of the Microprocessor.
3. Illustrate how the different peripherals (8085/8086) are interfaced with Microprocessor.
4. Analyze the properties of Microprocessors(8085/8086)


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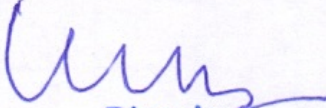
5. Evaluate the data transfer information through serial & parallel ports.
Universal Human Values and Professional Ethics (KVE-401 T)
1. Understand the significance of value inputs in a classroom, distinguish between values and skills, understand the need, basic guidelines, content and process of value education, explore the meaning of happiness and prosperity and do a correct appraisal of the current scenario in the society
2. Distinguish between the Self and the Body, understand the meaning of Harmony in the Self the Co-existence of Self and Body.
3. 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
4. Understand the harmony in nature and existence, and work out their mutually fulfilling participation in the nature.
5. Distinguish between ethical and unethical practices, and start working out the strategy to actualize a harmonious environment wherever they work.
Mathematics-IV(KAS402 T)
1.The idea of partial differentiation and types of partial differential equations
2.The idea of classification of second partial differential equations, wave , heat equation and transmission lines
3.The basic ideas of statistics including measures of central tendency, correlation, regression and their properties.
4. The idea s of probability and random variables and various discrete and continuous probability distributions and their properties.
5. The statistical methods of studying data samples, hypothesis testing and statistical quality control, control charts and their properties.
Python Programming (KNC-402 T)
1. To read and write simple Python programs.
2. To develop Python programs with conditionals and loops.
3. To define Python functions and to use Python data structures – lists, tuples, dictionaries.
4. To do input/output with files in Python.
5. To do searching, sorting and merging in Python.
Computer System Security (KNC401 T)
1 .To discover software bugs that pose cyber security threats and to explain how to fix the bugs to mitigate such threats.
2. To discover cyber attack scenarios to web browsers and web servers and to explain how to mitigate such threats.


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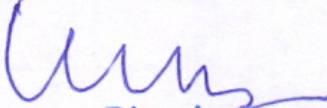
3. To discover and explain mobile software bugs posing cyber security threats, explain and recreate exploits, and to explain mitigation techniques.
4. To articulate the urgent need for cyber security in critical computer systems, networks, and world wide web, and to explain various threat scenarios.
5. To articulate the well known cyber attack incidents, explain the attack scenarios, and explain mitigation techniques.
Operating Systems Lab (KCS451 P)
1. To execute various unix commands for process and file management as well as input/output system calls.
2. To implement various preemptive and non preemptive CPU scheduling policies.
3. To understand the concept of Deadlock and implementation of banker's algorithm.
4. To understand and implement various memory and file management techniques.
5. To understand and implement various inter process communication techniques.
Microprocessor Lab (KCS452 P)
1. 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.
2. Examine 8085 microprocessor and its interfacing with peripheral devices.
3. State various conversion techniques using 8085 and generate waveforms using 8085.
4. Implement programming concept of 8085 Microprocessor.
5. Design concepts to interface peripheral devices with Microprocessor so as to design Microprocessor based projects.
Python Language Programming Lab (KCS453 P)
1. Write, test, and debug simple Python programs.
2. Implement Python programs with conditionals and loops.
3. Develop Python programs step-wise by defining functions and calling them.
4. Use Python lists, tuples, dictionaries for representing compound data.
5. Read and write data from/to files in Python
Database Management System (KCS501 T)
1. Apply knowledge of database for real life applications.
2. Apply query processing techniques to automate the real time problems of databases.
3. Identify and solve the redundancy problem in database tables using normalization.
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.
5. Design, develop and implement a small database project using database tools.
Compiler Design (KCS-502 T)


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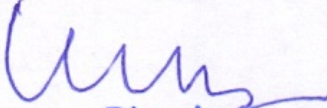
1. Acquire knowledge of different phases and passes of the compiler and also able to use the compiler tools like LEX, YACC, etc. Students will also be able to design different types of compiler tools to meet the requirements of the realistic constraints of compilers.
2. Understand the parser and its types i.e. Top-Down and Bottom-up parsers and construction of LL, SLR, CLR, and LALR parsing table.
3. Implement the compiler using syntax-directed translation method and get knowledge about the synthesized and inherited attributes.
4. Acquire knowledge about run time data structure like symbol table organization and different techniques used in that.
5. Understand the target machine's run time environment, its instruction set for code generation and techniques used for code optimization.
Design and Analysis of Algorithm (KCS503 T)
1. Design new algorithms, prove them correct, and analyze their asymptotic and absolute runtime and memory demands.
2. Find an algorithm to solve the problem (create) and prove that the algorithm solves the problem correctly (validate).
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.
4. Apply classical sorting, searching, optimization and graph algorithms.
5. Understand basic techniques for designing algorithms, including the techniques of recursion, divide-and-conquer, and greedy.
Data Analytics (KCS-051 T)
1. Describe the life cycle phases of Data Analytics through discovery, planning and building.
2. Understand and apply Data Analysis Techniques.
3. Implement various Data streams.
4. Understand item sets, Clustering, frame works & Visualizations.
5. Apply R tool for developing and evaluating real time applications.
Machine Learning Techniques (KCS 055 T)
1. To understand the need for machine learning for various problem solving
2. To understand a wide variety of learning algorithms and how to evaluate models generated from data
3. To understand the latest trends in machine learning
4. To design appropriate machine learning algorithms and apply the algorithms to a real-world problems
5. To optimize the models learned and report on the expected accuracy that can be achieved by applying the models
Database Management Systems Lab (KCS-551 P)
1. Understand and apply oracle 11 g products for creating tables, views, indexes, sequences and other database objects.


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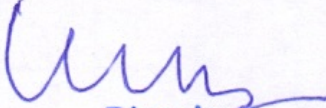
2. Design and implement a database schema for company data base, banking data base, library information system, payroll processing system, student information system.
3. Write and execute simple and complex queries using DDL, DML, DCL and TCL.
4. Write and execute PL/SQL blocks, procedure functions, packages and triggers, cursors.
5. Enforce entity integrity, referential integrity, key constraints, and domain constraints on database
Compiler Design Lab (KCS-552 P)
1. Identify patterns, tokens & regular expressions for lexical analysis.
2. Design Lexical analyser for given language using C and LEX /YACC tools
3. Design and analyze top down and bottom up parsers.
4. Generate the intermediate code
5. Generate machine code from the intermediate code forms
Design and Analysis of Algorithm Lab (KCS-553 P)
1. Implement algorithm to solve problems by iterative approach.
2. Implement algorithm to solve problems by divide and conquer approach
3. Implement algorithm to solve problems by Greedy algorithm approach.
4. Implement algorithm to solve problems by Dynamic programming, backtracking, branch and bound approach.
5. Implement algorithm to solve problems by branch and bound approach.
Software Engineering (KCS-601 T)
1. Explain various software characteristics and analyze different software Development Models.
2. Demonstrate the contents of a SRS and apply basic software quality assurance practices to ensure that design, development meet or exceed applicable standards.
3. Compare and contrast various methods for software.
4. Formulate testing strategy for software systems, employ techniques such as unit testing, Test driven development and functional testing.
5. Manage software development process independently as well as in teams and make use of Various software management tools for development, maintenance and analysis.
Web Technology (KCS-602 T)
1. Explain web development Strategies and Protocols governing Web.
2. Develop Java programs for window/web-based applications.
3. Design web pages using HTML, XML, CSS and JavaScript.
4. Creation of client-server environment using socket programming.
5. Building enterprise level applications and manipulate web databases using JDBC.
6. Design interactive web applications using Servlets and JSP.
Computer Networks(KCS- 603 T)


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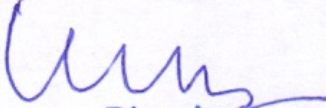
1. Explain basic concepts, OSI reference model, services and role of each layer of OSI model and TCP/IP, networks devices and transmission media, Analog and digital data transmission
2. Apply channel allocation, framing, error and flow control techniques.
3. Describe the functions of Network Layer i.e. Logical addressing, subnetting & Routing Mechanism.
4. Explain the different Transport Layer function i.e. Port addressing, Connection Management, Error control and Flow control mechanism.
5. Explain the functions offered by session and presentation layer and their Implementation.
6. Explain the different protocols used at application layer i.e. HTTP, SNMP, SMTP, FTP, TELNET and VPN.
Image Processing (KCS-062 T)
1. Explain the basic concepts of two-dimensional signal acquisition, sampling, quantization and color model.
2. Apply image processing techniques for image enhancement in both the spatial and frequency domains.
3. Apply and compare image restoration techniques in both spatial and frequency domain.
4. Compare edge based and region based segmentation algorithms for ROI extraction.
5. Explain compression techniques and descriptors for image processing.
Software Project Management (KOE-068 T)
1. Identify project planning objectives, along with various cost/effort estimation models.
2. Organize & schedule project activities to compute critical path for risk analysis.
3. Monitor and control project activities.
4. Formulate testing objectives and test plan to ensure good software quality under SEI-CMM.
5. Configure changes and manage risks using project management tools.
Understanding The Human Being Comprehensively Human Aspirations And Its Fulfilment (KOE-069 T)
1. To understand basic human aspiration and their fulfillment through right understanding and resolution.
2. Understanding domain of Right Understanding starting through human being up to entire existence.
3. Analyzing Right Understanding of human being comprehensively.
4. Analysis the need and verify the proposals of the inner evolution through the self-exploration leading to awakening of the activities of realization.
5. Analyze and Demonstrate Undivided Human Society, Universal Human Order and Human Tradition
Indian Tradition, Culture and Society (KNC602 T)
1. Identify, explore and enhance the ability to understand the basic features of Society State and Polity in India.
2. To understand and follow Indian Literature, Culture, Traditions and Practices.


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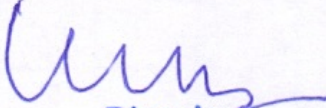
3. To understand and explain the basis of Indian Religion, Philosophy and Practices.
4. To understand the basics of Science, Management and Indian Knowledge System.
5. To connect up with the knowledge of scientific perspective of Indian Cultural Heritage and Performing Arts.
Software Engineering Lab (KCS-651 P)
1. Identify ambiguities, inconsistencies and incompleteness from a requirements specification and state functional and non-functional requirement
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
3. Draw a class diagram after identifying classes and association among them
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
5. Able to use modern engineering tools for specification, design, implementation and testing
Web Technology Lab (KCS-652 P)
1. Develop static web pages using HTML
2. Develop Java programs for window/web-based applications.
3. Design dynamic web pages using Javascript and XML.
4. Design dynamic web page using server site programming Ex. ASP/JSP/PHP
5. Design server site applications using JDDC, ODBC and session tracking API
Computer Networks Lab (KCS-653 P)
1. Simulate different network topologies.
2. Implement various framing methods of Data Link Layer.
3. Implement various Error and flow control techniques.
4. Implement network routing and addressing techniques.
5. Implement transport and security mechanisms


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Distributed System (RCS-701 T)
1. Understand the key mechanism of logical clock, models for distributed systems and concepts in message passing.
2. Analyze the algorithms of distributed mutual exclusion and deadlock detections.
3. Understand the concept of failure detection, shared memory, agreement protocols and group communication in distributed system.
4. Learn and analyze the concepts of failure recovery and fault tolerance in distributed system.
5. Apply the concepts of database to understand the concept of distributed transactions, concurrency control and replication in distributed database
Artificial Intelligence (RCS702 T)
1. Understand the concepts of artificial intelligence including computer vision, natural language processing.
2. Analyze and implement the various searching algorithms like Uninformed search, Informed search, Adversarial search, Game search strategies.
3. Retrieve and apply the concepts of knowledge representation and inference with Propositional Logic, First Order Logic.
4. Understand and compare the concept of supervised and unsupervised learning.
5. Analyze the techniques of pattern recognition including statistical pattern recognition.
Understanding Human Being Comprehensively (ROE074 T)
1. To understand basic human aspiration and their fulfillment through right understanding and resolution.
2. Understanding domain of Right Understanding starting through human being up to entire existence.
3. Analyzing Right Understanding of human being comprehensively.
4. Analysis the need and verify the proposals of the inner evolution through the self-exploration leading to awakening of the activities of realization.
5. Analyze and Demonstrate Undivided Human Society, Universal Human Order and Human Tradition
Human Computer Interface (RCS-073 T)
1. Understand the concept of Human-Computer Interaction (HCI), Graphical User Interface (GUI) and Web User Interface.
2. Analyze the impact of human characteristics in HCI design process
3. Explain the concept of organizing and presentation of screen in screen designing.
4. Understand the components and concept of colors in windows designing.
5. Apply the concepts of software tools to build Human Computer Interface
Cloud Computing (RCS-075 T)
1. Understand the basic concepts of Cloud Computing.
2. Identify the techniques of Service Oriented Architecture and Virtualization.
3. Analyze the Cloud Architecture, services and storage.


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4. Describe concepts of resource management and security in Cloud.
5. Describe various cloud technologies such as Hadoop, Map Reduce and Virtual box and advancements.
Distributed System Lab (RCS-751 P)
1. Gain the knowledge of Unix/Linux operating systems and build concurrent client and server environment to understand the distributed properties and architecture.
2. Program the communication among processes at different hosts to facilitate distributed computing.
3. Understand, appreciate and apply distributed mutual algorithms in problem solving.
4. Apply principles of message passing programming in distributed system.
5. Understand and implement various design issues in distributed system.
Artificial Intelligence Lab (RCS752 P)
1. To understand the fundamental of Prolog Programming Language.
2. To implement simple programs like temperature conversion, monkey banana problem in Prolog Programming language.
3. implement medical diagnosis in Prolog Programming language and to understand the advantage and disadvantage of Green and Red Cut.
4. understand and implement Travelling Salesman Problem and 4 -Queen Problem in Prolog Programming Language.
5. To understand and implement Water Jug Problem in Prolog Programming Language.
Machine Learning (RCS-080 T)
1. To understand the need for machine learning for various problem solving.
2. To understand a wide variety of learning algorithms and how to evaluate models generated from data.
3. To understand the latest trends in machine learning.
4. To design appropriate machine learning algorithms and apply the algorithms to a real-world problem.
5. To optimize the models learned and report on the expected accuracy that can be achieved by applying the models.
Data Compression (RCS-087 T)
1. Understand the basic compression techniques and mathematical models to code the compression techniques.
2. Implement and analyze Huffman Coding for compression.
3. Understand the statistical and conceptual basis for lossy and lossless compression techniques.
4. Learn the basic concepts of scalar quantization.
5. Understand the process, types and advantages of vector quantization.


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