Koneru Lakshmaiah Education Foundation

(Category -1, Deemed to be University estd. u/s. 3 of the UGC Act, 1956)

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Department of Computer Science & Engineering

Program: B.Tech – AI & DS

Academic Year :2023-2024

Course Code	Course Name	CO#	Description of Course Outcome
22UC0020T	ANCIENT INDIAN COMPUTING: A HISTORICAL AND CULTURAL PERSPECTIVE (AIC)	CO1	Summarize the contributions of ancient Indian mathematics, linguistics, logic, and philosophy to computational thinking.
		CO2	Apply the philosophical implications of ancient Indian computing.
		CO3	Implement ethical ancient Indian computing and its relevance in contemporary society.
		CO4	Analyze the historical and cultural context of ancient Indian computing systems
23UC1101	INTEGRATED PROFESSIONAL ENGLISH(IPE)	CO1	Understanding the language Mechanics in Basic Grammar & Interactive Listening & Speaking
		CO2	Applying Integrated Reading skills & Techniques of Writing
23UC1202	ENGLISH PROFICIENCY (EP)	CO1	Understanding Language Mechanics in advanced Grammar and advanced Communicative Listening & Speaking
		CO2	Applying the advanced Reading techniques and Advanced Techniques of Writing
22UC2103	ESSENTIAL SKILLS FOR	CO1	Developing basic grammar Identify and organize sentence structures based on grammar.

	EMPLOYABILITY (ESE)	CO2	Develop effective interpersonal skills, cultivate a positive attitude, apply positive self-talk techniques, and use SWOC analysis to enhance employability.
		CO3	Develop drafting skills through Cloze Test, Passage completion, E-mail writing, Paragraph writing, Essay writing
		CO4	Develop effective communication skills through JAM and extempore, describing products and processes through JAM and extempore, demonstrating proper email and phone etiquette, and improving listening skills to enhance personal and professional relationships.
22UC2204	CORPORATE READINESS SKILLS (CRS)	CO1	Extend word power for developing effective speaking and writing skills
		CO2	Apply Interpersonal Skills in day-to-day life
		CO3	Differentiate and enhance critical and general reading skills
		CO4	Demonstrate necessary skills to be employable
22UC0010	UNIVERSAL HUMAN VALUES AND PROFESSIONAL ETHICS (UHV&PE)	CO1	Understand and analyse the essentials of human values and skills, self exploration, happiness and prosperity.
		CO2	Evaluate coexistence of the "I" with the body.
		CO3	Identify and associate the holistic perception of harmony at all levels of existence.
		CO4	Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

22UC1203	DESIGN THINKING AND INNOVATION (DTI)	CO1	Understand the importance of Design thinking mindset for identifying contextualized problems
		CO2	Analyze the problem statement by empathizing with user
		CO3	Develop ideation and test the prototypes made
		CO4	Explore the fundamentals of entrepreneurship skills for transforming the challenge into an opportunity
22UC0012	INNOVATION MANAGEMENT (IM)	CO1	Develop value proposition for the problem identified
		CO2	Build MVP for the solution developed
		CO3	Devise go to market strategy
		CO4	Create a Pitch-deck with funding strategy
22PH1005	ENGINEERING PHYSICS (EP)	CO1	Applying the concepts of basics of crystal structure to find out and to analyse the various structure of materials. To analyze the structure property relation through crystal imperfections.
		CO2	Apply the concepts of the deformation of materials in response to action of load to identify various Apply the concepts of the deformation of materials in response to action of load to identify various materials for specific engineering applications.
		CO3	Apply the concepts of various concepts of quantum mechanics to solve the problems related to the motion of electrons in microscopic level
		CO4	Apply the concepts and properties of light to know the laser mechanism in various materials and

			to know their specific applications in engineering and medicine.
		CO5	Apply the knowledge of physics to execute the related experiments and develop some inter disciplinary projects.
22PH1004	SOLID STATE PHYSICS (SSP)	CO1	Apply the spin and orbital motion of electrons in determining the magnetic properties of materials and identifies their role in the classification of soft & hard magnetic materials having specific engineering applications.
		CO2	Apply the role of molecular-level vibrations in determining thermal properties of material and micro, macro-level responses of materials subjected to load for identification of materials having specific engineering applications
		CO3	Apply the role of electronic energy band structures of solids in governing various electrical properties of conductors and semiconductors.
		CO4	Apply the role of electronic energy band structures of solids in governing various electrical properties of insulators and optical properties of materials
		CO5	Apply the knowledge on structure and properties of materials while executing related experiments.
22PH1006	QUANTUM PHYSICS FOR ENGINEERS (QPE)	CO1	Understand structure property relationship in crystals, band theory, semiconductors, and principles of lasers potential applications of lasers in various fields.

		CO2	Understand the need of quantum phenomenon to understand various phenomena like black body radiation, photoelectric effect, Compton effect, matter waves etc.
		CO3	Apply Schrödinger wave equation to solve simple quantum mechanical problems, interpret wave functions and probability densities, and understand the behaviour of particles in confined systems and under potential barriers.
		CO4	Understand various relativistic effects using special theory of relativity.
22CY1001	ENGINEERING CHEMISTRY (ECY)	CO1	Apply the operation of electrochemical systems to produce electric energy and storage devices.
		CO2	Use the fundamental aspects of electrochemistry and materials science relevant to corrosion phenomena.
		CO3	Examine water quality and apply appropriate purification technique for intended problem.
		CO4	Employ the fundamental principles and general properties of materials in various engineering applications.
		CO5	Analyse the data, develop skills in chemical analysis and their application in engineering.
23MT1001	LINEAR ALGEBRA AND CALCULUS FOR ENGINEERS (LACE)	CO1	Apply matrix algebra to the real-world problems - engineering, physical and biological sciences, finance and economics.
		CO2	Apply multivariate differential calculus to find extremum of

				functions and solve differential equations.
			CO3	Solve improper integrals using beta and gamma functions and evaluate double and triple integrals in 2-D and 3-D geometry.
			CO4	Make use of vector differentiation and integration, solve the real-world problems.
23MT1002	DISCRETE STRUCTURES (DIS)		CO1	Apply the knolodge of sets and function to the real world problems and computer problems to analize and draw ven diagrams
			CO2	Apply basic and computational techniques on discrete structures like relations, orders, functions & FSM, Lattices, and propositional
			CO3	Apply the knolodge of counting techniques, Recurrence Relations, Generating functions to solve the real world problems
			CO4	Apply graph theory to solving real world structures and their related applications
22MT2004	MATHEMATICAL PROGRAMMING (MP)		CO1	Apply various methods for finding the optimal solution of Linear Programming Problem
			CO2	Apply Integer and Fractional programming approaches for solving optimization problems
			CO3	To express a practical problem, such as an engineering analysis or design problem and to optimize a multivariate quadratic function subject to linear constraints on the variables.
			CO4	To apply and understand the search and optimization methodologies applicable to the resolution of multi-disciplinary

			decision problems, under a decision support framework.
22MT2005	PROBABILITY, STATISTICS & QUEUEING THEORY (PSQT)	CO1	To understand the importance of probabilistic concepts in a wide spectrum of problems arising in engineering applied science
		CO2	Identify the relationship between variables using corelation and regression techinques
		CO3	Explainthe role of Statistical tests of significance in solving real world engineering problems
		CO4	To formulate Stochastic process in terms of Markov chains and solve problems in queueing systems, and networks
22SC1101	COMPUTATIONAL THINKING FOR STRUCTURED DESIGN (CTSD)	CO1	Develop and apply logical building blocks to solve real world problems
		CO2	Apply computational thinking for designing solutions
		CO3	Develop and apply the CRUD operations on arrays
		CO4	Apply CRUD operations on Linear Data Structures
		CO5	Apply the structured programming paradigm with logic building skills on Basic and Linear Data Structures for solving real world problems
		CO6	Skill the students in such a way that students will be able to develop logic that help them to create programs as well as applications in C
22SC1202	DATA STRUCTURES (DS)	CO1	Understand various sorting algorithms and analyse the efficiency of the algorithms.
		CO2	Implement and evaluate Linear Data Structures and Demonstrate their applications.

		CO3	Implement and evaluate tree data structures and understand hashing techniques
		CO4	Understand graph data structures and apply graphs to solve problems
		CO5	Design, Develop and evaluate common practical applications for linear and nonlinear data structures.
		CO6	Skill the students in such a way that students will be able to develop logic that help them to create programs on both linear and non-linear data structures and its applications.
22ME1103	DESIGN TOOLS WORKSHOP (DTW)	CO1	Demonstrate proficiency in typing sentence , paragraph , report , presentations along spread sheets using office tools, LaTeX tools and PowerBI
		CO2	Build a static website and blog with using html along with Special features of HTML5, CSS and Javascript
		CO3	Develop a virtual environment with cospace and construct a marker based Augumented Reality and create a 3D terrain
		CO4	Utilising the softwares of Autodesk Fusion 360 and the same can be printed in 3D printer as physical prototype, Fundamentals of electrical circuit: Ohms law, KCL and KVL law
23EC1203	BASIC ELECTRICAL & ELECTRONIC CIRCUITS (BEEC)	CO1	Apply the Loop and Nodal methods to solve complex Electrical and electronic circuits.
		CO2	Apply the Study State Analysis techniques to study the response of R, L and C circuits.

		CO3	Examine the applications of Semiconductor Devices.
		CO4	Examine the applications of different Analog and Digital ICs.
22UC3108	PROBLEM SOLVING & REASONING SKILLS-1 (PSRS-1)	CO1	Apply the concepts of Linear Equations, concepts of Ratios, Averages, Partnership, Percentages and Interest to solve the problems related to Ages, Ratio & Proportion, Variation& Partnership, Percentages, Profit, Loss& Discounts, Simple & Compound Interest, Averages & Allegations or Mixtures.
		CO2	Apply the concepts of Co-primes, Divisibility rules, LCM & HCF concepts to solve problems in Numbers, Apply the concepts of Algebra to solve the problems based on Sets, Relations, Functions and Graphs, Surds & Indices, Logarithms, Quadratic Equations, Inequalities & Progressions.
		CO3	Apply Venn diagrams and other applicable diagrams to solve questions in Syllogism, Logical Venn Diagrams, Cubes & Dice. Understand the principles used in forming Number& letter series, Number, letter & word Analogy, Odd man out, Coding & Decoding.
		CO4	Understand the underlying assumptions in the arguments presented in the topics: Statements & conclusions, statements & Arguments (Critical Reasoning), statements & Assumptions, logical connectives, Binary logic.
22UC3209	PROBLEM SOLVING &	CO1	Apply the concepts of Unitary method in solving problems in Time

	REASONING SKILLS-2 (PSRS-2)		& Work, Chain Rule, Pipes & Cisterns. Apply the concept of Average speed and Relative speed to solve the problems related to Time, Speed &Distance, Trains, Boats & Streams, Races & games. Apply the concept of counting principles to solve the problems related to Permutations & Combinations and Probability.
		CO2	Apply the concepts of Perimeter, Area, Surface Area & Volume to solve the problems in 2D & 3D Geometry. Apply the concepts of Trigonometry to solve problems related to Heights & Distances. Apply the concepts of Lines, Angles, Triangles, Quadrilaterals & Polygons to solve the problems related to Geometry, Analyzing the data given in the Table, Bar Graph, Pie Chart and Line Graph to solve the problems in Data Interpretation. Data Sufficiency, Statistics, Crypt arithmetic.
		CO3	Apply the fundamental relationships and principles in solving questions in Blood Relations, Directions, Clocks, Calendars, Alphabet Test, Number, ranking & Time sequence test, Seating Arrangements, Mathematical Operations, Data Sufficiency, Nonverbal - series, analogy, classification.
		CO4	Apply the conditions mentioned in the question statement to solve questions in Input & Output, Assertion and Reason, dot situation. embedded figures, figure

				matrix, mirror and water images, paper cutting, paper folding pattern completion, rule detection, flowcharts, Puzzles, Sudoku puzzles
23EC1202	DIGITAL DESIGN & COMPUTER ARCHITECTURE (DDCA)	CO1	Build the combinational and programmable digital logic circuits using logic gates and optimization methods
		CO2	Construct the sequential and memory circuits using flip-flops
		CO3	Organize computer architecture and instructions sequence
		CO4	Model the Memory Architecture and I/O Organization modules
		CO5	Develop and analyze computer architecture modules using basic combinational, sequential and memory logics
23EC1011	FUNDAMENTALS OF IOT & SENSORS (FITS)	CO1	Able to apply the basic concepts of IoT and its implementation using the Development Hardware
		CO2	Able to apply the different sensors interfacing with Development Hardware
		CO3	Able to apply the different actuators interfacing with Development Hardware
		CO4	Able to analyze the IoT concept to solve real time insights
		CO5	Able to analyze the concept of IoT devices and system by interfacing with sensors, actuators and Cloud platform
23AD1202	OBJECT ORIENTED PROGRAMMING (OOP)	CO1	Apply the concepts of Basic Data types, Operators, Decision and Looping Control Statements, Strings
		CO2	Apply the concepts of Lists, Tuples, Dictionaries. Functions, Modules, Class, Object, OOPS principles.

		CO3	Apply Concepts of OOP principles, classes and objects, Call by value vs. Call by reference, recursion, and Nested classes
		CO4	Apply Concepts of Files, Interfaces, Packages, Threads
		CO5	Design, implement, and evaluate Python programs using basic data types, variables, expressions, conditional statements, loops, functions, built-in data structures, object-oriented programming concepts, Python libraries and modules, debugging techniques, and file I/O to solve programming problems.
		CO6	Apply object-oriented programming concepts to write programs and Analyses requirements and design to implement lab-based project with SDLC in a group of students