

| SREE NARAYANA GURU COLLEGE OF ENGINEERING AND TECHNOLOGY | | | | | |
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| DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING | | | | | |
| REGULATION | SEMESTER | UNIVERSITY CODE | SUBJECT NAME | CO CODE | COURSE OUTCOME |
| | S1&S2 | EST 102 | PROGRAMMING IN C | CO1 | Analyze a computational problem and develop an algorithm/flowchart to find its solution |
| | | | | CO2 | Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators. |
| | | | | CO3 | Write readable C programs with arrays, structure or union for storing the data to be processed |
| | | | | CO4 | Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem |
| | | | | CO5 | Write readable C programs which use pointers for array processing and parameter passing and Develop readable C programs with files for reading input and storing output |
| | | | | CO6 | Explain the principle of radio and cellular communication |
| | | ESL130 | ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP | CO4 | The student will be able to identify and test various electronic components |
| | | | | CO5 | The student will be able to draw circuit schematics with EDA tools |
| | | | | CO6 | The student will be able to assemble and test electronic circuits on boards |
| | | | | CO7 | The student will be able to work in a team with good interpersonal skills |
| | S3 | CST 201 | DATA STRUCTURES | CO1 | Design an algorithm for a computational task and calculate the time/space complexities of that algorithm (Cognitive Knowledge Level: Apply) |
| | | | | CO2 | Identify the suitable data structure (array or linked list) to represent a data item required to be processed to solve a given computational problem and write an algorithm to find the solution of the computational problem (Cognitive Knowledge Level: Apply) |
| | | | | CO3 | Write an algorithm to find the solution of a computational problem by selecting an appropriate data structure (binary tree/graph) to represent a data item to be processed (Cognitive Knowledge Level: Apply) |
| | | | | CO4 | Store a given dataset using an appropriate Hash Function to enable efficient access of data in the given set (Cognitive Knowledge Level: Apply) |
| | | | | CO5 | Select appropriate sorting algorithms to be used in specific circumstances (Cognitive Knowledge Level: Analyze) and Design and implement Data Structures for solving real world problems efficiently (Cognitive Knowledge Level: Apply) |
| | | CST 203 | LOGIC SYSTEM DESIGN | CO1 | Illustrate decimal, binary, octal, hexadecimal and BCD number systems, perform conversions among them and do the operations - complementation, addition, subtraction, multiplication and division on binary numbers (Cognitive Knowledge level: Understand) |
| | | | | CO2 | Simplify a given Boolean Function and design a combinational circuit to implement the simplified function using Digital Logic Gates (Cognitive Knowledge level: Apply) |
| | | | | CO3 | Design combinational circuits - Adders, Code Convertors, Decoders, Magnitude Comparators, Parity Generator/Checker and design the Programmable Logic Devices - ROM and PLA. (Cognitive Knowledge level: Apply) |
| | | | | CO4 | Design sequential circuits - Registers, Counters and Shift Registers. (Cognitive Knowledge level: Apply) |
| | | | | CO5 | Use algorithms to perform addition and subtraction on binary, BCD and floating point numbers (Cognitive Knowledge level: Understand) |
| | | CST 205 | OBJECT ORIENTED PROGRAMMING USING JAVA | CO1 | Write Java programs using the object oriented concepts - classes, objects, constructors, data hiding, inheritance and polymorphism (Cognitive Knowledge Level: Apply) |
| | | | | CO2 | Utilise datatypes, operators, control statements, built in packages & interfaces, Input/ Output Streams and Files in Java to develop programs (Cognitive Knowledge Level: Apply) |
| | | | | CO3 | Illustrate how robust programs can be written in Java using exception handling mechanism (Cognitive Knowledge Level: Understand) |
| | | | | CO4 | Write application programs in Java using multithreading and database connectivity (Cognitive Knowledge Level: Apply) |
| | | | | CO5 | Write Graphical User Interface based application programs by utilising event handling features and Swing in Java (Cognitive Knowledge Level: Apply) |
| | | CSL 201 | DATA STRUCTURES LAB | CO1 | Write a time/space efficient program using arrays/linked lists/trees/graphs to provide necessary functionalities meeting a given set of user requirements (Cognitive Knowledge Level: Analyse) |
| | | | | CO2 | Write a time/space efficient program to sort a list of records based on a given key in the record (Cognitive Knowledge Level: Apply) |
| | | | | CO3 | Examine a given Data Structure to determine its space complexity and time complexities of operations on it (Cognitive Knowledge Level: Apply) |
| | | | | CO4 | Design and implement an efficient data structure to represent given data (Cognitive Knowledge Level: Apply) |
| | | | | CO5 | Write a time/space efficient program to convert an arithmetic expression from one notation to another (Cognitive Knowledge Level: Apply) and linked lists to simulate Memory Allocation and Garbage Collection (Cognitive Knowledge Level: Apply) |
| | | | | CO6 | Realize how periodic functions are constituted by sinusoids |
| | | | | CO7 | Simulate random processes and understand their statistics |
| | | CSL 203 | OBJECT ORIENTED PROGRAMMING LAB (IN JAVA) | CO1 | Implement the Object Oriented concepts - constructors, inheritance, method overloading & overriding and polymorphism in Java (Cognitive Knowledge Level: Apply) |
| | | | | CO2 | Implement programs in Java which use datatypes, operators, control statements, built in packages & interfaces, Input/Output streams and Files (Cognitive Knowledge Level: Apply) |
| | | | | CO3 | Implement robust application programs in Java using exception handling (Cognitive Knowledge Level: Apply) |
| | | | | CO4 | Implement application programs in Java using multithreading and database connectivity (Cognitive Knowledge Level: Apply) |
| | | | | CO5 | Implement Graphical User Interface based application programs by utilizing event handling features and Swing in Java (Cognitive Knowledge Level: Apply) |
| | | CST 202 | COMPUTER ORGANISATION AND ARCHITECTURE | CO1 | Recognize and express the relevance of basic components, I/O organization and pipelining schemes in a digital computer (Cognitive knowledge: Understand) |
| | | | | CO2 | Explain the types of memory systems and mapping functions used in memory systems (Cognitive Knowledge Level: Understand) |
| | | | | CO3 | Demonstrate the control signals required for the execution of a given instruction (Cognitive Knowledge Level: Apply)) |
| | | | | CO4 | Illustrate the design of Arithmetic Logic Unit and explain the usage of registers in it (Cognitive Knowledge Level: Apply) |
| | | | | CO5 | Explain the implementation aspects of arithmetic algorithms in a digital computer (Cognitive Knowledge Level: Apply) and control logic for a given arithmetic problem (Cognitive Knowledge Level: Apply) |
| | | | | CO1 | Summarize and exemplify fundamental nature and characteristics of database systems (Cognitive Knowledge Level: Understand) |
| | | | | CO2 | Model real word scenarios given as informal descriptions, using Entity Relationship diagrams. (Cognitive Knowledge Level: Apply) |

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| 84 | CST 204 | DATABASE MANAGEMENT SYSTEMS | CO3 | Model and design solutions for efficiently representing and querying data using relational model (Cognitive Knowledge Level: Analyze) |
| | | | CO4 | Demonstrate the features of indexing and hashing in database applications (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Discuss and compare the aspects of Concurrency Control and Recovery in Database systems (Cognitive Knowledge Level: Apply) and explain various types of NoSQL databases (Cognitive Knowledge Level: Understand) |
| | CST 206 | OPERATING SYSTEMS | CO1 | Explain the relevance, structure and functions of Operating Systems in computing devices. (Cognitive knowledge: Understand) |
| | | | CO2 | Illustrate the concepts of process management and process scheduling mechanisms employed in Operating Systems. (Cognitive knowledge: Understand) |
| | | | CO3 | Explain process synchronization in Operating Systems and illustrate process synchronization mechanisms using Mutex Locks, Semaphores and Monitors (Cognitive knowledge: Understand) |
| | | | CO4 | Explain any one method for detection, prevention, avoidance and recovery for managing deadlocks in Operating Systems. (Cognitive knowledge: Understand) |
| | | | CO5 | Explain the memory management algorithms in Operating Systems. (Cognitive knowledge: Understand) and storage management in Operating Systems. (Cognitive knowledge: Understand) |
| | CSL204 | OPERATING SYSTEMS LAB | CO1 | Illustrate the use of systems calls in Operating Systems. (Cognitive knowledge: Understand) |
| | | | CO2 | Implement Process Creation and Inter Process Communication in Operating Systems. (Cognitive knowledge: Apply) |
| | | | CO3 | Implement First Come First Served, Shortest Job First, Round Robin and Prioritybased CPU Scheduling Algorithms. (Cognitive knowledge: Apply) |
| | | | CO4 | Illustrate the performance of First In First Out, Least Recently Used and Least Frequently Used Page Replacement Algorithms. (Cognitive knowledge: Apply) |
| | | | CO5 | Implement modules for Deadlock Detection and Deadlock Avoidance in Operating Systems. (Cognitive knowledge: Apply) and Implement modules for Storage Management and Disk Scheduling in Operating Systems. (Cognitive knowledge: Apply) |
| | ECL204 | MICROCONTROLLER LAB | CO1 | Write an Assembly language program/Embedded C program for performing data manipulation. |
| | | | CO2 | Develop ALP/Embedded C Programs to interface microcontroller with peripherals |
| | | | CO3 | Perform programming/interfacing experiments with IDE for modern microcontrollers |
| 85 | CST 301 | FORMAL LANGUAGES AND AUTOMATA THEORY | CO1 | Classify a given formal language into Regular, Context-Free, Context Sensitive, Recursive or Recursively Enumerable. [Cognitive knowledge level: Understand] |
| | | | CO2 | Explain a formal representation of a given regular language as a finite state automaton, regular grammar, regular expression and Myhill-Nerode relation. [Cognitive knowledge level: Understand] |
| | | | CO3 | Design a Pushdown Automaton and a Context-Free Grammar for a given context-free language. [Cognitive knowledge level : Apply] |
| | | | CO4 | Design Turing machines as language acceptors or transducers. [Cognitive knowledge level: Apply] |
| | | | CO5 | Explain the notion of decidability. [Cognitive knowledge level: Understand] |
| | CST 303 | COMPUTER NETWORKS | CO1 | Explain the features of computer networks, protocols, and network design models (Cognitive Knowledge: Understand) and describe the fundamental characteristics of the physical layer and identify the usage in network communication (Cognitive Knowledge: Apply) |
| | | | CO2 | Explain the design issues of data link layer, link layer protocols, bridges and switches (Cognitive Knowledge: Understand) |
| | | | CO3 | Illustrate wired LAN protocols (IEEE 802.3) and wireless LAN protocols (IEEE 802.11) (Cognitive Knowledge: Understand) |
| | | | CO4 | Select appropriate routing algorithms, congestion control techniques, and Quality of Service requirements for a network (Cognitive Knowledge: Apply) |
| | | | CO5 | Illustrate the functions and protocols of the network layer, transport layer, and application layer in inter-networking (Cognitive Knowledge: Understand) |
| | CST 305 | SYSTEM SOFTWARE | CO1 | Distinguish softwares into system and application software categories. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Identify standard and extended architectural features of machines. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Identify machine dependent features of system software (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Identify machine independent features of system software. (Cognitive Knowledge Level: Understand) |
| | | | CO5 | Design algorithms for system softwares and analyze the effect of data structures. (Cognitive Knowledge Level: Apply) and understand the features of device drivers and editing & debugging tools.(Cognitive Knowledge Level: Understand) |
| | CST 307 | MICROPROCESSORS AND MICROCONTROLLERS | CO1 | Illustrate the architecture, modes of operation and addressing modes of microprocessors (Cognitive knowledge: Understand) |
| | | | CO2 | Develop 8086 assembly language programs. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Demonstrate interrupts, its handling and programming in 8086. (Cognitive Knowledge Level: Apply)) |
| | | | CO4 | Illustrate how different peripherals (8255,8254,8257) and memory are interfaced with microprocessors. (Cognitive Knowledge Level: Understand) |
| | | | CO5 | Outline features of microcontrollers and develop low level programs. (Cognitive Knowledge Level: Understand) |
| | CST 309 | MANAGEMENT OF SOFTWARE SYSTEMS | CO1 | Demonstrate Traditional and Agile Software Development approaches (Cognitive Knowledge Level: Apply) |
| | | | CO2 | Prepare Software Requirement Specification and Software Design for a given problem. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Justify the significance of design patterns and licensing terms in software development, prepare testing, maintenance and DevOps strategies for a project. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Make use of software project management concepts while planning, estimation, scheduling, tracking and change management of a project, with a traditional/agile framework. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Utilize SQA practices, Process Improvement techniques and Technology advancements in cloud based software models and containers & microservices. (Cognitive Knowledge Level: Apply) |
| 86 | CSL 331 | SYSTEM SOFTWARE AND MICROPROCESSORS LAB | CO1 | Develop 8086 programs and execute it using a microprocessor kit. (Cognitive Knowledge Level: Apply) . |
| | | | CO2 | Develop 8086 programs and, debug and execute it using MASM assemblers (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Develop and execute programs to interface stepper motor, 8255, 8279 and digital to analog converters with 8086 trainer kit (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Implement and execute different scheduling and paging algorithms in OS (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Design and implement assemblers, Loaders and macroprocessors. (Cognitive Knowledge Level: Apply) |
| | | | CO6 | Implement FIR low pass filter. |
| | | | CO7 | Implement real time LTI systems with block convolution and FFT |

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| S6 | CSL 333 | DATABASE MANAGEMENT SYSTEMS LAB | CO1 | Design database schema for a given real world problem-domain using standard design and modeling approaches. (Cognitive Knowledge Level: Apply) |
| | | | CO2 | Construct queries using SQL for database creation, interaction, modification, and updation. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Design and implement triggers and cursors. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Implement procedures, functions, and control structures using PL/SQL. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Perform CRUD operations in NoSQL Databases. (Cognitive Knowledge Level: Apply) and database applications using front-end tools and back-end DBMS. (Cognitive Knowledge Level: Create) |
| | CST 302 | COMPILER DESIGN | CO1 | Explain the phases in compilation process (lexical analysis, syntax analysis, semantic analysis, intermediate code generation, code optimization and code generation) and model a lexical analyzer (Cognitive Knowledge Level: Apply) |
| | | | CO2 | Model language syntax using Context Free Grammar and develop parse tree representation using leftmost and rightmost derivations (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Compare different types of parsers (Bottom-up and Top-down) and construct parser for a given grammar (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Build Syntax Directed Translation for a context free grammar, compare various storage allocation strategies and classify intermediate representations (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Illustrate code optimization and code generation techniques in compilation (Cognitive Knowledge Level: Apply) |
| | CST 304 | COMPUTER GRAPHICS AND IMAGE PROCESSING | CO1 | Describe the working principles of graphics devices (Cognitive Knowledge level: Understand) |
| | | | CO2 | Illustrate line drawing, circle drawing and polygon filling algorithms (Cognitive Knowledge level: Apply) |
| | | | CO3 | Demonstrate geometric representations, transformations on 2D & 3D objects, clipping algorithms and projection algorithms (Cognitive Knowledge level: Apply) |
| | | | CO4 | Summarize visible surface detection methods (Cognitive Knowledge level: Understand) |
| | | | CO5 | Summarize the concepts of digital image representation, processing and demonstrate pixel relationships (Cognitive Knowledge level: Apply) and solve image enhancement and segmentation problems using spatial domain |
| | CST 306 | ALGORITHM ANALYSIS AND DESIGN | CO1 | Analyze any given algorithm and express its time and space complexities in asymptotic notations. (Cognitive Level: Apply) |
| | | | CO2 | Derive recurrence equations and solve it using Iteration, Recurrence Tree, Substitution and Master's Method to compute time complexity of algorithms. (Cognitive Level: Apply) |
| | | | CO3 | Illustrate Graph traversal algorithms & applications and Advanced Data structures like AVL trees and Disjoint set operations. (Cognitive Level: Apply) |
| | | | CO4 | Demonstrate Divide-and-conquer, Greedy Strategy, Dynamic programming, Branch-and Bound and Backtracking algorithm design techniques (Cognitive Level: Apply) |
| | | | CO5 | Classify a problem as computationally tractable or intractable, and discuss strategies to address intractability (Cognitive Level: Understand) and identify the suitable design strategy to solve a given problem. (Cognitive Level: Analyze) |
| | CST 308 | COMPREHENSIVE COURSE WORK | CO6 | Understand encoding and decoding of convolution and LDPC codes |
| | | | CO1 | Comprehend the concepts of discrete mathematical structures (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Comprehend the concepts and applications of data structures (Cognitive Knowledge Level: Understand) |
| | | | CO3 | Comprehend the concepts, functions and algorithms in Operating System (Cognitive Knowledge Level: Understand) |
| | | | CO4 | Comprehend the organization and architecture of computer systems (Cognitive Knowledge Level: Understand) |
| | CSL 332 | NETWORKING LAB | CO5 | Comprehend the fundamental principles of database design and manipulation (Cognitive Knowledge Level: Understand) and comprehend the concepts in formal languages and automata theory (Cognitive Knowledge Level: Understand) |
| | | | CO1 | Use network related commands and configuration files in Linux Operating System. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Develop network application programs and protocols. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Analyze network traffic using network monitoring tools. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Design and setup a network and configure different network protocols. (Cognitive Knowledge Level: Apply) |
| | CSD 334 | MINI PROJECT | CO5 | Develop simulation of fundamental network concepts using a network simulator. (Cognitive Knowledge Level: Apply) |
| | | | CO1 | Identify technically and economically feasible problems (Cognitive Knowledge Level: Apply) |
| | | | CO2 | Identify and survey the relevant literature for getting exposed to related solutions and get familiarized with software development processes (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Perform requirement analysis, identify design methodologies and develop adaptable & reusable solutions of minimal complexity by using modern tools & advanced programming techniques (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Prepare technical report and deliver presentation (Cognitive Knowledge Level: Apply) |
| | CST 372 | DATA AND COMPUTER COMMUNICATION | CO5 | Apply engineering and management principles to achieve the goal of the project (Cognitive Knowledge Level: Apply) |
| | | | CO1 | Identify the characteristics of signals for analog and digital transmissions (Cognitive knowledge: Apply) |
| | | | CO2 | Identify the issues in data transmission (Cognitive knowledge: Apply) |
| | | | CO3 | Select transmission media based on characteristics and propagation modes (Cognitive knowledge: Apply) |
| | | | CO4 | Choose appropriate signal encoding techniques for a given scenario (Cognitive knowledge: Apply) |
| | CST401 | ARTIFICIAL INTELLIGENCE | CO5 | Illustrate multiplexing and spread spectrum technologies (Cognitive knowledge: Apply) and error detection, correction and switching techniques in data communication (Cognitive knowledge: Apply) |
| | | | CO1 | Explain the fundamental concepts of intelligent systems and their architecture. (Cognitive Knowledge Level: Understanding) |
| | | | CO2 | Illustrate uninformed and informed search techniques for problem solving in intelligent systems. (Cognitive Knowledge Level: Understanding) |
| | | | CO3 | Solve Constraint Satisfaction Problems using search techniques. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Represent AI domain knowledge using logic systems and use inference techniques for reasoning in intelligent systems. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Illustrate different types of learning techniques used in intelligent systems (Cognitive Knowledge Level: Understand) |
| | | | CO1 | Explain the various cloud computing models and services. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Demonstrate the significance of implementing virtualization techniques. (Cognitive Knowledge Level: Understand) |

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| S7 | CST423 | CLOUD COMPUTING | CO3 | Explain different cloud enabling technologies and compare private cloud platforms (Cognitive Knowledge Level: Understand) |
| | | | CO4 | Apply appropriate cloud programming methods to solve big data problems. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Describe the need for security mechanisms in cloud (Cognitive Knowledge Level: Understand) and compare the different popular cloud computing platforms (Cognitive Knowledge Level: Understand) |
| | CST433 | SECURITY IN COMPUTING | CO1 | Identify the security services provided against different types of security attacks. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Illustrate classical encryption techniques for information hiding. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Illustrate symmetric/asymmetric key cryptosystems for secure communication. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Explain message integrity and authentication methods in a secure communication scenario. (Cognitive Knowledge Level: Understand) |
| | | | CO5 | Interpret public/secret key distribution techniques for secure communication. (Cognitive Knowledge Level: Understand)and identify the effects of intruders, malicious software and distributed denial of service attacks on system security. (Cognitive Knowledge Level: Understand). |
| | CSL411 | COMPILER LAB | CO1 | Implement lexical analyzer using the tool LEX. (Cognitive Knowledge Level: Apply) |
| | | | CO2 | Implement Syntax analyzer using the tool YACC. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Design NFA and DFA for a problem and write programs to perform operations on it. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Design and Implement Top-Down parsers. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Design and Implement Bottom-Up parsers. (Cognitive Knowledge Level: Apply) and implement intermediate code for expressions. (Cognitive Knowledge Level: Apply) |
| | CSQ413 | SEMINAR | CO1 | Identify academic documents from the literature which are related to her/his areas of interest (Cognitive knowledge level: Apply). |
| | | | CO2 | Read and apprehend an academic document from the literature which is related to her/ his areas of interest (Cognitive knowledge level: Analyze). |
| | | | CO3 | Prepare a presentation about an academic document (Cognitive knowledge level: Create). |
| | | | CO4 | Give a presentation about an academic document (Cognitive knowledge level: Apply). |
| | | | CO5 | Prepare a technical report (Cognitive knowledge level:Create). |
| | ECD 415 | PROJECT PHASE 1 | CO1 | Model and solve real world problems by applying knowledge across domains(Cognitive knowledge level: Apply). |
| | | | CO2 | Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply). |
| | | | CO3 | Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply). |
| | | | CO4 | Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply). |
| | | | CO5 | Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze) and organize and communicate technical and scientific findings effectively in written and oral forms (Co |
| S8 | | | CO3 | Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply). |
| | | | CO4 | Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply). |
| | | | CO5 | Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze). |
| | | | CO6 | Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply) |
| | CST402 | DISTRIBUTED COMPUTING | CO1 | Summarize various aspects of distributed computation model and logical time. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Illustrate election algorithm, global snapshot algorithm and termination detection algorithm. (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Compare token based, non-token based and quorum based mutual exclusion algorithms. (Cognitive Knowledge Level: Understand) |
| | | | CO4 | Recognize the significance of deadlock detection and shared memory in distributed systems. (Cognitive Knowledge Level: Understand) |
| | | | CO5 | Explain the concepts of failure recovery and consensus. (Cognitive Knowledge Level: Understand) and illustrate distributed file system architectures. (Cognitive Knowledge Level: Understand) |
| | CST 424 | PROGRAMMING PARADIGMS | CO1 | Explain the criteria for evaluating programming languages and compare Imperative, Functional and Logic programming languages (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Illustrate the characteristics of data types and variables (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Comprehend how control flow structures and subprograms help in developing the structure of a program to solve a computational problem (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Explain the characteristics of Object-Oriented Programming Languages (Cognitive Knowledge Level: Understand) |
| | | | CO5 | Compare concurrency constructs in different programming languages (Cognitive Knowledge Level: Understand) |
| | CST434 | NETWORK SECURITY PROTOCOLS | CO1 | Explain authentication protocols, X.509 authentication service and Public Key Infrastructure (PKI).(Cognitive Knowledge Level: Understand) |
| | | | CO2 | Identify the security mechanisms in E mail security services. (Cognitive Knowledge Level: Understand) |
| | | | CO3 | Summarize the network and transport layer security services provided in a secure communication scenario. (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Describe real time communication security and application layer security protocols. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Explain the concepts of firewalls and wireless network security. (Cognitive Knowledge Level: Understand) |
| | CST466 | DATA MINING | CO1 | Employ the key process of data mining and data warehousing concepts in application domains. (Cognitive Knowledge Level: Understand) |
| | | | CO2 | Make use of appropriate preprocessing techniques to convert raw data into suitable format for practical data mining tasks (Cognitive Knowledge Level: Apply) |
| | | | CO3 | Illustrate the use of classification and clustering algorithms in various application domains (Cognitive Knowledge Level: Apply) |
| | | | CO4 | Comprehend the use of association rule mining techniques. (Cognitive Knowledge Level: Apply) |
| | | | CO5 | Explain advanced data mining concepts and their applications in emerging domains (Cognitive Knowledge Level: Understand) |
| | | | CO1 | Explain the various mobile computing applications, services, design considerations and architectures (Cognitive knowledge: Understand) |

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| | CST476 | MOBILE COMPUTING | CO2 | Describe the various technology trends for next generation cellular wireless networks and use the spreading concept on data transmission (Cognitive knowledge: Apply) |
| | | | CO3 | Summarize the architecture of various wireless LAN technologies (Cognitive knowledge: Understand) |
| | | | CO4 | Identify the functionalities of mobile network layer and transport layer (Cognitive knowledge: Understand) |
| | | | CO5 | Explain the features of Wireless Application Protocol (Cognitive knowledge: Understand) and interpret the security issues in mobile computing and next generation technologies (Cognitive knowledge: Understand) |
| | | | CO6 | Organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply). |
| | CST448 | INTERNET OF THINGS | CO1 | Outline the fundamentals of IoT and its underlying physical and logical architecture(Cognitive Knowledge Level: Understand) |
| | | | CO2 | Explain the hardware architectures for IoT (Cognitive Knowledge Level : Understand) |
| | | | CO3 | Outline the Network architectures for IoT(Cognitive Knowledge Level : Understand) |
| | | | CO4 | Implement data analytics on the IoT platforms (Cognitive Knowledge Level : Apply) |
| | | | CO5 | Appreciate the security considerations in IoT (Cognitive Knowledge Level : Understand) and implement IoT applications using the available hardware and software. |
| | ECD 416 | PROJECT PHASE II | CO1 | Model and solve real world problems by applying knowledge across domains (Cognitive knowledge level: Apply). |
| | | | CO2 | Develop products, processes or technologies for sustainable and socially relevant applications (Cognitive knowledge level: Apply). |
| | | | CO3 | Function effectively as an individual and as a leader in diverse teams and to comprehend and execute designated tasks (Cognitive knowledge level: Apply). |
| | | | CO4 | Plan and execute tasks utilizing available resources within timelines, following ethical and professional norms (Cognitive knowledge level: Apply). |
| | | | CO5 | Identify technology/research gaps and propose innovative/creative solutions (Cognitive knowledge level: Analyze) and organize and communicate technical and scientific findings effectively in written and oral forms (Cognitive knowledge level: Apply). |