# SANTHIRAM ENGINEERING COLLEGE:: NANDYAL

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NH-40, Nandyal – 518501 :: Kurnool Dist. A.P.

**DEPARTMENT : COMPUTER SCIENCE & ENGINEERING**

**COURSE OUTCOMES** **REGULATION : R15**

| Year/Sem. | S.No. | Subject Name | SUB CODE | COURSE OUT COMES | |
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| | 1 | BASIC ELECTRICAL & ELECTRONICS ENGINEERING | 15A99301 | CO1 | Understand basic concepts of the currents and voltage by using theorems and two-port networks. |
| | | | | CO2 | Analyze the performance of AC & DC Machines. |
| | | | | CO3 | Analyze the operating principles of major electronic devices, its characteristics and Explain different rectifiers and filters used in power supply section. |
| | | | | CO4 | Explain and analyze basic transistor amplifier circuits using BJT and FET. |
| | | | | CO5 | Design and analyze the application of BJT. |
| | 2 | MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS | 15A52301 | CO1 | To Remember the concept of Economics and its relation with other subjects and understand the demand, its forecasting methods and measurement of elasticity of demand. |
| | | | | CO2 | Understand the theory of production, laws of production, applying the methodology of cost analysis and breakeven point. |
| | | | | CO3 | Analyze the types of markets, perfect and imperfect competitions and Evaluating the forms of business organizations and LPG. |
| | | | | CO4 | Analyze financial accounting importance, preparation and Evaluate the Ratios with the supporting of Ratio analysis. |
| | | | | CO5 | Evaluate the capitalization, sources and measures of capital and creating the capital budgeting with different types. |
| | | | | CO1 | List &Understandnumerical and character representations in digital logic including ASCII and error detecting and correcting codes and Evaluate and simplify logical functions using Boolean algebra. |

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| II YEAR I-SEM | 3 | DIGITAL LOGIC DESIGN | 15A04402 | CO2 | Explain about the Gate–Level Minimization Techniques. |
| | | | | CO3 | Analyze and design modular combinatorial logic circuits containing decoders, multiplexers, demultiplexersand adders. |
| | | | | CO4 | Analyze and design of sequential circuits by applying the functionality of flip-flops. |
| | | | | CO5 | Discussabout Memory and Programmable Logic & Digital Logic Circuits |
| | 4 | DISCRETE MATHEMATICS | 15A05302 | CO1 | Write an argument using logical notation and determine if the argument is or is not valid. able to express a logic sentence in terms of predicates, quantifiers, and logical connectives |
| | | | | CO2 | Demonstrate an understanding of relations and functions and be able to determine their properties. Determine when a function is 1-1 and "onto" |
| | | | | CO3 | Able to apply algebraic structures such as group theory and group codes to solve the real world problems. able to evaluate Boolean functions and simplify expressions using the properties of Boolean algebra |
| | | | | CO4 | Demonstrate different traversal methods for trees and graphs. Model problems in Computer Science using graphs and trees.. |
| | | | | CO5 | Apply counting principles to determine probabilities |
| | 5 | MATHEMATICS-III | 15A54301 | CO1 | Understand the existenc of linear equations with rank knowledge |
| | | | | CO2 | able to apply numerical techniques to solve algebraic and transcendental equations |
| | | | | CO3 | able to shoot the solutions by Interpolation techniques |
| | | | | CO4 | able to understand how to fit a curve for the set of tabulated values |
| | | | | CO5 | able to find solutions Laplace equations using Finite difference approximation |
| | | | | CO1 | Explain the features of database management systems and Relational database. Demonstrate the basic elements of a relational database management system |

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| | 6 | DATABASE MANAGEMENT SYSTEMS | 15A05301 | CO2 | Ability to identify the data models for relevant problems. |
| | | | | CO3 | Ability to design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data. |
| | | | | CO4 | Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database. |
| | | | | CO5 | Apply normalization for the development of application software & Build The indexing mechanisms for efficient retrieval of information from a database. |
| | 7 | DATABASE MANAGEMENT SYSTEMS LABORATORY | 15A05303 | CO1 | Understand the appropriate DBMS software installation and Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS |
| | | | | CO2 | use an SQL interface of a multi-user relational DBMS package to create, secure, populate, maintain, and query a database. |
| | | | | CO3 | Formulate query, using SQL, solutions to a broad range of query and data update problems. |
| | 8 | BASIC ELECTRICAL & ELECTRONICS LABORATORY | 15A99302 | CO1 | Understand and compare basic electric circuit theorems with actual working circuits. |
| | | | | CO2 | Apply and Conduct experiments to obtain the load characteristics of D.C. Generators |
| | | | | CO3 | Apply and Conduct tests on D.C. motors for predetermination of efficiency |
| | | | | CO4 | Understand electrical model for various semiconductor devices. |
| | | | | CO5 | Create the practical applications of the semiconductor devices. |
| | 1 | COMPUTER NETWORKS | 15A05502 | CO1 | Able to discuss standards, administration and Network models. |
| | | | | CO2 | Able to calculate the properties of physical media and Error detection and Correction methods during data transmission. |
| | | | | CO3 | Able to calculate the performance at Transport Layer protocols. |

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| | | | CO4 | Able to implement Application Layer protocols such as HTTP, DNS and SMTP. |
| | | | CO5 | Able to examine the various Routing protocols, Internet Control protocols and Quality of Service. |
| 2 | OBJECT ORIENTED ANALYSIS AND DESIGN | 15A05503 | CO1 | Illustrate the fundamentals of Object Modeling |
| | | | CO2 | Explain about Classes, Objects and Relationships |
| | | | CO3 | Construct object models for complex system. |
| | | | CO4 | Construct class and Object diagrams using conceptual model of UML. |
| | | | CO5 | Design Package, Composite structure, component and Deployment diagrams using Structural modeling |
| | | | CO6 | Design Use case, Interaction, Communication and Timing diagrams using Behavioral modeling |
| 3 | OPERATING SYSTEMS | 15A05501 | CO1 | Understand the difference between different types of modern operating systems, virtual machines and their structure of implementation and applications |
| | | | CO2 | Understand the difference between process & thread, issues of scheduling of user-level processes/ threads and their issues Produce customized algorithmic solutions for given synchronization problems |
| | | | CO3 | Identify the rationale behind various memory management techniques along with issues and challenges of main memory, virtual memory and file system |
| | | | CO4 | Infer the performance of page replacement algorithms in various scenarios |
| | | | CO5 | Understand the concepts of deadlock in operating systems and how they can be managed / avoided and implement them in multiprogramming system. |
| | PRINCIPLES OF PROGRAMMING LANGUAGES | | CO1 | Discuss software development environment, design models for programminglanguages and their syntax and semantics.. |
| | | | CO2 | Discuss structure of data types and implementation models |

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| III YEAR I SEM | 4 | | 15A05504 | CO3 | Explain language constructs, pattern matching, Non determinism andbacktracking, Event driven computations, concurrent computations Describe Software Design methods for modularity and generic |
| | | | | CO4 | Discuss the basic concepts of Object-oriented Programming languages |
| | | | | CO5 | Discuss the functional, logic and rule based languages. |
| | 5 | R PROGRAMMING | 15A05507 | CO1 | To understand the fundamentals of 'R' programming and working with Objects |
| | | | | CO2 | Describe the data statistical test and tabulation and Analyze simple hypothesis testing |
| | | | | CO3 | Design graphical analysis and formulate Notation And Complex Statistics |
| | | | | CO4 | Describe the analysis of variance and linear regression. |
| | | | | CO5 | Design the adding elements to existing plots and Describe writing your own scripts |
| | 6 | SOFTWARE TESTING | 15A05505 | CO1 | To understand the basic Concepts & Purpose of testing. |
| | | | | CO2 | Classify two different types of testing and applying those methods to evaluate the testing. |
| | | | | CO3 | Extend the type of testing and applying those methods to evaluate the testing. |
| | | | | CO4 | Classify two different types of testing and applying those methods to analyze & evaluate the testing. |
| | | | | CO5 | Relating the previous methods to perform testing and applying those methods to evaluate the testing. |
| | | SOCIAL VALUES AND | | CO1 | Able recall family,and human values and compare his family with others and analyse the |
| | | | | CO2 | Classify the fundamental Rights and fundamental duties of citizen Influence the factors affecting youth crime.. |

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| | 7 | VALUES AND ETHICS (AUDIT COURSE) | 15A99501 | CO3 | Explain the Environmental issues and Justify the objectives of civil defense. |
| | | | | CO4 | Demonstrate Gender inequality, Domestic violence and Appraise the government schemes ,laws. |
| | | | | CO5 | Importance the games ,sports,and benefits of exercise, Recommend the yoga asanas ,mudras and pranayama . |
| | 8 | OBJECT ORIENTED ANALYSIS & DESIGN AND SOFTWARE TESTING LAB | 15A05509 | CO1 | Demonstrate fundamentals of UML Tools. |
| | | | | CO2 | Develop Structural diagrams for modeling complex systems |
| | | | | CO3 | Develop Behavioral diagrams for modeling complex systems. |
| | | | | CO4 | Execute the working of control statements in C programming. |
| | | | | CO5 | Describe SRS and test cases for Banking applications and Library management system reporting bugs. |
| | 9 | OPERATING SYSTEMS LABORATORY | 15A05510 | CO1 | Simulate the following CPU scheduling algorithms a) Round Robin b) SJF c) FCFS d) Priority |
| | | | | CO2 | Simulate all file allocation strategies a) Sequential b) Indexed c) Linked |
| | | | | CO3 | Simulate MVT and MFT |
| | | | | CO4 | Simulate all File Organization Techniques a) Single level directory b) Two level c) Hierarchical d) DAG |
| | | | | CO5 | Simulate Bankers Algorithm for Dead Lock Avoidance |
| | | | | CO1 | To define the use of Computer graphics and various technologies involved in it |
| | | | | CO2 | Able to construct 2D transformations, viewing techniques on a given area. |

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| 1 | COMPUTER GRAPHICS | 15A05705 | CO3 | Analyzethe concept of 3D object surfaces, variouscurve representations on a system. |
| | | | CO4 | To apply 3D geometric transformations, clippings on a given surface. |
| | | | CO5 | Able to solve the various visible surface detection methods and their implementation |
| 2 | INFORMATION SECURITY | 151A05702 | CO1 | Describe principles and practices of cryptography |
| | | | CO2 | Apply the number theory in public key cryptography |
| | | | CO3 | Apply hash functions, message authentication codes and digital signature schemes in user authentication and security techniques to personal computer |
| | | | CO4 | Analyze remote user authentication using symmetric encryption and asymmetric encryption |
| | | | CO5 | Analyze symmetric and asymmetric cryptographic techniques |
| 3 | MOBILE APPLICATION DEVELOPMENT | 15A05703 | CO1 | To understand the fundamentals of android operating systems and its components |
| | | | CO2 | Illustrate the various components, layouts and creating views in android applications |
| | | | CO3 | Design and Analyze building blocks for android application design and Utilizing Resources |
| | | | CO4 | Build android applications with widgets and Debugging application |
| | | | CO5 | Illustrate Menus and Create data sharing with different applications and sending SMS. |
| | | | CO1 | To understand the concepts of management its functions, theories of Motivation, Leadership and organization Structures |
| | | | CO2 | To know about plant location and layout, inventory Management, PLC, channels and ASPM strategies. |

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| IV YEAR I SEM | 4 | MANAGEMENT SCIENCE | 15A52601 | CO3 | To tell about the HRM concepts like HRP, Performance appraisal, Employee grievances, Recruitment strategies, Training and Development. |
| | | | | CO4 | To know about the Corporate Planning process, Environmental scanning, SWOT analysis, Program Evaluation, Review Technique and Critical Path method. |
| | | | | CO5 | To describe the contemporary management practices like BPR, BPO, Balance score card, six-sigma, Total Quality Management. |
| | 5 | SOFTWARE PROJECT MANAGEMENT | 15A05704 | CO1 | Demonstrate conventional models and software cost estimation. |
| | | | | CO2 | Differentiate the principles of conventional software engineering with modern software management and software economics. |
| | | | | CO3 | Explain project organization, artifacts, of software process and workflow of software project management. |
| | | | | CO4 | Apply metrics for software project control, process instrumentation future software project management. |
| | | | | CO5 | Compare the software life cycle phases in software project management. |
| | 6 | GRID AND CLOUD COMPUTING | 15A05701 | CO1 | Understand the basic concepts of traditional computing technologies and modern technologies. |
| | | | | CO2 | Understand and elaborate the open standard services for Grid Architecture. Understand and how data intensive grid service models works. |
| | | | | CO3 | Understand the basic concepts of virtualization and apply in grid and cloud computing environment and it gives optimum resource utilization. |
| | | | | CO4 | Understand the Grid and Cloud Tool Kit to program on it and also understand Hadoop concept and map reduce functions. |
| | | | | CO5 | Understand and apply the security model in Grid and Cloud Environment. The cloud supports SaaS, PaaS and IaaS. |
| | | MOBILE APPLICATION DEVELOPMENT LABORATORY | | CO1 | Illustrate Download, Install and Configure Eclipse and SDK Platform for creating Android Applications |
| | | | | CO2 | Build a basic Android Applications using Activity class. |

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| | 7 | LABORATORY | 15A05711 | CO3 | Develop and Test the Android Application by using Text Edit control. |
| | | | | CO4 | Create an Android Application to choose options, play the Audio and Video clips. |
| | | | | CO5 | Design the Android Application for Menus and Action Bar and display Drop-Down List Action Bar |
| | 8 | GRID AND CLOUD COMPUTING LABORATORY | 15A05710 | CO1 | Understand and use the GridSim in grid computing environment. |
| | | | | CO2 | Understand the basic concept of Globus Toolkit and apply grid computing programs. |
| | | | | CO3 | Understand the SaaS and use in cloud computing programs. |
| | | | | CO4 | Understand how PaaS work and apply to programs. |
| | 1 | FORMAL LANGUAGES & AUTOMATA THEORY | 15A05404 | CO1 | Prove properties of languages, grammars and automata with formal mathematical methods. Construct Finite Automata and its types |
| | | | | CO2 | Construct automata to recognize whether the given language is accepted or rejected. |
| | | | | CO3 | Build the given grammar into Chomsky normal form and griebach normal forms. |
| | | | | CO4 | Analyze whether the given grammar is in well structured or not using context-free grammar |
| | | | | CO5 | Design Push Down Automata for a given language. |
| | 2 | COMPUTER ORGANIZATION | 15A05402 | CO1 | Able to illustrate fundamentals of computer components. Able to explain the design issues of machine instructions, input output systems, memory systems and processor systems |
| | | | | CO2 | Able to calculate arithmetic operations and logical operations of a Computer |
| | | | | CO3 | Able to calculate performance of primary and secondary storage systems |

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| | | | | CO4 | Able to illustrate design issues of parallel systems |
| | | | | CO5 | Able to calculate performance of Parallel systems |
| | 3 | PROBABILITY AND STATISTICS | 15A54401 | CO1 | Understand and apply the basic axioms of Probability |
| | | | | CO2 | ables and rules the moments of discrete & Continuous random variables |
| | | | | CO3 | able to analyze the problem of engineering and industry using testing of hypothesis techniques |
| | | | | CO4 | Apply the knowledge of SQC in industry and engineering related areas |
| | | | | CO5 | Able to understand the queuing techniques |
| | 4 | SOFTWARE ENGINEERING | 15A05401 | CO1 | Define and develop a software project from requirement gathering to implementation |
| | | | | CO2 | Ability to code and test the software |
| | | | | CO3 | Understanding and analyzing and applying the Design concepts with neat details |
| | | | | CO4 | Analyzing and applying and create a interfaces and designing webApps |
| | | | | CO5 | Analyzing and evaluating components and software's |
| II YEAR II SEM | 5 | MICROPROCESSORS & INTERFACING | 15A04407 | CO1 | Understand the architecture of 8085 and 8086 microprocessor |
| | | | | CO2 | Explains addressing modes, instructions of 8086 and programming in 8086 |
| | | | | CO3 | Explains about Interrupts ,Memory and I/O interfacing |

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| | | | CO4 | Explains features and interfacing of programmable devices |
| | | | CO5 | Understand and analyze the architecture ,instructions, registers ,instructions and interfacing devices with microcontroller 8051 |
| 6 | MICROPROCESSORS &INTERFACING LABORATORY | 15A04408 | CO1 | Introduction to MASM Programming |
| | | | CO2 | Simulate Arithmetic operations |
| | | | CO3 | Simulate Logic operations |
| | | | CO4 | Simulate string operation |
| | | | CO5 | Simulate 8259 – Interrupt Controller Interfacing with 8086 |
| 7 | OBECT ORIENTED PROGRAMMING USING JAVA | 15A05403 | CO1 | Able to understand the use of OOPs concepts. |
| | | | CO2 | Able to solve real world problems using OOP techniques. |
| | | | CO3 | Able to understand the use of abstraction. Able to understand the use of Packages and Interface in java. |
| | | | CO4 | Able to develop and understand exception handling, multithreaded applications with synchronization |
| | | | CO5 | Able to understand the use of Collection Framework. Able to design GUI based applications and develop applets for web applications. and receive clear instructions |
| 8 | JAVA PROGRAMMING LABORATORY | 15A05405 | CO1 | Ability to solve problems using object oriented approach and implement them using Java |
| | | | CO2 | Ability to write Efficient programs with multitasking ability and handle exceptions. |
| | | | CO3 | Create user friendly interface |

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| | | | | CO4 | Creating and Understanding the usage of user defined packages |
| | | | | CO5 | Ability to create GUI based applications using AWT and Swings |
| | 1 | COMPILER DESIGN | 15A05601 | CO1 | To understand the basic Concepts of phases of compiler and its process (LEX & YACC Tools). |
| | | | | CO2 | Design and Analyze the parsers and learn to how different parsers are constructed and evaluated for the requirements of application fields. |
| | | | | CO3 | Construct the intermediate code representations and generation. |
| | | | | CO4 | Understand the runtime storage organization and symbol table organization |
| | | | | CO5 | Convert source code for a novel language into machine code for a novel computer |
| | 2 | DESIGN PATTERNS | 15A05603 | CO1 | To understand the fundamentals of design patterns and organize the catalog of design patterns. |
| | | | | CO2 | Implement behavioral patterns to design a document editor supporting multiple look &and feel standards. |
| | | | | CO3 | Explain the structural patterns included by adapter, bridge, composite, decorator, façade, flyweight and proxy |
| | | | | CO4 | Examine the behavioral patterns to recognize the chain of responsibility, command, interpreter and observer |
| | | | | CO5 | Choose behavioral patterns with state, strategy and template method |
| | 3 | DATA WAREHOUSE AND MINING | 15A05602 | CO1 | Able to describe the basic concepts of data warehouse, data mining systems, and application oriented database. |
| | | | | CO2 | Able to apply pre-processing techniques on data |
| | | | | CO3 | Able to implement data warehouse and OLAP techniques for data mining. |

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| | | | | CO4 | Able to apply association methods for data mining. |
| | | | | CO5 | Able to apply classification methods for data mining. |
| III YEAR II SEM | 4 | DESIGN AND ANALYSIS OF ALGORITHMS | 15A05604 | CO1 | Analyze the time and space complexity of a given algorithm and apply Divide-and-Conquer design approach to solve the problems |
| | | | | CO2 | Apply Greedy method and Dynamic Programming Techniques to solve the optimization problems. |
| | | | | CO3 | Able to apply Back tracking technique for solving constraint satisfaction problems. |
| | | | | CO4 | Able to understand basics of tree, graphs NP complete problem. |
| | | | | CO5 | Apply Branch and Bound design technique to solve combinatorial optimization problems |
| | 5 | WEB AND INTERNET TECHNOLOGIES | 15A05605 | CO1 | Ability to create dynamic and interactive web sites |
| | | | | CO2 | Gain knowledge of client side scripting using javasript and DHTML |
| | | | | CO3 | To create dynamic and interactive web pages with PHP |
| | | | | CO4 | To Demonstrate understanding of XML and analyze how to parse and use XML data |
| | | | | CO5 | To design rich client presentation using AJAX and understand web services concept |
| | 6 | LINUX ENVIRONMENT SYSTEM | 15A05607 | CO1 | Students will be able to understand the basic commands of Linux operating system and can write shell scripts |
| | | | | CO2 | Students will be able to create file systems and directories and operate them |
| | | | | CO3 | Students will be able to create processes background and fore ground etc..by fork() system calls |

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| | | | | CO4 | Students will be create shared memory segments, pipes ,message queues and can exercise inter process communication |
| | | | | CO5 | Students can able to perform disk partition and able to apply core system services |
| | 7 | DATA WAREHOUSING & MINING LABORATORY | 15A05610 | CO1 | Able to demonstrate WEKA Tool. Able to Identify the attribute types of datasets using WEKA. |
| | | | | CO2 | Able to explore association rule mining on data sets. |
| | | | | CO3 | Able to explore Classification on data sets. |
| | | | | CO4 | Able to apply Clustering techniques on data sets |
| | | | | CO5 | Able to interpret Regression models on Data sets. |
| | 8 | WEB AND INTERNET TECHNOLOGIES LABORATORY | 15A05609 | CO1 | To create basic web page using HTML5 and its Elements |
| | | | | CO2 | To Design and build a Web page using CSS3 embedded with HTML5 |
| | | | | CO3 | To interpret and Develop interactive web page at client side using Javascript |
| | | | | CO4 | To Build a Web page with Server Programming using Java Servlet and JSP |
| | | | | CO5 | To Develop a PHP program and apply with the Database to server programming |
| | | | | CO6 | Illustrate and construct XML DTD and its Schema |
| | 1 | ENABLING TECHNOLOGIES FOR DATA SCIENCE ANALYTICS: IOT | 15A05805 | CO1 | Understand the IoT concepts and Applications. |
| | | | | CO2 | Understand and analyze IoT system Management. |
| | | | | CO3 | Design and analysis of IoT system and its applications. |
| | | | | CO4 | Understand Hadoop concept and IEEE 802 committee family of protocols. |
| | | | | CO5 | Understand, analyze and design of Zigbee. |
| | | | | CO1 | To understand the basic Concepts of Wireless Sensor Networks. |

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| IV YEAR II SEM | 2 | MOBILE COMPUTING | 15A05802 | CO2 | Design and Analyze Wired and wireless sensor networks (Ad-Hoc Wireless Networks ) and learn to how the MAC Protocols are suitable for wireless networks by assessing the requirements of application fields. |
| | | | | CO3 | Demonstrate basic skills for Routing Protocols and Transport Layer and Security Protocols. |
| | | | | CO4 | Understand the fundamentals of Quality of service and energy management in wireless sensor networks. |
| | | | | CO5 | Analyze security, energy efficiency, mobility, scalability, and their unique characteristics in wireless networks |
| | 3 | SEMINAR | 15A05808 | CO1 | The students will be able to recall existing technologies in the area of computer science |
| | | | | CO2 | The students will be able to describe, compare and evaluate different technologies |
| | | | | CO3 | The students will be able to decide the area of interest |
| | | | | CO4 | The students will be able to develop their communication skills |
| | | | | CO5 | The students will be able to write technical reports. |
| | 4 | Project | 15A05809 | CO1 | Graduates will be able to identify and define problems in the area of Computer science |
| | | | | CO2 | Graduates will be able to explain and illustrate their practical skills needed to understand and |
| | | | | CO3 | Graduates will get a chance to apply current technologies and develop applications for the problems. |
| | | | | CO4 | Graduates will get opportunities to practice as teams on multidisciplinary projects with effective writing and communication skills. |
| | | | | CO5 | Able to apply the engineering and management principles to achieve the goal of the project |

HCSE