



**PRATHUYSHA ENGINEERING COLLEGE**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**COURSES WITH COURSE OUTCOMES**

**REGULATION 2017**

Course Name	Course Outcomes
<b>SEMESTER I</b>	
HS8151- Communicative English	CO1: Read articles of a general kind in magazines and newspapers. CO2: Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English. CO3: Comprehend conversations and short talks delivered in English CO4: Write short essays of a general kind and personal letters and emails in English. CO5: Understand basic grammar principles and be able to synthesize and transform sentences.
MA8151 Engineering Mathematics I	CO1: Apply both the limit definition and rules of differentiation to different functions. Solve maxima and minima of functions. CO 2: To analyse and solve the partial differentiation for functions of several variables by various methods. CO 3: Evaluate integrals by using various techniques of integration such as substitution, partial fraction and by parts. CO 4: Apply integration to compute multiple integrals, Area, Volume in Polar in addition to change of order. CO 5: Apply various techniques in solving differential equations.
PH8151- Engineering Physics	CO 1: The students will gain knowledge on the basics of properties of matter and its applications. CO 2: The students will acquire knowledge on the concepts of waves and optical devices and their applications in fiber optics. CO 3: The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers. CO 4: The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes. CO 5: The students will understand the basics of crystals, their structures and different crystal growth techniques.
CY8151 - Engineering Chemistry	CO:1 Design water treatment techniques by analyzing the requirement of boiler feed water and its problems CO:2 Analyse the various Industrial applications of Surface Chemistry and Catalysis by understanding the basic concepts CO:3 Develop the applications to single and two component systems by understanding the basic concepts of phase rule and to appreciate the significance of alloys. CO:4 Analyzing the manufacture of various types of fuels and to interpret its calorific value during combustion CO:5 Evaluating the production of electricity from different non conventional energy sources and to analyse the types of batteries and its efficiency.

Course Name	Course Outcomes
GE8152 - Engineering Graphics	CO 1:Familiarize with the fundamentals and standards of Engineering graphics CO2:Perform freehand sketching of basic geometrical constructions and multiple views of objects. CO 3:Draw projections and solids and development of surfaces. CO 4:Visualize and to project isometric and perspective sections of simple solids. CO5: Draw orthographic projection of solids like cylinders, cones, prisms and pyramids including sections.
GE8151 – Problem Solving and Python Programming	CO 1:Adapt and analyse and develop standard algorithm to solve problem CO 2:Identify and use the appropriate data types for variable being critically aware of memory. CO 3:Design and implement control flow and function concept in python program for solving problem. CO 4:Implement python data structure list, tuple and dictionary for representing complex data problem. CO 5:Develop and Implement python file modules and function which reacts robust to exceptional input for solving real world problem.
GE 8161 – Problem Solving and Python Programming Laboratory	CO 1:Write, test, and debug simple Python programs. CO 2:Implement Python programs with conditionals and loops. CO 3:Develop Python programs step-wise by defining functions and calling them CO 4:Use Python lists, tuples, dictionaries for representing compound data CO 5:Read and write data from/to files in Python.
BS8161 - Physics & Chemistry Laboratory	CO 1:Apply physics principles of optics and thermal physics to evaluate engineering properties of material. CO 2:Apply principles of elasticity, optics and thermal properties for engineering applications. CO 3:Evaluating quantitative chemical analysis of water quality related Parameters CO4 :Knowledge of methods to determine the calorific value of fuels, perform flue gas analysis and combustion analysis. Apply the science for understanding corrosion and its prevention. CO5: Demonstrate a knowledge of superconducting and organic electronic materials.
<b>SEMESTER II</b>	
HS8251- Technical English	CO 1:Read technical texts and write area- specific texts effortlessly. CO 2:Listen and comprehend lectures and talks in their area of specialisation successfully. CO 3:Speak appropriately and effectively in varied formal and informal contexts. CO 4:Write reports and winning job applications. CO 5:Learn phonetic symbols and use correct sound, stress and intonation.

Course Name	Course Outcomes
MA8251 - Engineering Mathematics II	CO 1:Evaluate Eigen values and vectors, Diagonalization of matrices, positive definite matrices and similar matrices. CO2: Analyse and to solve the problem of vector differentiation and vector Integration. CO 3:Analyse and to solve the problem of analytic function, conformal mapping and bilinear transformations. CO 4:Evaluate the real integrals by applying the concept of complex integration CO 5:Analyse and apply the knowledge of Laplace Transform in solving ODE.
PH8252 Physics for Information science	CO 1:Gain knowledge on classical and quantum electron theories, and energy band structures, CO 2:Acquire knowledge on basics of semiconductor physics and its applications in various devices, CO 3:Get knowledge on magnetic properties of materials and their applications in data storage, CO 4:Have the necessary understanding on the functioning of optical materials for optoelectronics, CO 5:Understand the basics of quantum structures and their applications in carbon electronics.
BE 8255 Basic Electrical, Electronics and Measurement Engineering	CO 1:Discuss the essentials of electric circuits and analysis. CO 2:Discuss the basic operation of electric machines and transformers CO 3:Introduction of renewable sources and common domestic loads. CO 4:Introduction to measurement and metering for electric circuits. CO 5:Identify and select appropriate type of transducer for measurement of different quantities.
GE8291 Environmental science and Engineering	CO1:Analyze the concept of an ecosystem and biodiversity to protect the Environment. CO2:Design the environmental friendly process in engineering to protect environment from various pollutions. CO3:Evaluate the techniques which require optimum use of natural resources in Future. CO4:Demonstrate the need for sustainable development and to create awareness of important act and laws in respect to environment. CO5:Estimate the population and economic growth,energy requirement and demand.
CS 8251 Programming in C	CO 1:Develop and manage simple application in C using basic construct. CO 2:Design and implement application to work with array and string. CO 3:Develop and implement application related to good modular design with in the framework of function pointer. CO 4:Develop application in C using structure.

	CO 5:Design and implement real time application using file processing.
<b>Course Name</b>	<b>Course Outcomes</b>
GE 8261 Engineering Practice Laboratory	CO 1:Fabricate carpentry components and pipe connections including plumbing works. CO 2: Use welding equipments to join the structures. CO 3:Carry out the basic machining operations Make the models using sheet metal works. CO 4:Illustrate on centrifugal pump, Air conditioner, operations of smithy, foundary and fittings. CO 5:Carry out basic home electrical works and appliances Measure the electrical quantities.
CS 8261 C Programming Laboratory	CO 1: Learn the data types and syntax of C language. CO 2: Develop C programs for simple applications making use of basic constructs, arrays and strings. CO 3:Develop C programs involving functions, recursion, pointers, and structures. CO 4:Design applications using sequential and random access file processing. CO 5:Demonstrate capability to choose appropriate algorithm to get the solutions for a problem
<b>SEMESTER III</b>	
MA 8351 Discrete Mathematics	CO 1:Have knowledge of the concepts needed to test the logic of a program. CO 2:Have an understanding in identifying structures on many levels. CO 3:Be aware of a class of functions which transform a finite set into another finite set which relates to input and output functions in computer science. CO 4:Be aware of the counting principles. CO 5:Be exposed to concepts and properties of algebraic structures such as groups, rings and fields
CS 8391 Data Structures	CO 1:Implement abstract data types for linear data structures. CO 2:Identify the appropriate datastructures for the representation CO 3:Apply the different linear and non-linear data structures to problem solutions. CO 4:Apply and analyze the different approaches to solve the problems algorithmically CO 5:Critically analyze the various sorting algorithms.
CS8351 Digital Principles and Systems Design	CO 1:Simplify Boolean functions using KMap CO 2:Design and Analyze Combinational and Sequential Circuits CO 3:Implement designs using Programmable Logic Devices CO 4:Write HDL code for combinational and Sequential Circuits CO 5:Design and analyze synchronous and Asynchronous circuits

CS8392 Object Oriented Programming	CO 1:Develop Java programs using OOP principles CO 2:Develop Java programs with the concepts inheritance and interfaces CO 3:Build Java applications using exceptions and I/O streams CO 4:Develop Java applications with threads and generics classes CO 5:Develop interactive Java programs using swings
<b>Course Name</b>	<b>Course Outcomes</b>
EC8395 Communication Engineering	CO 1:Analyze and design analog modulation and demodulation system. CO 2:Analyze and design and develop pulse modulators and multiplex them. CO 3:Analyze and design digital modulation and demodulation system. CO 4:Perform coding techniques and apply error control codes for error control and correction. CO 5:Apply spread spectrum modulation techniques and multiple access system to enable.
CS 8382 Digital Principles and System Design Laboratory	CO 1:Implement simplified combinational circuits using basic logic gates. CO 2:Implement combinational circuits using MSI devices. CO 3:Implement sequential circuits like registers and counters. CO 4:Simulate combinational and sequential circuits using HDL. CO 5:Model Memory arrays for any Boolean function.
CS 8381 Data Structures Laboratory	CO 1: Implement linear and non-linear data structure operations. CO 2: Apply appropriate linear / non-linear data structure operations for solving a given problem. CO 3: Appropriately use the linear / non-linear data structure operations for a given problem. CO 4:Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval CO 5:Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data.
CS8382 Object Oriented Programming Laboratory	CO 1:Develop and implement Java programs for simple applications that make use of classes, packages and interfaces. CO 2:Develop and implement Java programs with arraylist, exception handling and multithreading . CO 3:Design applications using file processing, generic programming and event handling. CO 4:Understand dynamic memory management techniques using pointers, constructors, destructors, etc CO 5: Describe the concept of function overloading, operator overloading, virtual functions and polymorphism
HS 8381 Interpersonal Skills/ Listening and Speaking	CO 1:Listen and respond appropriately. CO 2:Participate in group discussions CO 3:Make effective presentations CO 4:Participate confidently and appropriately in conversations both formal and informal CO 5: Develop awareness of appropriate communication strategies.
<b>SEMESTER IV</b>	
MA8402 - Probability and Queueing Theory	CO 1:Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon. CO 2:Understand the basic concepts of one and two dimensional random

	<p>variables and apply in engineering applications.</p> <p>CO 3:Apply the concept of random processes in engineering disciplines.</p> <p>CO 4:Acquire skills in analyzing queueing models.</p> <p>CO 5:Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner</p>
<b>Course Name</b>	<b>Course Outcomes</b>
CS 8451- Design and Analysis of Algorithms	<p>CO 1:Design algorithms for various computing problems.</p> <p>CO 2:Apply the appropriate algorithms to solve the problems.</p> <p>CO 3:Analyze the time and space complexity of algorithms.</p> <p>CO 4:Critically analyze the different algorithm design techniques for a given problem.</p> <p>CO 5:Modify existing algorithms to improve efficiency.</p>
CS 8491 - Computer Organization and Architecture	<p>CO 1:Illustrate the basic structure and operation of digital computer</p> <p>CO 2:Design arithmetic and logic unit</p> <p>CO 3:Design and Analyze pipelined control units</p> <p>CO 4:Illustrate parallel processing architectures.</p> <p>CO 5:Evaluate performance of memory systems.</p>
CS8494- Software Engineering	<p>CO 1:Identify the key activities in managing a software project and Compare different process models.</p> <p>CO 2:Understand Concepts of requirements engineering and Analysis Modeling</p> <p>CO 3:Apply systematic procedure for software design and deployment.</p> <p>CO 4:Compare and contrast the various testing and maintenance.</p> <p>CO 5:Manage project schedule, estimate project cost and effort required</p>
CS 8493 - Operating Systems	<p>CO1:Understand the basics of operating systems like kernel, shell, types and views of operating systems</p> <p>CO 2:Design various Scheduling algorithms and apply the principles of concurrency with the Design of deadlock, prevention and avoidance algorithms and compare various memorymanagement schemes.</p> <p>CO3:Explain various memory management techniques and concept of thrashing</p> <p>CO 4:Use disk management and disk scheduling algorithmsfor better utilization of external memory and Recognize file system interface, protection and securitymechanisms.</p> <p>CO 5:Explore the architecture and features of Andriod OS and Linux.</p>
CS 8492- Database Management Systems	<p>CO 1:Design DB in SQL. Classify the modern and futuristic database applications based on size and complexity</p> <p>CO 2:Analyze and Map ER model to Relational model to perform database design effectively</p> <p>CO 3:Design DB using normalization criteria and optimize queries</p> <p>CO 4:Analyze, Compare and contrast various indexing strategies in different database systems</p>

	CO 5:Analyze and Appraise how advanced databases differ from traditional databases.
<b>Course Name</b>	<b>Course Outcomes</b>
CS8461 – Operating Systems Lab	CO 1:Compare the performance of various CPU Scheduling Algorithms CO 2:Implement Deadlock avoidance and Detection Algorithms CO 3:Implement Semaphores CO 4:Create processes and implement IPC CO 5:Analyze the performance of the various Page Replacement Algorithms
CS8481 - Database Management Systems Lab	CO 1:Design Databases for applications. CO 2:Use the Relational model, ER diagrams. CO 3:Apply concurrency control and recovery mechanisms for practical problems. CO 4:Design the Query Processor and Transaction Processor. CO 5:Apply security concepts to databases.
HS 8461Advanced Reading and writing	CO 1:Write different types of essays. CO 2:Write winning job applications. CO 3:Read and evaluate texts critically. CO 4:Display critical thinking in various professional contexts CO 5: Analyze a variety of communication acts.
<b>SEMESTER – V</b>	
MA8551 Algebra and Number Theory	CO 1:Apply the basic notions of groups, rings, fields. CO 2:Explain the fundamental concepts of advanced algebra. CO 3:Demonstrate accurate and efficient use of advanced algebraic techniques. CO 4:Demonstrate their manstry by solving non-trivial problems CO 5:Apply integrated approach to number theory and abstract algebra
CS8591- Computer Networks	CO 1:Understand the basic layer and its functions in computer networks CO 2:Evaluate and analysis the performance of network CO 3:Analyze the data flow from one Host to another host CO 4:Analyze and design the various functions and in the network CO 5:Create a node to node connectivity network for data sharing
CS8501 - Theory of Computation	CO 1:Construct automata, regular expression for any pattern. CO 2:Write Context free grammar for any construct. CO 3:Design Turing machines for any language. CO 4:Propose computation solutions using Turing machines. CO 5:Derive whether a problem is decidable or not.

CS8592 Object Oriented Analysis and Design	CO 1:Analyze the software design with UML diagrams CO 2:Design Software applications using OO concept CO 3:Identify various scenarios based on the requirements. CO 4:Transform UML based software design using design patterns. CO 5:Understand the various testing methodologies.
<b>Course Name</b>	<b>Course Outcomes</b>
EC 8691- Microprocessors and Microcontrollers	CO 1:Design and execute programs based on 8086 microprocessor CO 2:Design memory interfacing circuits CO 3:Design and interface microprocessors with supporting CO 4:Design and analyze the architecture of 8051 microcontroller CO 5:Design and analyze the microcontroller based system
OCE552 Geographic Information systems	CO 1:Having the basic idea of fundamentals of GIS CO 2:Understand the types of datamodels CO 3:Get knowledge about data inputs and topologoly CO 4:Get knowledge on data quality and standards CO 5:Understand data management functions and data input.
CS8581 - Networks Laboratory	CO 1:Implement various protocols using TCP and UDP. CO 2:Compare the performance of different transport layer protocols. CO 3:Use simulation tools to analyze the performance of various network protocols. CO 4:Analyze various routing algorithms. CO 5:Implement error correction codes.
CS8582 - Object Oriented Analysis & Design Lab	CO 1: Demonstrate the Conceptual model of UML and SDLC. CO 2: Define classes modeling techniques and instances modeling techniques CO 3: Describe interaction diagrams and their modeling techniques. CO 4: Demonstrate activity diagram and their modeling techniques. CO 5: Demonstrate component and deployment diagram
EC8681 – Microprocessors and Microcontroller Laboratory Lab	CO 1:Write ALP Programmes for fixed and Floating Point and Arithmetic operations CO 2:Interface different I/Os with processor CO 3:Generate waveforms using Microprocessors CO 4:Execute Programs in 8051 CO 5:Explain the difference between simulator and Emulator
<b>SEMESTER VI</b>	
CS8691- Artificial Intelligence	CO 1:Use appropriate search algorithms for any AI problem CO 2:Represent a problem using first order and predicate logic CO 3:Provide the apt agent strategy to solve a given problem CO 4:Design software agents to solve a problem CO 5:Design applications for NLP that use Artificial Intelligence.

Course Name	Course Outcomes
CS8651 Internet Programming	CO 1:Develop a basic website using HTML and Cascading Style Sheets CO 2:Design and develop a dynamic web page with validation using JavaScript CO 3:Design and develop a server side programs using Servlets and JSP CO 4:Build a simple web page in PHP with XML data format CO 5:Develop interactive web application using web service and AJAX
CS8602- Compiler Design	CO 1:Understand the different phases of compiler. CO 2:Design a lexical analyzer for a sample language. CO 3:Apply different parsing algorithms to develop the parsers for a given grammar. CO 4: Understand syntax-directed translation and run-time environment. CO 5:Learn to implement code optimization techniques and a simple code generator
CS8601 Mobile Computing	CO 1:Understand the basics of mobile telecommunication system CO 2:Choose the required functionality at each layer for given application CO 3:Identify solution for each functionality at each layer CO 4:Use simulator tools and design Ad hoc networks develop a mobile application CO 5:Design an Hybrid Mobile Application
CS8603 Distributed Systems	CO 1:Elucidate the foundations and issues of distributed systems CO 2:Understand the various synchronization issues and global state for distributed systems. CO 3:Understand the Mutual Exclusion and Deadlock detection algorithms in distributed systems CO 4:Describe the agreement protocols and fault tolerance mechanisms in distributed systems. CO 5:Describe the features of peer-to-peer and distributed shared memory system
IT8076 Software Testing	CO 1:Have an ability to apply software testing knowledge and engineering methods. CO 2:Have an ability to understand software testing problems and solve them. CO 3:Have an ability to design and conduct various types and levels of software testing. CO 4:Have basic knowledge of contemporary issues in software testing & planning. CO 5:Have an ability to identify the needs of software test automation and develop a test tool to support test automation.

CS8661 - Internet Programming Lab	CO 1:Develop a Web Page using HTML and CSS CO 2:Build a dynamic web page using java script CO 3:Develop a dynamic web page using Server side scripting CO 4:Develop Web application using PHP CO 5:Construct Web application using AJAX and web service
<b>Course Name</b>	<b>Course Outcomes</b>
CS8662 – Mobile Application Development Laboratory	CO 1:Develop mobile applications using GUI and Layouts. CO 2:Develop mobile applications using Event Listener. CO 3:Develop mobile applications using Databases. CO 4:Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi-threading and GPS. CO 5:Analyze and discover own mobile app for simple needs.
CS8611 Miniproject	CO 1: The ability to make links across different areas of domain knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. CO2 : Acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms. CO3 : Acquire collaborative skills through working in a team to achieve common goals. CO 4: Acquire collaborative skills through working in a team to achieve common goals. CO 5:Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.
HS8581Professional Communication	CO 1:Make effective presentations CO 2:Participate confidently in Group Discussions. CO 3:Attend job interviews and be successful in them. CO 4:Develop adequate Soft Skills required for the workplace CO 5: Develop awareness of appropriate communication strategies.
<b>SEMESTER VII</b>	
MG8591 -Principle of Management	CO 1: Identify and communicate the purpose and functions of management. CO2: Demonstrate an understanding of the impact of globalisation on management and the role cultural factors play in the workplace CO3: Discuss methods of employee compensation and their impact on employee motivation CO 4: Illustrate the components of business strategy. CO 5: Apply the concepts of decision making in a business situation.
CS 8792 - Cryptography and Network Security	CO 1:Understand the fundamentals of networks security, security architecture, threats and vulnerabilities CO 2:Apply the different cryptographic operations of symmetric cryptographic algorithms CO 3:Apply the different cryptographic operations of public key cryptography CO 4:Apply the various Authentiction schemes to simulate different applications. CO 5:Understand various Security practices and System security standards.
CS 8791 Cloud computing	CO 1:Articulate the main concepts, key technologies, strengths and limitations of cloud computing. CO 2:Learn the key and enabling technologies that help in the development of cloud.

	<p>CO 3:Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.</p> <p>CO 4:Explain the core issues of cloud computing such as resource management and security.</p> <p>CO 5:Be able to install and use current cloud technologies.</p>
<b>Course Name</b>	<b>Course Outcomes</b>
OME752 - Supply Chain Management	<p>CO1: To understand the scope and fundamentals of Supply Chain Management and the drivers of Supply Chain performance</p> <p>CO2: To design suitable SC network for a given situation.</p> <p>CO3: To solve the issues related to Logistics in Supply Chain Management.</p> <p>CO4: To understand Sourcing, Coordination and current issues in Supply Chain Management.</p> <p>CO5: Critically appraise the applications of IT in Supply Chain Management and apply supply Chain Management concepts in selected enterprise</p>
GE8077 – Total Quality Management	<p>CO1: Apply the tools and techniques of quality management to manufacturing and service process.</p> <p>CO2: Evaluate the principles of quality management and to explain how these principles can be applied within quality management systems.</p> <p>CO3: Identify the key aspects of the quality improvement cycle and to select and use appropriate tools and techniques for controlling, improving and measuring quality.</p> <p>CO4 : Critically appraise the organizational, communication and teamwork requirements for effective quality management</p> <p>CO5: Critically analyse the strategic issues in quality management, including current issues and developments, and to devise and evaluate quality implementation plans</p>
CS 8079 Human Computer Interaction	<p>CO 1:Design effective dialog for HCI</p> <p>CO 2:Design effective HCI for individuals and persons with disabilities.</p> <p>CO 3:Assess the importance of user feedback.</p> <p>CO 4:Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.</p> <p>CO 5:Develop meaningful user interface.</p>
CS 8711 Cloud Computing Laboratory	<p>CO 1:Configure various virtualization tools such as Virtual Box, VMware workstation.</p> <p>CO 2:Design and deploy a web application in a PaaS environment.</p> <p>CO 3:Learn how to simulate cloud environment to implement new schedulers.</p> <p>CO 4:Install and use a generic cloud environment that can be used as a private cloud.</p> <p>CO 5:Manipulate large data sets in a parallel environment.</p>
IT8761 Security Laboratory	<p>CO 1:Develop code for classical Encryption Techniques to solve the problems.</p> <p>CO 2:Build cryptosystems by applying symmetric and public key encryption algorithms.</p> <p>CO 3:Construct code for authentication algorithms.</p> <p>CO 4:Develop a signature scheme using Digital signature standard.</p>

	CO 5:Demonstrate the network security system using open source tools
<b>Course Name</b>	<b>Course Outcomes</b>
<b>SEMESTER VIII</b>	
GE8076 – Professional Ethics in Engineering	CO1: Construct a basic perception on various moral, human values and ethics. CO2:Identify and analyze profession, professional ethics, moral issues and the role of ethical theories in engineering field CO3: Identify an insight of social responsibilities and the code of ethics to be followed by an engineer. CO4: Identify the professional rights and responsibilities of an engineer for safety and risk benefit analysis. CO5:Apply ethical principles to resolve situations that arise in their professional lives.
CS8080 Information Retrieval Techniques	CO 1:Use an open source search engine framework and explore its capabilities CO 2:Apply appropriate method of classification or clustering. CO 3: Ability to use knowledge of data structures and indexing methods in information retrieval Systems CO 4:Design and implement innovative features in a search engine. CO 5:Design and implement a recommender system.
CS8811 Project Work	CO 1: The ability to make links across different areas of domain knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. CO2 : Acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms. CO3 : Acquire collaborative skills through working in a team to achieve common goals. CO 4: Acquire collaborative skills through working in a team to achieve common goals. CO 5: Demonstrate and build the project successfully by hardware requirements, coding, emulating and testing.

