INFO INSTITUTE OF ENGINEERING,COIMBATORE

DEPARTMENT OF INFORMATION TECHNOLOGY

PROGRAM OUTCOMES

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instruction

11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME EDUCATIONAL OBJECTIVES

- To ensure graduates will be proficient in utilizing the fundamental knowledge of basic sciences, mathematics and Information Technology for the applications relevant to various streams of Engineering and Technology.
- To enrich graduates with the core competencies necessary for applying knowledge of computers and telecommunications equipment to store, retrieve, transmit, manipulate and analyze data in the context of business enterprise.
- To enable graduates to think logically, pursue lifelong learning and will have the capacity to understand technical issues related to computing systems and to design optimal solution
- To enable graduates to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context.
- To enable graduates to gain employment in organizations and establish themselves as professionals by applying their technical skills to solve real world problems and meet the diversified needs of industry, academia and research

PROGRAM SPECIFIC OUTCOMES

- To create, select, and apply appropriate techniques, resources, modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
- To manage complex IT projects with consideration of the human, financial, ethical and environmental factors and an understanding of risk management processes, and operational and policy implications.

COURSE OUTCOMES

Regulation 2017 Anna University Chennai

SUBJECT	COs	

IV Semester		
MA8402 Probability and Queueing Theory	CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
	CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
	CO3	Apply the concept of random processes in engineering disciplines
	CO4	Acquire skills in analyzing queueing models.
	CO5	Understand and characterize phenomenon which evolve with respect to time in a probabilistic manner
CS8491 Computer Architecture	CO1	Understand the basics structure of computers, operations and instructions.
	CO2	Design arithmetic and logic unit.
	CO3	Understand pipelined execution and design control unit.
	CO4	Understand parallel processing architectures.
	CO5	Understand the various memory systems and I/O communication.
CS8492 Database Management Systems	CO1	Classify the modern and futuristic database applications based on size and complexity
	CO2	Map ER model to Relational model to perform database design effectively
	CO3	Write queries using normalization criteria and optimize queries
	CO4	Compare and contrast various indexing strategies in different database systems
	CO5	Appraise how advanced databases differ from traditional databases
CS8491 Design and Analysis of	CO1	Design algorithms for various computing problems.

Algorithms	CO2	Analyze the time and space complexity of algorithms
	CO3	Critically analyze the different algorithm design techniques for a given problem.
	CO4	Modify existing algorithms to improve efficiency
CS8493 Operating Systems	CO1	Analyze various scheduling algorithms.
	CO2	Understand deadlock, prevention and avoidance algorithms.
	CO3	Compare and contrast various memory management schemes.
	CO4	Understand the functionality of file systems
	CO5	Perform administrative tasks on Linux Servers.
	CO6	Compare iOS and Android Operating Systems
CS8494 Software Engineering	CO1	Identify the key activities in managing a software project
	CO2	Compare different process models.
	CO3	Concepts of requirements engineering and Analysis Modeling.
	CO4	Apply systematic procedure for software design and deployment
	CO5	Compare and contrast the various testing and maintenance.
	CO6	Manage project schedule, estimate project cost and effort required.
CS8481 Database Management Systems Laboratory	CO1	Use typical data definitions and manipulation commands.
	CO2	Design applications to test Nested and Join Queries
	CO3	Implement simple applications that use Views
	CO4	Implement applications that require a Front-end Tool
	CO5	Critically analyze the use of Tables, Views, Functions and Procedures
CS8461 Operating Systems Laboratory	CO1	Compare the performance of various CPU Scheduling Algorithms
	CO2	Implement Deadlock avoidance and Detection Algorithms
	CO3	Implement Semaphores
	CO4	Create processes and implement IPC
	CO5	Analyze the performance of the various Page Replacement Algorithms
	CO6	Implement File Organization and File Allocation Strategies

HS8461 Advanced Reading and Writing	CO1	Write different types of essays
	CO2	Write winning job applications.
	CO3	Read and evaluate texts critically
	CO4	Display critical thinking in various professional contexts

V Semester		
MA8551 Algebra and Number Theory	CO1	Apply the basic notions of groups, rings, fields which will then be used to solve related problems.
	CO2	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
	CO3	Demonstrate accurate and efficient use of advanced algebraic techniques.
	CO4	Demonstrate their mastery by solving non - trivial problems related to the concepts, and by proving simple theorems about the, statements proven by the text.
	CO5	Apply integrated approach to number theory and abstract algebra, and provide a firm basis for further reading and study in the subject.
CS8591 Computer Networks	CO1	Understand the basic layers and its functions in computer networks.
	CO2	Evaluate the performance of a network.
	CO3	Understand the basics of how data flows from one node to another.
	CO4	Analyze and design routing algorithms.
	CO5	Design protocols for various functions in the network.
	CO6	Understand the working of various application layer
EC8691 Microprocessors and Microcontrollers	CO1	Understand and execute programs based on 8086 microprocessor.
	CO2	Design Memory Interfacing circuits.
	CO3	Design and interface I/O circuits.
	CO4	Design and implement 8051 microcontroller based systems.
IT8501	CO1	Design simple web pages using markup languages like HTML and XHTML.

Web Technology	CO2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
	CO3	Program server side web pages that have to process request from client side web pages.
	CO4	Represent web data using XML and develop web pages using JSP.
	CO5	Understand various web services and how these web services interact.
CS8494 Software Engineering	CO1	Identify the key activities in managing a software project.
	CO2	Compare different process models.
	CO3	Concepts of requirements engineering and Analysis Modeling.
	CO4	Apply systematic procedure for software design and deployment.
	CO5	Compare and contrast the various testing and maintenance.
	CO6	Manage project schedule, estimate project cost and effort required.
OMD552 Hospital Waste Management	CO1	Upon completion of the course, the students will be able to
	CO2	Explain healthcare hazard control responsibility, management, accident analysis & prevention.
	CO3	Interpret biomedical waste handling & disposal.
	CO4	Summarize hazardous materials & respiratory protection.
	CO5	Summarize facility guidelines & safety maintenance.
	CO6	Outline infection control, prevention and patient safety.
EC8681 Microprocessors and Microcontrollers Laboratory	CO1	Write ALP Programmes for fixed and Floating Point and Arithmetic operation
	CO2	Interface different I/Os with processor
	CO3	Generate waveforms using Microprocessors
	CO4	Execute Programs in 8051
	CO5	Explain the difference between simulator and Emulator

IT8511 Web Technology	CO1	Design simple web pages using markup languages like HTML and XHTML.
	CO2	Create dynamic web pages using DHTML and java script that is easy to navigate and use.
	CO3	Program server side web pages that have to process request from client side web pages.
	CO4	Represent web data using XML and develop web pages using JSP.
	CO5	Understand various web services and how these web services interact.
CS8581 Networks Laboratory	CO1	Implement various protocols using TCP and UDP.
	CO2	Compare the performance of different transport layer protocols.
	CO3	Use simulation tools to analyze the performance of various network protocols.
	CO4	Analyze various routing algorithms
	CO5	Implement error correction codes.

VI Semester		
IT8601 Computational Intelligence	CO1	Provide a basic exposition to the goals and methods of Computational Intelligence.
	CO2	Study of the design of intelligent computational techniques.
	CO3	Apply the Intelligent techniques for problem solving
	CO4	Improve problem solving skills using the acquired knowledge in the areas of, reasoning, natural language understanding, computer vision, automatic programming and machine learning.
CS8091 Big Data Analytics	CO1	Work with big data tools and its analysis techniques
	CO2	Analyze data by utilizing clustering and classification algorithms
	CO3	Learn and apply different mining algorithms and recommendation systems for large volumes of data
	CO4	Perform analytics on data streams
	CO5	Learn NoSQL databases and management.
IT8602 Mobile	CO1	Explain the basics of mobile telecommunication system
	CO2	Illustrate the generations of telecommunication systems in

Communication		wireless network
	CO3	Understand the architecture of Wireless LAN technologies
	CO4	Determine the functionality of network layer and Identify a routing protocol for a given Ad hoc networks
	CO5	Explain the functionality of Transport and Application layer
CS8092 Computer Graphics and Multimedia	CO1	Design two dimensional graphics.
	CO2	Apply two dimensional transformations.
	CO3	Design three dimensional graphics.
	CO4	Apply three dimensional transformations.
	CO5	Apply Illumination and color models.
	CO6	Apply clipping techniques to graphics.
	CO7	Understood Different types of Multimedia File Format
	CO8	Design Basic 3d Scenes using Blender
CS8592 Object Oriented Analysis and Design	CO1	Express software design with UML diagrams
	CO2	Design software applications using OO concepts.
	CO3	Identify various scenarios based on software requirements
	CO4	Transform UML based software design into pattern based design using design patterns
	CO5	Understand the various testing methodologies for OO software
CS8582 Object Oriented Analysis and Design Laboratory	CO1	Perform OO analysis and design for a given problem specification
	CO2	Identify and map basic software requirements in UML mapping.
	CO3	Improve the software quality using design patterns and to explain the rationale behind applying specific design patterns
	CO4	Test the compliance of the software with the SRS.
CS8662 Mobile Application Development Laboratory	CO1	Develop mobile applications using GUI and Layouts.
	CO2	Develop mobile applications using Event Listener.
	CO3	Develop mobile applications using Databases.
	CO4	Develop mobile applications using RSS Feed, Internal/External Storage, SMS, Multi- threading and GPS.

	CO5	Analyze and discover own mobile app for simple needs.
HS8581 Professional Communication Laboratory	CO1	Make effective presentations
	CO2	Participate confidently in Group Discussions.
	CO3	Attend job interviews and be successful in them
	CO4	Develop adequate Soft Skills required for the workplace Recommended Software 1. Globearena 2. Win English
IT8611 Mini Project	CO1	
	CO2	
	CO3	
	CO4	
	CO5	

VII Semester		
MG8591 Principles of Management	CO1	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling and have same basic knowledge on international aspect of management
CS8792 Cryptography and Network Security	CO1	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
	CO2	Apply the different cryptographic operations of symmetric cryptographic algorithms
	CO3	Apply the different cryptographic operations of public key cryptography
	CO4	Apply the various Authentication schemes to simulate different applications.
	CO5	Understand various Security practices and System security standards
CS8791 Cloud Computing	CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
	CO2	Learn the key and enabling technologies that help in the development of cloud.
	CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.

	CO4	Explain the core issues of cloud computing such as resource management and security.
	CO5	Be able to install and use current cloud technologies.
	CO6	Evaluate and choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
GE8074 Human Rights	CO1	Engineering students will acquire the basic knowledge of human rights.
OBM752 Hospital Management	CO1	Explain the principles of Hospital administration.
	CO2	Identify the importance of Human resource management.
	CO3	List various marketing research techniques
	CO4	Identify Information management systems and its uses.
	CO5	Understand safety procedures followed in hospitals
CS8711 Cloud Computing Laboratory	CO1	Configure various virtualization tools such as Virtual Box, VMware workstation.
	CO2	Design and deploy a web application in a PaaS environment.
	CO3	Learn how to simulate a cloud environment to implement new schedulers.
	CO4	Install and use a generic cloud environment that can be used as a private cloud.
	CO5	Manipulate large data sets in a parallel environment
IT8761 Security Laboratory	CO1	Develop code for classical Encryption Techniques to solve the problems.
	CO2	Build cryptosystems by applying symmetric and public key encryption algorithms.
	CO3	Construct code for authentication algorithms.
	CO4	Develop a signature scheme using Digital signature standard.
	CO5	Demonstrate the network security system using open source tools

VIII Semester		
CS8078 Green Computing	CO1	Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.
	CO2	Enhance the skill in energy saving practices in their use of hardware.
	CO3	Evaluate technology tools that can reduce paper waste and

		carbon footprint by the stakeholders.
	CO4	Understand the ways to minimize equipment disposal requirements .
GE8076 Professional Ethics in Engineering	CO1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
CS8811 Project Work	CO1	Identify the problem by applying acquired knowledge and categorize executable project modules after considering risks Analyzing
	CO2	Choose efficient tools for designing project module and Combine all the modules through effective team work after efficient testing

ELECTIVE I		
Software Testing	CO1	Design test cases suitable for a software development for different domains.
	CO2	Identify suitable tests to be carried out.
	CO3	Prepare test planning based on the document.
	CO4	Document test plans and test cases designed.
	CO5	Use automatic testing tools.
	CO6	Develop and validate a test plan
Graph Theory and Applications	CO1	Understand the basic concepts of graphs, and different types of graphs
	CO2	Understand the properties, theorems and be able to prove theorems
	CO3	Apply suitable graph model and algorithm for solving applications.

Digital Signal Processing	CO1	Perform mathematical operations on signals.
	CO2	Understand the sampling theorem and perform sampling on continuous-time signals to get discrete time signal by applying advanced knowledge of the sampling theory.
	CO3	Transform the time domain signal into frequency domain signal and vice-versa.
	CO4	Apply the relevant theoretical knowledge to design the digital IIR/FIR filters for the given analog specifications
Information Storage and Management	CO1	Understand the logical and physical components of a Storage infrastructure.
	CO2	Evaluate storage architectures, including storage subsystems, DAS, SAN, NAS, and CAS.
	CO3	Understand the various forms and types of Storage Virtualization.
	CO4	Describe the different role in providing disaster recovery and business continuity capabilities.
	CO5	Distinguish different remote replication technologies.
Agile Methodologies	CO1	Realize the importance of interacting with business stakeholders in determining the requirements for a software system
	CO2	Perform iterative software development processes: how to plan them, how to execute them.
	CO3	Point out the impact of social aspects on software development success.
	CO4	Develop techniques and tools for improving team collaboration and software quality.
	CO5	Perform Software process improvement as an ongoing task for development teams.
	CO6	Show how agile approaches can be scaled up to the enterprise level.
Embedded Systems	CO1	Describe the architecture and programming of ARM processor.
	CO2	Explain the concepts of embedded systems
	CO3	Understand the Concepts of peripherals and interfacing of sensors.
	CO4	Capable of using the system design techniques to develop firmware
	CO5	Illustrate the code for constructing a system

Intellectual Property Rights	CO1	Ability to manage Intellectual Property portfolio to enhance the value of the firm.

ELECTIVE II		
Web Development Frameworks	CO1	Analyze the fundamentals of web framework
	CO2	Use the concept of Java web framework
	CO3	Implement the concept using Struts framework
	CO4	Apply the concept of python web framework to the problem solutions.
	CO5	Critically analyze the various Web frameworks.
Machine Learning Techniques	CO1	Differentiate between supervised, unsupervised, semi-supervised machine learning approaches
	CO2	Apply specific supervised or unsupervised machine learning algorithm for a particular problem
	CO3	Analyse and suggest the appropriate machine learning approach for the various types of problem
	CO4	Design and make modifications to existing machine learning algorithms to suit an individual application
	CO5	Provide useful case studies on the advanced machine learning algorithms
Formal Languages and Automata Theory	CO1	Design a finite automaton for a specific language.
	CO2	Design a Turing machine.
	CO3	Select appropriate grammar for the implementation of compiler phases
	CO4	Design a lexical analyzer
	CO5	Design a simple parser
	CO6	Design and implement techniques used for optimization by a compiler.
	CO7	Write a very simple code generator
Internet of Things	CO1	Explain the concept of IoT.
	CO2	Analyze various protocols for IoT.
	CO3	Design a PoC of an IoT system using Rasperry Pi/Arduino
	CO4	Apply data analytics and use cloud offerings related to IoT

	CO5	Analyze applications of IoT in real time scenario
Software Project Management	CO1	Understand Project Management principles while developing software.
	CO2	Gain extensive knowledge about the basic project management concepts, framework and the process models.
	CO3	Obtain adequate knowledge about software process models and software effort estimation techniques.
	CO4	Estimate the risks involved in various project activities.
	CO5	Define the checkpoints, project reporting structure, project progress and tracking mechanisms using project management principles.
	CO6	Learn staff selection process and the issues related to people management
Service Oriented Architecture	CO1	Understand XML technologies
	CO2	Understand service orientation, benefits of SOA
	CO3	Understand web services and WS standards
	CO4	Use web services extensions to develop solutions
	CO5	Understand and apply service modeling, service oriented analysis and design for application development
Total Quality Management	CO1	The student would be able to apply the tools and techniques of quality management to manufacturing and services processes

ELECTIVE III		
CS8079 Human Computer Interaction	CO1	Design effective dialog for HCI
	CO2	Design effective HCI for individuals and persons with disabilities
	CO3	Assess the importance of user feedback.
	CO4	Explain the HCI implications for designing multimedia/ ecommerce/ e-learning Web sites.
	CO5	Develop meaningful user interface.
CS8073 C# and .Net Programming	CO1	Write various applications using C# Language in the .NET Framework.
	CO2	Develop distributed applications using .NET Framework.
	CO3	Create mobile applications using .NET compact Framework.
CS8088	CO1	Identify different issues in wireless ad hoc and sensor networks .

Wireless Ad hoc and Sensor Networks	CO2	To analyze protocols developed for ad hoc and sensor networks
	CO3	To identify and understand security issues in ad hoc and sensor networks.
GE8072 Foundation Skills in Integrated Product Development	CO1	Define, formulate and analyze a problem
	CO2	Solve specific problems independently or as part of a team
	CO3	Gain knowledge of the Innovation & Product
	CO4	Development process in the Business Context
	CO5	Work independently as well as in teams
	CO6	Manage a project from start to finish
CS8071 Advanced Topics on Databases	CO1	To develop in-depth understanding of relational databases and skills to optimize database performance in practice.
	CO2	To understand and critique on each type of databases.
	CO3	To design faster algorithms in solving practical database problems.
	CO4	To implement intelligent databases and various data models.
GE8071 Disaster Management	CO1	Differentiate the types of disasters, causes and their impact on environment and society
	CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
	CO3	Draw the hazard and vulnerability profile of India, Scenarious in the Indian context, Disaster damage assessment and management.

ELECTIVE IV		
CS8085 Social Network Analysis	CO1	Develop semantic web related applications.
	CO2	Represent knowledge using ontology
	CO3	Predict human behaviour in social web and related communities.
	CO4	Visualize social networks
CS8086 Soft Computing	CO1	Apply suitable soft computing techniques for various applications.
	CO2	Integrate various soft computing techniques for complex problems.
CS8074 Cyber Forensics	CO1	Understand the basics of computer forensics
	CO2	Apply a number of different computer forensic tools to a given scenario

	CO3	Analyze and validate forensics data
	CO4	Identify the vulnerabilities in a given network infrastructure
	CO5	Implement real-world hacking techniques to test system security
IT8073 Information Security	CO1	Discuss the basics of information security
	CO2	Illustrate the legal, ethical and professional issues in information security
	CO3	Demonstrate the aspects of risk management.
	CO4	Become aware of various standards in the Information Security System
	CO5	Design and implementation of Security Techniques.
EC8093 Digital Image Processing	CO1	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
	CO2	Operate on images using the techniques of smoothing, sharpening and enhancement.
	CO3	Understand the restoration concepts and filtering techniques.
	CO4	Learn the basics of segmentation, features extraction, compression and recognition methods for color models.
IT8004 Network Management	CO1	Gather, derive, define and validate real requirements for the specified network.
	CO2	Understand different types of requirements from the user, application, device and network component
	CO3	Develop traceability between requirements, architecture decisions, and design decisions
	CO4	Implement how and where addressing and routing, security, network management, and performance are required in the network.
	CO5	Use SNMPv1, v2 and v3 protocols.
GE8076 Professional Ethics in Engineering	CO1	Upon completion of the course, the student should be able to apply ethics in society, discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.

ELECTIVE V		
CS8080 Information Retrieval Techniques	CO1	Use an open source search engine framework and explore its capabilities
	CO2	Apply appropriate method of classification or clustering.
	CO3	Design and implement innovative features in a search engine.
	CO4	Design and implement a recommender system.
CS8078 Green Computing	CO1	Acquire knowledge to adopt green computing practices to minimize negative impacts on the environment.
	CO2	Enhance the skill in energy saving practices in their use of hardware.
	CO3	Evaluate technology tools that can reduce paper waste and carbon footprint by the stakeholders.
	CO4	Understand the ways to minimize equipment disposal requirements .
CS8084 Natural Language Processing	CO1	To tag a given text with basic Language features
	CO2	To design an innovative application using NLP components
	CO3	To implement a rule based system to tackle morphology/syntax of a language
	CO4	To design a tag set to be used for statistical processing for real-time applications
	CO5	To compare and contrast the use of different statistical approaches for different types of NLP applications
IT8077 Speech Processing	CO1	Create new algorithms with speech processing
	CO2	Derive new speech models
	CO3	Perform various language phonetic analysis
	CO4	Create a new speech identification system
	CO5	Generate a new speech recognition system
IT8078 Web Design and Management	CO1	Design Website using HTML CSS and JS
	CO2	Design Responsive Sites
	CO3	Manage, Maintain and Support Web Apps
IT8005 Electronic Commerce	CO1	Design Website using HTML CSS and JS
	CO2	Design Responsive Sites

	CO3	Manage, Maintain and Support Web Apps
GE8073 Fundamentals of Nano Science	CO1	Will familiarize about the science of nanomaterials
	CO2	Will demonstrate the preparation of nanomaterials
	CO3	Will develop knowledge in characteristic nanomaterial