ST. JOSEPH'S COLLEGE OF ENGINEERING AND TECHNOLOGY, THANJAVUR
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING COURSE OUTCOME

				REGULATION : 2021
S.No	Sem	Course Code	Course Name	Course Outcome
1	I	HS3152	Professional English - I	CO1:To use appropriate words in a professional context
				CO2:To gain understanding of basic grammatic structures and use them in right context.
				CO3:To read and infer the denotative and connotative meanings of technical texts
				CO4:To write definitions, descriptions, narrations and essays on various topics
2		MA3151	Matrices and Calculus	CO1:Use the matrix algebra methods for solving practical problems.
				CO2:Apply differential calculus tools in solving various application problems.
				CO3:Able to use differential calculus ideas on several variable functions.
				CO4:Apply different methods of integration in solving practical problems.
				CO5:Apply multiple integral ideas in solving areas, volumes and other practical problems.
3		PH3151	Engineering Physics	CO1:Understand the importance of mechanics.
				CO2:Express their knowledge in electromagnetic waves.
				CO3:Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
				CO4:Understand the importance of quantum physics.
				CO5:Comprehend and apply quantum mechanical principles towards the formation of energy bands.
4		CY3151	Engineering Chemistry	CO1:To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
				CO2:To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
				CO3:To apply the knowledge of phase rule and composites for material selection requirements.
				CO4:To recommend suitable fuels for engineering processes and applications.
				CO5:To recognize different forms of energy resources and apply them for suitable applications in energy sectors.
5		GE3151	Problem Solving and Python Programming	CO1: Develop algorithmic solutions to simple computational problems.
				CO2: Develop and execute simple Python programs.
				CO3: Write simple Python programs using conditionals and loops for solving problems.
				CO4: Decompose a Python program into functions.
				CO5: Represent compound data using Python lists, tuples, dictionaries etc.
				CO6: Read and write data from/to files in Python programs.
6	II	HS3252	Professional English - II	CO1:To compare and contrast products and ideas in technical texts.
				CO2:To identify and report cause and effects in events, industrial processes through technical texts
				CO3:To analyse problems in order to arrive at feasible solutions and communicate them in the written format.
				CO4:To present their ideas and opinions in a planned and logical manner
				CO5:To draft effective resumes in the context of job search.

7		MA3251	Statistics and Numerical Methods	CO1:Apply the concept of testing of hypothesis for small and large samples in real life problems.
				CO2:Apply the basic concepts of classifications of design of experiments in the field of agriculture.
				CO3:Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
				CO4:Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
				CO5:Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
8	II	PH3256	Physics for Information Science	CO1:gain knowledge on classical and quantum electron theories, and energy band structures
				CO2:acquire knowledge on basics of semiconductor physics and its applications in various devices
				CO3:get knowledge on magnetic properties of materials and their applications in data storage,
				CO4:have the necessary understanding on the functioning of optical materials for optoelectronics
				CO5:understand the basics of quantum structures and their applications and basics of quantum Computing
9		BE3251	Basic Electrical and Electronics Engineering	CO1: Compute the electric circuit parameters for simple problems
				CO2: Explain the working principle and applications of electrical machines
				CO3: Analyze the characteristics of analog electronic devices
				CO4: Explain the basic concepts of digital electronics
				CO5: Explain the operating principles of measuring instruments
10		GE3251	Engineering Graphics	CO1:Use BIS conventions and specifications for engineering drawing.
				CO2:Construct the conic curves, involutes and cycloid.
				CO3:Solve practical problems involving projection of lines.
				CO4:Draw the orthographic, isometric and perspective projections of simple solids.
				CO5:Draw the development of simple solids
11		CS3251	Programming in C	CO1: Demonstrate knowledge on C Programming constructs
				CO2: Develop simple applications in C using basic constructs
				CO3: Design and implement applications using arrays and strings
				CO4: Develop and implement modular applications in C using functions.
				CO5: Develop applications in C using structures and pointers.
				CO6: Design applications using sequential and random access file processing.
12	III	MA3354	Discrete Mathematics	CO1:Have knowledge of the concepts needed to test the logic of a program.
				CO2:Have an understanding in identifying structures on many levels.
				CO3: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.
				CO4:Be aware of the counting principles.
				CO5:Be exposed to concepts and properties of algebraic structures such as groups, rings and fields.
13		CS3351	Digital Principles and Computer Organization	CO1 : Design various combinational digital circuits using logic gates
				CO2 : Design sequential circuits and analyze the design procedures
				CO3 : State the fundamentals of computer systems and analyze the execution of an instruction
				CO4 : Analyze different types of control design and identify hazards
				CO5 : Identify the characteristics of various memory systems and I/O communication

14	III	CS3352	Foundations of Data Science	CO1: Define the data science process
				CO2: Understand different types of data description for data science process
				CO3: Gain knowledge on relationships between data
				CO4: Use the Python Libraries for Data Wrangling
				CO5: Apply visualization Libraries in Python to interpret and explore data
15		CS3301	Data Structures	CO1: Define linear and non-linear data structures.
				CO2: Implement linear and non–linear data structure operations.
				CO3: Use appropriate linear/non–linear data structure operations for solving a given problem.
				CO4: Apply appropriate graph algorithms for graph applications.
				CO5: Analyze the various searching and sorting algorithms.
16		CS3391	Object Oriented Programming	CO1:Apply the concepts of classes and objects to solve simple problems
				CO2:Develop programs using inheritance, packages and interfaces
				CO3:Make use of exception handling mechanisms and multithreaded model to solve real world problems
				CO4:Build Java applications with I/O packages, string classes, Collections and generics concepts
				CO5:Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications
17	IV	CS3452	Theory of Computation	CO1: Construct automata theory using Finite Automata
				CO2: Write regular expressions for any pattern
				CO3: Design context free grammar and Pushdown Automata
				CO4: Design Turing machine for computational functions
				CO5: Differentiate between decidable and undecidable problems
18		CS3491	Artificial Intelligence and Machine Learning	CO1: Use appropriate search algorithms for problem solving
				CO2: Apply reasoning under uncertainty
				CO3: Build supervised learning models
				CO4: Build ensembling and unsupervised models
				CO5: Build deep learning neural network models
19		CS3492	Database Management Systems	CO1: Construct SQL Queries using relational algebra
				CO2: Design database using ER model and normalize the database
				CO3: Construct queries to handle transaction processing and maintain consistency of the database
				CO4: Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database
				CO5: Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement
20		CS3401	Algorithms	CO1: Analyze the efficiency of algorithms using various frameworks
				CO2: Apply graph algorithms to solve problems and analyze their efficiency.
				CO3: Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems
				CO4: Use the state space tree method for solving problems.
				CO5: Solve problems using approximation algorithms and randomized algorithms

21		CS3451	Introduction to Operating Systems	CO1 : Analyze various scheduling algorithms and process synchronization.
				CO2 : Explain deadlock prevention and avoidance algorithms.
				CO3 : Compare and contrast various memory management schemes.
				CO4 : Explain the functionality of file systems, I/O systems, and Virtualization
				CO5 : Compare iOS and Android Operating Systems.
22	IV	GE3451	Environmental Sciences and Sustainability	CO1:To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
				CO2:To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
				CO3:To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
				CO4:To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
				CO5:To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.
23		CS3591	Computer Networks	CO 1: Explain the basic layers and its functions in computer networks.
				CO 2: Understand the basics of how data flows from one node to another.
				CO 3: Analyze routing algorithms.
				CO 4: Describe protocols for various functions in the network.
				CO 5: Analyze the working of various application layer protocols.
24		CS3501	Compiler Design	CO1: Understand the techniques in different phases of a compiler.
				CO2: Design a lexical analyser for a sample language and learn to use the LEX tool.
				CO3: Apply different parsing algorithms to develop a parser and learn to use YACC tool
				CO4: Understand semantics rules (SDT), intermediate code generation and run-time environment.
				CO5: Implement code generation and apply code optimization techniques.
25	V	CB3491	Cryptography and Cyber 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 cyber crimes and cyber security
26		CS3551	Distributed Computing	CO1: Explain the foundations of distributed systems
				CO2: Solve synchronization and state consistency problems
				CO3 Use resource sharing techniques in distributed systems
				CO4: Apply working model of consensus and reliability of distributed systems
				CO5: Explain the fundamentals of cloud computing
27		CCS334	Bigdata Analytics	CO1: Describe big data and use cases from selected business domains
				CO2: Explain NoSQL big data management.
				CO3: Install, configure, and run Hadoop and HDFS.
				CO4: Perform map reduce analytics using Hadoop
				CO5: Use Hadoop-related tools such as HBase, Cassandra, Pig, Hive for big data analytics

28	V	CCS335	Cloud Computing	CO1: Understand the design challenges in the cloud.
				CO2: Apply the concept of virtualization and its types.
				CO3: Experiment with virtualization of hardware resources and Docker.
				CO4: Develop and deploy services on the cloud and set up a cloud environment.
				CO5: Explain security challenges in the cloud environment.
29		CCS356	Object Oriented Software Engineering	CO1: Compare various Software Development Lifecycle Models
				CO2: Evaluate project management approaches as well as cost and schedule estimation strategies.
				CO3: Perform formal analysis on specifications.
				CO4: Use UML diagrams for analysis and design.
				CO5: Architect and design using architectural styles and design patterns, and test the system
30		CS3691	Embedded Systems and IOT	CO1: Explain the architecture of embedded processors.
				CO2: Write embedded C programs.
				CO3: Design simple embedded applications.
				CO4: Compare the communication models in IOT
				CO5: Design IoT applications using Arduino/Raspberry Pi /open platform.
31		CCS341	Data Warehousing	CO1: Design data warehouse architecture for various Problems
				CO2: Apply the OLAP Technology
				CO3: Analyse the partitioning strategy
				CO4: Critically analyze the differentiation of various schema for given problem
				CO5: Frame roles of process manager & system manager
32	VI	CCS354	Network Security	CO1: Classify the encryption techniques
				CO2: Illustrate the key management technique and authentication.
				CO3 Evaluate the security techniques applied to network and transport layer
				CO4: Discuss the application layer security standards.
				CO5: Apply security practices for real time applications.
33		CCW331	Business Analytics	CO1: Explain the real world business problems and model with analytical solutions.
				CO2: Identify the business processes for extracting Business Intelligence
				CO3 : Apply predictive analytics for business fore-casting
				CO4: Apply analytics for supply chain and logistics management
				CO5: Use analytics for marketing and sales.
34		CCS352	Multimedia and Animation	CO1: Get the bigger picture of the context of Multimedia and its applications.
				CO2: Use the different types of media elements of different formats on content pages.
				CO3: Author 2D and 3D creative and interactive presentations for different target multimedia applications.
				CO4: Use different standard animation techniques for 2D, 21/2 D, 3D applications.
				CO5: Understand the complexity of multimedia applications in the context of cloud, security,bigdata streaming, social networking, CBIR etc.,
35		MX3089	Instrustrial Safety	CO1: Understand the basic concept of safety
				CO2: Obtain knowledge of Statutory Regulations and standards.
				CO3: Know about the safety Activities of the Working Place.
				CO4: Analyze on the impact of Occupational Exposures and their Remedies
				CO5: Obtain knowledge of Risk Assessment Techniques

36		GE3791	Human Values and Ethics	CO1: Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
				CO2: Practice democratic and scientific values in both their personal and professional life.
				CO3: Find rational solutions to social problems.
				CO4: Behave in an ethical manner in society
				CO5: Practice critical thinking and the pursuit of truth.
37		GE3751	Principles of Management	CO1: Upon completion of the course, students will be able to have clear understanding of managerial functions like planning,
				CO2: Have same basic knowledge on international aspect of management.
				CO3: Ability to understand management concept of organizing.
				CO4: Ability to understand management concept of directing.
				CO5: Ability to understand management concept of controlling.
38	VII	AI3021	IT in Agricultural System	CO1: Understand the applications of IT in remote sensing applications such as Drones etc.
				CO2: Get a clear understanding of how a greenhouse can be automated and its advantages.
				CO3: Apply IT principles and concepts for management of field operations.
				CO4: Get an understanding about weather models, their inputs and applications.
				CO5: Get an understanding of how IT can be used for e-governance in agriculture.
39		OHS352	Project Report Writing	CO1: Write effective project reports.
				CO2: Use statistical tools with confidence.
				CO3: Explain the purpose and intension of the proposed project coherently and with clarity.
				CO4: Create writing texts to suit achieve the intended purpose
				CO5: Master the art of writing winning proposals and projects.
40		CS3711	Summer Internship	CO1: Industry Practices, Processes,Techniques, technology, automation and other core aspects of software industry
				CO2: Analyze, Design solutions to complex business problems
				CO3: Build and deploy solutions for target platform
				CO4: Preparation of Technical reports and presentation
41	VIII	CS3811	Project Work/ Internship	CO1: Gain Domain knowledge and technical skill set required for solving industry / research problems
				CO2: Provide solution architecture, module level designs, algorithms
				CO3: Implement, test and deploy the solution for the target platform
				CO4: Prepare detailed technical report, demonstrate and present the work