SSM INSTITUTE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution)
Dindigul – 624 002

Criteria 3 - Course Outcomes and Program Outcomes

Course Outcomes and CO-PO&PSO Mapping

Branch : Department of Computer Science and Engineering
Regulation : R 2021

Course Outcomes

Course Code	Subject code	Subject Name	Course Outcome No	Course Outcomes
C101	HS3151	Professional English - I	**C101.1**	To use appropriate words in a professional context
			C101.2	To gain understanding of basic grammatical structures and use them in right context.
			C101.3	To read and infer the denotative and connotative meanings of technical texts
			C101.4	To read and interpret information presented in tables, charts and other graphic forms
			C101.5	To write definitions, descriptions, narrations and essays on various topics
C102	MA3151	Matrices and Calculus	**C102.1**	Use the matrix algebra methods for solving practical problems.
			C102.2	Apply differential calculus tools in solving various application problems.
			C102.3	Able to use differential calculus ideas on several variable functions.
			C102.4	Apply different methods of integration in solving practical problems.
			C102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.
C103	PH3151	Engineering Physics	**C103.1**	Understand the importance of mechanics.
			C103.2	Express their knowledge in electromagnetic waves.
			C103.3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
			C103.4	Understand the importance of quantum physics.
			C103.5	Comprehend and apply quantum mechanical principles towards the formation of energy bands.
C104	CY3151	Engineering Chemistry	**C104.1**	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
			C104.2	To identify and apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
			C104.3	To apply the knowledge of phase rule and composites for material selection requirements.
			C104.4	To recommend suitable fuels for engineering processes and applications.
			C104.5	To recognize different forms of energy resources and apply them for suitable applications in energy sectors.

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C105	GE3151	Problem Solving and Python Programming	**C105.1**	Develop algorithmic solutions to simple computational problems.
			C105.2	Develop and execute simple Python programs.
			C105.3	Write simple Python programs using conditionals and loops for solving problems.
			C105.4	Decompose a Python program into functions.
			C105.5	Represent compound data using Python lists, tuples, dictionaries etc.
			C105.6	Read and write data from/to files in Python programs.
C106	GE3171	Problem Solving and Python Programming Laboratory	**C106.1**	Develop algorithmic solutions to simple computational problems
			C106.2	Develop and execute simple Python programs.
			C106.3	Implement programs in Python using conditionals and loops for solving problems.
			C106.4	Deploy functions to decompose a Python program.
			C106.5	Process compound data using Python data structures.
			C106.6	Utilize Python packages in developing software applications.
C107	BS3171	Physics Laboratory	**C107.1**	Understand the functioning of various physics laboratory equipment.
			C107.2	Use graphical models to analyze laboratory data.
			C107.3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.
			C107.4	Access, process and analyze scientific information.
			C107.5	Solve problems individually and collaboratively.
C107	BS3171	Chemistry Laboratory	**C107.1**	To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.
			C107.2	To determine the amount of metal ions through volumetric and spectroscopic techniques
			C107.3	To analyse and determine the composition of alloys.
			C107.4	To learn simple method of synthesis of nanoparticles
			C107.5	To quantitatively analyse the impurities in solution by electro analytical techniques
C108	HS3251	Professional English - II	**C108.1**	To compare and contrast products and ideas in technical texts.
			C108.2	To identify and report cause and effects in events, industrial processes through technical texts
			C108.3	To analyse problems in order to arrive at feasible solutions and communicate them in the written format.
			C108.4	To present their ideas and opinions in a planned and logical manner
			C108.5	To draft effective resumes in the context of job search.

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C109	MA3251	Statistics and Numerical Methods	**C109.1**	Apply the concept of testing of hypothesis for small and large samples in real life problems.
			C109.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
			C109.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
			C109.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
			C109.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.
C110	PH3256	Physics for Information science	**C110.1**	Gain knowledge on classical and quantum electron theories, and energy band structures
			C110.2	Acquire knowledge on basics of semiconductor physics and its applications in various devices
			C110.3	Get knowledge on magnetic properties of materials and their applications in data storage,
			C110.4	Have the necessary understanding on the functioning of optical materials for optoelectronics
			C110.5	Understand the basics of quantum structures and their applications and basics of quantum computing
C111	BE3251	Basic Electrical and Electronics Engineering	**C111.1**	Compute the electric circuit parameters for simple problems
			C111.2	Explain the working principle and applications of electrical machines
			C111.3	Analyze the characteristics of analog electronic devices
			C111.4	Explain the basic concepts of digital electronics
			C111.5	Explain the operating principles of measuring instruments
C112	GE3251	Engineering Graphics	**C112.1**	Use BIS conventions and specifications for engineering drawing.
			C112.2	Construct the conic curves, involutes and cycloid.
			C112.3	Solve practical problems involving projection of lines.
			C112.4	Draw the orthographic, isometric and perspective projections of simple solids.
			C112.5	Draw the development of simple solids.

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C113	CS3251	Programming in C	**C113.1**	Demonstrate knowledge on C Programming constructs
			C113.2	Develop simple applications in C using basic constructs
			C113.3	Design and implement applications using arrays and strings
			C113.4	Develop and implement modular applications in C using functions.
			C113.5	Develop applications in C using structures and pointers.
			C113.6	Design applications using sequential and random access file processing.
C114	GE3271	Engineering Practices Laboratory	**C114.1**	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work.
			C114.2	Wire various electrical joints in common household electrical wire work.
			C114.3	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipment's; Make a tray out of metal sheet using sheet metal work.
			C114.4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
C115	CS3271	Programming in C Laboratory	**C115.1**	Demonstrate knowledge on C programming constructs.
			C115.2	Develop programs in C using basic constructs.
			C115.3	Develop programs in C using arrays.
			C115.4	Develop applications in C using strings, pointers, functions
			C115.5	Develop applications in C using structures.
			C115.6	Develop applications in C using file processing
C201	MA3354	Discrete Mathematics	**C201.1**	Have knowledge of the concepts needed to test the logic of a program.
			C201.2	Have an understanding in identifying structures on many levels.
			C201.3	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
			C201.4	Be aware of the counting principles.
			C201.5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields

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C202	CS3351	Digital Principles and Computer Organization	**C202.1**	Design various combinational digital circuits using logic gates
			C202.2	Design sequential circuits and analyze the design procedures
			C202.3	State the fundamentals of computer systems and analyze the execution of an instruction
			C202.4	Analyze different types of control design and identify hazards
			C202.5	Identify the characteristics of various memory systems and I/O communication
C203	CS3352	Foundations of Data Science	**C203.1**	Define the data science process
			C203.2	Understand different types of data description for data science process
			C203.3	Gain knowledge on relationships between data
			C203.4	Use the Python Libraries for Data Wrangling
			C203.5	Apply visualization Libraries in Python to interpret and explore data
C204	CS3301	Data Structures	**C204.1**	Define linear and non-linear data structures.
			C204.2	Implement linear and non–linear data structure operations.
			C204.3	Use appropriate linear/non–linear data structure operations for solving a given problem.
			C204.4	Apply appropriate graph algorithms for graph applications
			C204.5	Analyze the various searching and sorting algorithms.
C205	CS3391	Object Oriented Programming	**C205.1**	Apply the concepts of classes and objects to solve simple problems
			C205.2	Develop programs using inheritance, packages and interfaces
			C205.3	Make use of exception handling mechanisms and multithreaded model to solve real world problems
			C205.4	Build Java applications with I/O packages, string classes, Collections and generics concepts
			C205.5	Integrate the concepts of event handling and JavaFX components and controls for developing GUI based applications
C206	CS3311	Data Structures Laboratory	**C206.1**	Implement Linear data structure algorithms.
			C206.2	Implement applications using Stacks and Linked lists
			C206.3	Implement Binary Search tree and AVL tree operations
			C206.4	Implement graph algorithms
			C206.5	Analyze the various searching and sorting algorithms

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C207	CS3381	Object Oriented Programming Laboratory	**C207.1**	Design and develop java programs using object oriented programming concepts
			C207.2	Develop simple applications using object oriented concepts such as package, exceptions
			C207.3	Implement multithreading, and generics concepts
			C207.4	Create GUIs and event driven programming applications for real world problems
			C207.5	Implement and deploy web applications using Java
C208	CS3361	Data Science Laboratory	**C208.1**	Make use of the python libraries for data science
			C208.2	Make use of the basic Statistical and Probability measures for data science.
			C208.3	Perform descriptive analytics on the benchmark data sets.
			C208.4	Perform correlation and regression analytics on standard data sets
			C208.5	Present and interpret data using visualization packages in Python.
C209	CS3452	Theory of Computation	**C209.1**	Construct automata theory using Finite Automata
			C209.2	Write regular expressions for any pattern
			C209.3	Design context free grammar and Pushdown Automata
			C209.4	Design Turing machine for computational functions
			C209.5	Differentiate between decidable and undecidable problems
C210	CS3491	Artificial Intelligence and Machine Learning	**C210.1**	Use appropriate search algorithms for problem solving
			C210.2	Apply reasoning under uncertainty
			C210.3	Build supervised learning models
			C210.4	Build ensembling and unsupervised models
			C210.5	Build deep learning neural network models
C211	CS3492	Database Management Systems	**C211.1**	Construct SQL Queries using relational algebra
			C211.2	Design database using ER model and normalize the database
			C211.3	Construct queries to handle transaction processing and maintain consistency of the database
			C211.4	Compare and contrast various indexing strategies and apply the knowledge to tune the performance of the database
			C211.5	Appraise how advanced databases differ from Relational Databases and find a suitable database for the given requirement

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C212	CS3401	Algorithms	**C212.1**	Analyze the efficiency of algorithms using various frameworks
			C212.2	Apply graph algorithms to solve problems and analyze their efficiency.
			C212.3	Make use of algorithm design techniques like divide and conquer, dynamic programming and greedy techniques to solve problems
			C212.4	Use the state space tree method for solving problems.
			C212.5	Solve problems using approximation algorithms and randomized algorithms
C213	CS3451	Introduction to Operating Systems	**C213.1**	Analyze various scheduling algorithms and process synchronization.
			C213.2	Explain deadlock prevention and avoidance algorithms.
			C213.3	Compare and contrast various memory management schemes
			C213.4	Explain the functionality of file systems, I/O systems, and Virtualization
			C213.5	Compare iOS and Android Operating Systems
C214	GE3451	Environmental Sciences and Sustainability	**C214.1**	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.
			C214.2	To identify the causes, effects of environmental pollution and natural disasters and contribute to the preventive measures in the society.
			C214.3	To identify and apply the understanding of renewable and non- renewable resources and contribute to the sustainable measures to preserve them for future generations
			C214.4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development
			C214.5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization
C215	CS3461	Operating Systems Laboratory	**C215.1**	Define and implement UNIX Commands.
			C215.2	Compare the performance of various CPU Scheduling Algorithms
			C215.3	Compare and contrast various Memory Allocation Methods.
			C215.4	Define File Organization and File Allocation Strategies
			C215.5	Implement various Disk Scheduling Algorithms

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C216	CS3481	Database Management Systems Laboratory	**C216.1**	Create databases with different types of key constraints.
			C216.2	Construct simple and complex SQL queries using DML and DCL commands.
			C216.3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development.
			C216.4	Create an XML database and validate with meta-data (XML schema)
			C216.5	Create and manipulate data using NOSQL database.
C301	CS3591	Computer Networks	**C301.1**	Explain the basic layers and its functions in computer networks.
			C301.2	Understand the basics of how data flows from one node to another.
			C301.3	Analyze routing algorithms
			C301.4	Describe protocols for various functions in the network
			C301.5	Analyze the working of various application layer protocols
C302	CS3501	Compiler Design	**C302.1**	Understand the techniques in different phases of a compiler.
			C302.2	Design a lexical analyser for a sample language and learn to use the LEX tool
			C302.3	Apply different parsing algorithms to develop a parser and learn to use YACC tool
			C302.4	Understand semantics rules (SDT), intermediate code generation and run-time environment
			C302.5	Implement code generation and apply code optimization techniques
C303	CB3491	Cryptography and Cyber Security	**C303.1**	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
			C303.2	Apply the different cryptographic operations of symmetric cryptographic algorithms
			C303.3	Apply the different cryptographic operations of public key cryptography
			C303.4	Apply the various Authentication schemes to simulate different applications
			C303.5	Understand various cyber crimes and cyber security
C304	CS3551	Distributed Computing	**C304.1**	Explain the foundations of distributed systems
			C304.2	Solve synchronization and state consistency problems
			C304.3	Use resource sharing techniques in distributed systems
			C304.4	Apply working model of consensus and reliability of distributed systems
			C304.5	Explain the fundamentals of cloud computing

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C305	CCS375	Web Technologies	**C305.1**	Construct a basic website using HTML and Cascading Style Sheets
			C305.2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms
			C305.3	Develop server side programs using Servlets and JSP.
			C305.4	Construct simple web pages in PHP and to represent data in XML format
			C305.5	Develop interactive web applications.
C306	CCS334	Big Data Analytics	**C306.1**	Describe big data and use cases from selected business domains.
			C306.2	Explain NoSQL big data management
			C306.3	Install, configure, and run Hadoop and HDFS
			C306.4	Perform map-reduce analytics using Hadoop
			C306.5	Use Hadoop-related tools such as HBase, Cassandra, Pig, and Hive for big data analytics
C307	CCS356	Object Oriented Software Engineering	**C307.1**	Compare various Software Development Lifecycle Models
			C307.2	Evaluate project management approaches as well as cost and schedule estimation strategies
			C307.3	Perform formal analysis on specifications
			C307.4	Use UML diagrams for analysis and design
			C307.5	Architect and design using architectural styles and design patterns, and test the system
C308	CS3691	Embedded Systems and IoT	**C308.1**	Explain the architecture of embedded processors.
			C308.2	Write embedded C programs
			C308.3	Design simple embedded applications
			C308.4	Compare the communication models in IOT
			C308.5	Design IoT applications using Arduino/Raspberry Pi /open platform
C309	CCS332	App Development	**C309.1**	Develop Native applications with GUI Components.
			C309.2	Develop hybrid applications with basic event handling
			C309.3	Implement cross-platform applications with location and data storage capabilities
			C309.4	Implement cross platform applications with basic GUI and event handling.
			C309.5	Develop web applications with cloud database access

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C310	CCS370	UI and UX Design	**C310.1**	Build UI for user Applications
			C310.2	Evaluate UX design of any product or application
			C310.3	Demonstrate UX Skills in product development
			C310.4	Implement Sketching principles
			C310.5	Create Wireframe and Prototype
C311	CCS366	Software Testing and Automation	**C311.1**	Understand the basic concepts of software testing and the need for software testing
			C311.2	Design Test planning and different activities involved in test planning
			C311.3	Design effective test cases that can uncover critical defects in the application
			C311.4	Carry out advanced types of testing
			C311.5	Automate the software testing using Selenium and Test NG
C312	OEE351	Renewable Energy System	**C312.1**	Attained knowledge about various renewable energy technologies
			C312.2	Ability to understand and design a PV system.
			C312.3	Understand the concept of various wind energy system
			C312.4	Gained knowledge about various possible hybrid energy systems
			C312.5	Attained knowledge about various application of renewable energy technologies
C401	GE3791	Human Values and Ethics	**C401.1**	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
			C401.2	Practice democratic and scientific values in both their personal and professional life
			C401.3	Find rational solutions to social problems
			C401.4	Behave in an ethical manner in society
			C401.5	Practice critical thinking and the pursuit of truth
C402	GE3751	Principles of Management	**C402.1**	Upon completion of the course, students will be able to have clear understanding of managerial functions like planning, organizing, staffing, leading & controlling.
			C402.2	Have same basic knowledge on international aspect of management
			C402.3	Ability to understand management concept of organizing
			C402.4	Ability to understand management concept of directing
			C402.5	Ability to understand management concept of controlling

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C403	OHS351	English for Competitive Examinations	**C403.1**	Expand their vocabulary and gain practical techniques to read and comprehend a wide range of texts with the emphasis required
			C403.2	Identify errors with precision and write with clarity and coherence
			C403.3	Understand the importance of task fulfilment and the usage of task-appropriate vocabulary
			C403.4	Communicate effectively in group discussions, presentations and interviews
			C403.5	Write topic based essays with precision and accuracy
C404	OHS352	Project Report Writing	**C404.1**	Write effective project reports.
			C404.2	Use statistical tools with confidence
			C404.3	Explain the purpose and intension of the proposed project coherently and with clarity
			C404.4	Create writing texts to suit achieve the intended purpose
			C404.5	Master the art of writing winning proposals and projects
C405	CS3811	Project Work	**C405.1**	Gain Domain knowledge and technical skill set required for solving industry / research problems
			C405.2	Provide solution architecture, module level designs, algorithms
			C405.3	Implement, test and deploy the solution for the target platform
			C405.4	Prepare detailed technical report, demonstrate and present the work
			C405.5	On Completion of the project work students will be in a position to find solution by formulating proper methodology.