MEENAKSHI COLLEGE OF ENGINEERING
No-12, Vembuli Amman Koil Street, West K.K Nagar,
Chennai - 600 078

DEPARTMENT OF INFORMATION TECHNOLOGY
REGULATION-2021
COURSE OUTCOMES

SEMESTER-1

Course Name: HS3152 **/** Professional English

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
CO5	To Compound & Complex Sentences. Vocabulary - Cause & Effect Expressions – Content vs Function word

Course Name: 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

Course Name: 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

Course Name: 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

Course Name: GE3152/ Heritage Tamils

CO1	Discuss the Tamil Language and Literature
CO2	Discuss about the paintings modern Art Sculpture
CO3	Illustrate the folk martial arts
CO4	Understand the Sangam age through Tamil Literature
CO5	Discuss the contribution of Tamil Literature in Indian Civilization

Course Name: 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 program

PRATICALS

Course Name: GE3171 **/** Python Solving and python Programming Laboratory

CO1	Develop algorithmic solutions to simple computational problems
CO2	Develop and execute simple Python programs
CO3	Implement programs in Python using conditionals and loops for solving Problems
CO4	Deploy functions to decompose a Python program
CO5	Process compound data using Python data structures
CO6	Utilize Python packages in developing software applications

Course Name: BS3171 **/** Physics and Chemistry Laboratory

CO1	Understand the functioning of various physics laboratory equipment
CO2	Use graphical models to analyze laboratory data
CO3	Use mathematical models as a medium for quantitative reasoning and describing physical reality
CO4	Access, process and analyze scientific information
CO5	Solve problems individually and collaboratively

SEMESTER-2

THEORY

Course Name: 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 analyze 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

Course Name: 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

Course Name: 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 opto electronics
CO5	understand the basics of quantum structures and their applications and basics of quantum computing

Course Name: 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

Course Name: 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

Course Name: GE3252/Tamils and technology

CO1	Learn about weaving and ceramic methods in Sangam period
CO2	Experience about art and sculpture in Sangam period
CO3	Make and use of metals in Sangam period
CO4	Apply the knowledge on water management in Sangam Period
CO5	Implementing the digitization in Tamil

Course Name: 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	Design applications using sequential and random access file processing

PRATICALS

Course Name: GE3271 **/** Engineering Practices Laboratory

CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make points in wood materials used in common household wood work
CO2	Wire various electrical joints in common household electrical wire work
CO3	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
CO4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB

Course Name: CS3271 **/** Programming in C Laboratory

CO1	Demonstrate knowledge on C programming constructs
CO2	Develop programs in C using basic constructs
CO3	Develop programs in C using arrays
C04	Develop applications in C using strings, pointers, functions
CO5	Develop applications in C using structures
CO6	Develop applications in C using file processing

SEMESTER-3

THEORY

Course Name: 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
CO4	Be aware of the counting principles
CO5	Be exposed to concepts and properties of algebraic structures such as groups, rings and fields

Course Name: 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

Course Name: 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

Course Name: CD3291 **/** Data Structures and Algorithms

CO1	Explain abstract data types
CO2	Design, implement, and analyze linear data structures, such as lists, queues, and stacks, according to the needs of different applications
CO3	Design, implement, and analyze efficient tree structures to meet requirements such as searching, indexing, and sorting
CO4	Model problems as graph problems and implement efficient graph algorithms to solve them
CO5	Binary and linear search.

Course Name: 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

PRATICALS

Course Name: CD3281 **/** Data Structures and Algorithms Laboratory

CO1	Implement ADTs as Python classes
CO2	Design, implement, and analyse linear data structures, such as lists, queues, and stacks, according to the needs of different applications
CO3	Design, implement, and analyse efficient tree structures to meet requirements such as searching, indexing, and sorting
CO4	Model problems as graph problems and implement efficient graph algorithms to solve them
C05	Model problems binary and linear search

Course Name: CS3381 **/** Object Oriented Programming Laboratory

CO1	Design and develop java programs using object-oriented programming Concepts
CO2	Develop simple applications using object-oriented concepts such as package, Exceptions
CO3	Implement multithreading, and generics concepts
CO4	Create GUIs and event driven programming applications for real world Problems
CO5	Implement and deploy web applications using Java

Course Name: CS3361 **/** Data Science Laboratory

CO1	Make use of the python libraries for data science
CO2	Make use of the basic Statistical and Probability measures for data science
CO3	Perform descriptive analytics on the benchmark data set
CO4	Perform correlation and regression analytics on standard data sets
CO5	Present and interpret data using visualization packages in Python

SEMESTER-4

THEORY

Course Name: 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

Course Name: 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

Course Name: 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

Course Name: IT3401 **/** Web Essentials

CO1	Apply JavaScript, HTML and CSS effectively to create interactive and dynamic websites
CO2	Create simple PHP scripts
CO3	Design and deploy simple webapplications
CO4	Create simple database applications
CO5	Handle multimedia components

Course Name: 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

Course Name: 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

PRATICALS

Course Name: CS3461 **/** Operating Systems Laboratory

CO1	Define and implement UNIX Commands
CO2	Compare the performance of various CPU Scheduling Algorithms
CO3	Compare and contrast various Memory Allocation Methods
CO4	Define File Organization and File Allocation Strategies
CO5	Implement various Disk Scheduling Algorithms

Course Name: CS3481 **/** Database Management Systems Laboratory

CO1	Create databases with different types f key constraints
CO2	Construct simple and complex SQL queries using DML and DCL commands
CO3	Use advanced features such as stored procedures and triggers and incorporate in GUI based application development
CO4	Create an XML database and validate with meta-data (XML schema)
CO5	Create and manipulate data using NOSQL database

SEMESTER-5

THEORY

Course Name: CS3591 **/** Computer Networks

CO1	Explain the basic layers and its functions in computer networks
CO2	Understand the basics of how data flows from one node to another
CO3	Analyze routing algorithms
CO4	Describe protocols for various functions in the network
CO5	Analyze the working of various application layer protocols

Course Name: IT3501 **/** Full Stack Web Development

CO1	Understand the various stacks available for web application development
CO2	Use Node.js for application Development
CO3	Develop applications with MongoDB
CO4	Use the features of Angular and Express
CO5	Develop React applications

Course Name: 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

Course Name: 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

PROFESSIONAL ELECTIVES

Course Name: 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	Develop and deploy services on the cloud and set up a cloud environment

Course Name: 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

MANDATORY COURSE

Course Name: MX3084/Disaster risk reduction and management

CO1	To impart knowledge on the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
CO2	To enhance understanding on Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction
CO3	To develop disaster response skills by adopting relevant tools and technology
CO4	Enhance awareness of institutional processes for Disaster response in the Country
CO5	Develop rudimentary ability to respond to their surroundings with potential Disaster response in areas

PRATICALS

Course Name: IT3511 / Full Stack Web Development Laboratory

CO1	Design full stack applications with clear understanding of user interface, business logic and data storag.
CO2	Design and develop user interface screens
CO3	Implement the functional requirements using appropriate tool
CO4	Design and develop database based on the requirements
CO5	Integrate all the necessary components of the application

SEMESTER-6

THEORY

Course Name: 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

PROFESSIONAL ELECTIVES:

Course Name: CCS366 /Software Testing and Automation

CO1	Understand the basic concepts of software testing and the need for software Testing
CO2	Design Test planning and different activities involved in test planning
CO3	Design effective test cases that can uncover critical defects in the application
CO4	Carry out advanced types of testing
CO5	Automate the software testing using Selenium and Testing

Course Name:CCS332/App Development

CO1	Develop Native applications with GUI Components
CO2	Develop hybrid applications with basic event handling
CO3	Implement cross-platform applications with location and data storage Capabilities
CO4	Implement cross platform applications with basic GUI and event handling
CO5	Develop web applications with cloud database access

Course Name: CCS374 /Web Application Security

CO1	Understanding the basic concepts of web application security and the need for it
CO2	Be acquainted with the process for secure development and deployment of web applications
CO3	Acquire the skill to design and develop Secure Web Applications that use Secure APIs
CO4	Be able to get the importance of carrying out vulnerability assessment and penetration testing
CO5	Acquire the skill to think like a hacker and to use hackers tool sets

Course Name: CCS334 / Big Data Analysis

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, and Hive for big data Analytic

MANDATORY COURSE:

Course Name: MX3086 / History of science and technology in India

CO1	History of Moral judgment
CO2	Understand of how societies are shaped by philosophy
CO3	they relate to fulfilling human goals
CO4	desires with some case studies of how different attempts have been made in the past
CO5	Social implications of new technologies like the Information Technology and Biotechnology

PRATICALS

Course Name: IT3681 / Mobile Applications Development Laboratory

CO1	Design and build simple mobile applications supporting multiple platform.
CO2	Apply various programming techniques and patterns to build mobile Applications
CO3	Build real-time mobile applications for society/environment
CO4	Build gaming and multimedia based mobile applications
CO5	Build AI based mobile applications for society/environment following ethical Practices

SEMESTER-7

THEORY

Course Name: 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

Course Name: GE3752 /Total Quality Management

CO1	Ability to apply TQM concepts in a selected enterprise
CO2	Ability to apply TQM principles in a selected enterprise
CO3	Ability to understand Six Sigma and apply Traditional tools, New tools, Benchmarking and FMEA
CO4	Ability to understand Taguchi's Quality Loss Function, Performance Measures and apply QFD, TPM, COQ and BPR
CO5	Ability to apply QMS and EMS in any organization

Course Name: 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

SUMMER INTERNSHIP

Course Name: IT3711 / 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

SEMESTER 8

Course Name: IT3811/Project 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