St.Mother Theresa Engineering College
Department of Computer Science and Engineering
Regulation-2021
Course Outcomes

Semester 1		
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
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.
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.
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.

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.
GE3171 PROBLEM 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.
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.
	CO6	To analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.
	CO7	To determine the amount of metal ions through volumetric and spectroscopic techniques
	CO8	To analyse and determine the composition of alloys.
	CO9	To learn simple method of synthesis of nanoparticles
	CO10	To quantitatively analyse the impurities in solution by electroanalytical techniques
GE3172 ENGLISH LABORATORY	**CO1**	To listen to and comprehend general as well as complex academic information
	CO2	To listen to and understand different points of view in a discussion
	CO3	To speak fluently and accurately in formal and informal communicative contexts
	CO4	To describe products and processes and explain their uses and purposes clearly and accurately
	CO5	To express their opinions effectively in both formal and informal discussions

Semester 2		
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.
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.
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
BE3251 BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	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.

GE3251 ENGINEERING GRAPHICS	**CO1**	Summarize the importance of environment, biodiversity, ecosystem and how to solve environmental related problems.
	CO2	Describe the causes, effect and control measures of air pollution, water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with their relevant case studies.
	CO3	Discuss the various renewable and non-renewable resources and energy conservation processes.
	CO4	Explain the social issues and solutions for sustainable environment with relevant Acts and case studies.
	CO5	Review the impact of human population in the environment and its remedial measures.
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.
GE3271 ENGINEERING PRACTICES LABORATORY	**CO1**	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.
	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 equipments; 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
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.
	CO4	Develop applications in C using strings, pointers, functions.
	CO5	Develop applications in C using structures.
GE3272 COMMUNICATION LABORATORY	**CO1**	Speak effectively in group discussions held in a formal/semi formal contexts.
	CO2	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions
	CO3	Write emails, letters and effective job applications.
	CO4	Write critical reports to convey data and information with clarity and precision
	CO5	Give appropriate instructions and recommendations for safe execution of tasks

		Semester 3
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.
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
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
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.
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
CS3311 DATA STRUCTURES LABORATORY	CO1	Implement Linear data structure algorithms.
	CO2	Implement applications using Stacks and Linked lists
	CO3	Implement Binary Search tree and AVL tree operations.
	CO4	Implement graph algorithms.
	CO5	Analyze the various searching and sorting algorithms
	CO1	Design and develop java programs using object oriented programming concepts

Course	CO	Outcome
CS3381 OBJECT ORIENTED PROGRAMMING LABORATORY	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
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 sets.
	CO4	Perform correlation and regression analytics on standard data sets
	CO5	Present and interpret data using visualization packages in Python.
GE3361 PROFESSIONAL DEVELOPMENT	CO1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
	CO2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
	CO3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.
Semester 4		
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
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
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.
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
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.
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.
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
CS3481 DATABASE MANAGEMENT SYSTEMS LABORATORY	CO1	Create databases with different types of 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		
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.
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.
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.
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
Semester 6		
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
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.
Semester 7		
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.

Semester 8		
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
Electives		
CCS346 EXPLORATORY DATA ANALYSIS	CO1	Understand the fundamentals of exploratory data analysis.
	CO2	Implement the data visualization using Matplotlib.
	CO3	Perform univariate data exploration and analysis.
	CO4	Apply bivariate data exploration and analysis.
	CO5	Use Data exploration and visualization techniques for multivariate and time series data.
CCS334 BIG DATA 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, and Hive for big data analytics.
CCS375 WEB TECHNOLOGIES	CO1	Construct a basic website using HTML and Cascading Style Sheets
	CO2	Build dynamic web page with validation using Java Script objects and by applying different event handling mechanisms.
	CO3	Develop server side programs using Servlets and JSP.
	CO4	Construct simple web pages in PHP and to represent data in XML format.
	CO5	Develop interactive web applications.
CCS370 UI AND UX DESIGN	CO1	Build UI for user Applications
	CO2	Evaluate UX design of any product or application
	CO3	Demonstrate UX Skills in product development
	CO4	Implement Sketching principles
	CO5	Create Wireframe and Prototype
CCS344 ETHICAL HACKING	CO1	To express knowledge on basics of computer based vulnerabilities
	CO2	To gain understanding on different foot printing, reconnaissance and scanning methods.
	CO3	To demonstrate the enumeration and vulnerability analysis methods
	CO4	To gain knowledge on hacking options available in Web and wireless applications.
	CO5	To acquire knowledge on the options for network protection.
	CO6	To use tools to perform ethical hacking to expose the vulnerabilities.
	CO1	Have knowledge on digital forensics.

CCS343 DIGITAL AND MOBILE FORENSICS	**CO2**	Know about digital crime and investigations.
	CO3	Be forensic ready.
	CO4	Investigate, identify and extract digital evidence from iOS devices.
	CO5	Investigate, identify and extract digital evidence from Android devices.
CCS339 CRYPTOCURRENCY AND BLOCKCHAIN TECHNOLOGIES	**CO1**	Understand emerging abstract models for Blockchain Technology
	CO2	Identify major research challenges and technical gaps existing between theory and practice in the crypto currency domain.
	CO3	It provides conceptual understanding of the function of Blockchain as a method of securing distributed ledgers, how consensus on their contents is achieved, and the new applications that they enable.
	CO4	Apply hyperledger Fabric and Ethereum platform to implement the Block chain Application.
CCW332 DIGITAL MARKETING	**CO1**	To examine and explore the role and importance of digital marketing in today's rapidly changing business environment..
	CO2	To focuses on how digital marketing can be utilized by organizations and how its effectiveness can be measured.
	CO3	To know the key elements of a digital marketing strategy.
	CO4	To study how the effectiveness of a digital marketing campaign can be measured
	CO5	To demonstrate advanced practical skills in common digital marketing tools such as SEO, SEM, Social media and Blogs.