# MEENAKSHI COLLEGE OF ENGINEERING

**12, Vembuli Amman Koil Street, West K.K Nagar,**
**Chennai – 78**

## DEPARTMENT OF COMPUTER APPLICATIONS

## REGULATION 2021

## COURSE OUTCOMES

### SEMESTER I

**Course Name: Applied Probability And Statistics For Computer Science Engineers (MA4151)**

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| **CO1** | Apply the concepts of Linear Algebra to solve practical problems. |
| **CO2** | Use the ideas of probability and random variables in solving engineering problems. |
| **CO3** | Be familiar with some of the commonly encountered two dimension random variables and beequipped for a possible extension to multivariate analysis. |
| **CO4** | Use statistical tests in testing hypothesis on data. |
| **CO5** | Develop critical thinking based on empirical evidence and the scientific approach toknowledge development. |

**Course Name: Research Methodology And IPR (RM4151)**

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| **CO1** | Formulate and Design research problem |
| **CO2** | Understand and Comprehend the Data Collection Methods |
| **CO3** | Perform Data analysis and acquire Insights |
| **CO4** | Understand IPR and follow research ethics |
| **CO5** | Understand and Practice Drafting and filing a Patent in research and development |

**Course Name: Advanced Data Structures And Algorithms (MC4101)**

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|---|---|
| **CO1** | Design data structures and algorithms to solve computing problems |
| **CO2** | Choose and implement efficient data structures and apply them to solve problems. |
| **CO3** | Design algorithms using graph structure and various string-matching algorithms to solve real-life problems. |
| **CO4** | Design one's own algorithm for an unknown problem. |
| **CO5** | Apply suitable design strategy for problem solving. |

**Course Name: Object Oriented Software Engineering (MC4102)**

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| **CO1** | Design object oriented software using appropriate process models. |
| **CO2** | Differentiate software processes under waterfall and agile methodology. |
| **CO3** | Design and Develop UML diagrams for software projects. |
| **CO4** | Apply Design Patterns for a software process. |
| **CO5** | Categorize testing methods and compare different testing tools for software processes. |
| **CO6** | Analyze object oriented metrics and quality for software engineering processes. |

**Course Name: Python Programming (MC4103)**

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| **CO1** | Develop algorithmic solutions to simple computational problems |
| **CO2** | Represent compound data using Python lists, tuples and dictionaries. |
| **CO3** | Read and write data from/to files in Python Programs |
| **CO4** | Structure simple Python programs using libraries, modules etc. |
| **CO5** | Structure a program by bundling related properties and behaviors into individual objects. |

**Course Name: Fundamentals Of Accounting (MC4104)**

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| **CO1** | Able to understand the basic concepts of Accounting standards. |
| **CO2** | Able to understand the process of maintaining Accounts in an organization. |
| **CO3** | Helps to understand and calculating the financial position of an organization. |
| **CO4** | Helps to understand Financial Management concepts and its components. |
| **CO5** | It helps to understand the importance of BRS and generation of various financial reports |

**Course Name: Advanced Data Structures And Algorithms Laboratory (MC4111)**

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|---|---|
| **CO1** | Design and implement basic and advanced data structures extensively |
| **CO2** | Design algorithms using graph structures |
| **CO3** | Design and develop efficient algorithms with minimum complexity using design techniques |
| **CO4** | Develop programs using various algorithms. |
| **CO5** | Choose appropriate data structures and algorithms, understand the ADT/libraries, and use it to design algorithms for a specific problem. |

**Course Name: Python Programming Laboratory (MC4112)**

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| **CO1** | Apply the Python language syntax including control statements, loops and functions to solve awide variety of problems in mathematics and science. |
| **CO2** | Use the core data structures like lists, dictionaries, tuples and sets in Python to store, process andsort the data |
| **CO3** | Create files and perform read and write operations |
| **CO4** | Illustrate the application of python libraries. |

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| **CO5** | Handle exceptions and create classes and objects for any real time applications |

**Course Name: Communication Skills Enhancement – I (MC4113)**

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| **CO1** | Listen and comprehend lectures in English |
| **CO2** | Articulate well and give presentations clearly |
| **CO3** | Participate in Group Discussions successfully |
| **CO4** | Communicate effectively in formal and informal writing |
| **CO5** | Write proficient essays and emails |

**Course Name: Data Structures And Algorithms (BX4001)**

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| **CO1** | Analyze algorithms and determines their time complexity. |
| **CO2** | Understand the concepts of data types, data structures and linear structures |
| **CO3** | Apply data structures to solve various problems |
| **CO4** | Apply different sorting, searching and hashing algorithms. |
| **CO5** | Understand non-linear data structures |

**Course Name: Problem Solving And Programming In C (BX4002)**

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| **CO1** | Able to design a computational solution for a given problem. |
| **CO2** | Able to break a problem into logical modules that can be solved (programmed). |
| **CO3** | Able to transform a problem solution into programs involving programming constructs. |
| **CO4** | To write programs using structures, strings, arrays, pointers and files for solving complexcomputational problems. |
| **CO5** | Able to introduce modularity using functions and pointers which permit ad hoc runtimepolymorphism. |

**SEMESTER II**

**Course Name: Full Stack Web Development (MC4201)**

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| **CO1** | Write client side scripting HTML, CSS and JS. |
| **CO2** | Implement and architect the server side of the web application. |
| **CO3** | Implement Web Application using NodeJS. |
| **CO4** | Architect NoSQL databases with MongoDB. |
| **CO5** | Implement a full-stack Single Page Application using React, NodeJS and MongoDB anddeploy on Cloud. |

**Course Name: Advanced Database Technology (MC4202)**

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| **CO1** | Design a distributed database system and execute distributed queries. |
| **CO2** | Manage Spatial and Temporal Database systems and implement it in corresponding applications. |
| **CO3** | Use NoSQL database systems and manipulate the data associated with it. |
| **CO4** | Design XML database systems and validate with XML schema. |
| **CO5** | Apply knowledge of information retrieval concepts on web databases. |

**Course Name: Cloud Computing Technologies (MC4203)**

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|---|---|
| **CO1** | Use Distributed systems in Cloud Environment. |
| **CO2** | Articulate the main concepts, key technologies, strengths and limitations of Cloud computing. |
| **CO3** | Identify the Architecture, Infrastructure and delivery models of Cloud computing. |
| **CO4** | Install, choose and use the appropriate current technology for the implementation ofCloud. |
| **CO5** | Adopt Microservices and DevOps in Cloud environments. |

**Course Name: Mobile Application Development (MC4204)**

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| **CO1** | Understand the basics of mobile application development frameworks and tools. |
| **CO2** | Develop a UI for mobile applications. |
| **CO3** | Design mobile applications that manage memory dynamically. |
| **CO4** | Build applications based on mobile OS like Android, iOs. |
| **CO5** | Build location based services. |

**Course Name: Cyber Security (MC4205)**

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| **CO1** | Develop a set of risk and security requirements to ensure that there are no gaps in anorganization's security practices. |
| **CO2** | Achieve management, operational and technical means for effective cyber security. |
| **CO3** | Audit and monitor the performance of cyber security controls. |
| **CO4** | Spot gaps in the system and devise improvements. |
| **CO5** | Identify and report vulnerabilities in the system. |

**Course Name: Software Project Management (MC4001)**

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| **CO1** | Understand the activities during the project scheduling of any software application. |
| **CO2** | Learn the risk management activities and the resource allocation for the projects. |
| **CO3** | Apply the software estimation and recent quality standards for evaluation of the software projects |
| **CO4** | Acquire knowledge and skills needed for the construction of highly reliable software project |

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| **CO5** | Create reliable, replicable cost estimation that links to the requirements of project planning and managing. |

**Course Name: Advanced Database Technology Laboratory (MC4211)**

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| **CO1** | Design and implement advanced databases. |
| **CO2** | Use big data frameworks and tools. |
| **CO3** | Formulate complex queries using SQL. |
| **CO4** | Create an XML document and perform Xquery. |
| **CO5** | Query processing in Mobile databases using open source tools. |

**Course Name: Full Stack Web Development Laboratory (MC4212)**

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|---|---|
| **CO1** | To implement and deploy the client side of the web application. |
| **CO2** | To develop and deploy server side applications using NodeJS. |
| **CO3** | To use Express framework in web development. |
| **CO4** | To implement and architect database systems in both NoSQL and SQL environments. |
| **CO5** | To develop a full stack single page application using React, NodeJS, and a Database and deploy using containers. |

**Course Name: Communication Skills Enhancement - II (MC4213)**

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| **CO1** | Students will be able to make presentations and participate in Group discussions with confidence. |
| **CO2** | Students will be able to perform well in the interviews. |
| **CO3** | Students will make effective presentations. |

**Course Name: Introduction To Computer Organization And Operating Systems (BX4003)**

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|---|---|
| **CO1** | Understand the basics structure of computers, operations and instructions. |
| **CO2** | Design arithmetic and logic unit, control unit. |
| **CO3** | Understand the various memory systems and I/O communication. |
| **CO4** | Understand operating system functions, types, system calls. |
| **CO5** | Analyze Process and various scheduling algorithms. |

**Course Name: Database Management Systems (BX4004)**

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|---|---|
| **CO1** | Understand the basic concepts of the database and data models. |
| **CO2** | Design a database using ER diagrams and map ER into Relations and normalize the relations |
| **CO3** | Acquire the knowledge of query evaluation to monitor the performance of the DBMS. |
| **CO4** | Develop a simple database applications using normalization. |

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| **CO5** | Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems. |

**SEMESTER III**

**Course Name: Machine Learning (MC4301)**

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| **CO1** | Understand about Data Preprocessing, Dimensionality reduction |
| **CO2** | Apply proper model for the given problem and use feature engineering techniques |
| **CO3** | Make use of Probability Technique to solve the given problem. |
| **CO4** | Analyze the working model and features of Decision tree. |
| **CO5** | Choose and apply appropriate algorithm to learn and classify the data. |

**Course Name: Internet Of Things (MC4302)**

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|---|---|
| **CO1** | Define the infrastructure for supporting IoT deployments. |
| **CO2** | Understand the usage of IoT protocols for communication between various IoT devices. |
| **CO3** | Design portable IoT using Arduino/Raspberry Pi /equivalent boards. |
| **CO4** | Understand the basic concepts of security and governance as applied to IoT. |
| **CO5** | Analyze and illustrate applications of IoT in real time scenarios. |

**Course Name: Cryptocurrency And Blockchain Technologies (MC4013)**

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|---|---|
| **CO1** | Identify Block Chain as Data structure and Distribution Data. |
| **CO2** | Implement the transactions of Crypto currency. |
| **CO3** | Identify the different ways to achieve Block chain Technology**.** |
| **CO4** | Design and build smart contracts. |
| **CO5** | Use smart contract for real world application in a Blockchain Platform. |

**Course Name: Organizational Behavior (MC4022)**

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| **CO1** | Students will have a better understanding of human behavior in organization. |
| **CO2** | They will know the framework for managing individual and group performance. |
| **CO3** | Characteristics of attitudes and components of attitudes — A brief discussion. |
| **CO4** | List the determinants of personality. |
| **CO5** | List the characteristics of various leadership styles. |

**Course Name: Big Data Analytics (MC4025)**

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| **CO1** | Able to apply Hadoop for analyzing Big Volume of Data. |
| **CO2** | Able to access ,store , do operations on data as Files and directories. |
| **CO3** | Able to implement MapReduce Concept in analyzing BigData. |
| **CO4** | Able to implement event streaming using Kafka API. |

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| **CO5** | Able to access volume of data with Hadoop Framework |

**Course Name: Environmental Sustainability (CX4016)**

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| **CO1** | Demonstrate an understanding of key concepts in environmental economics, including valuation methods and externalities. |
| **CO2** | Analyze the interconnections between economic development, natural resource management, and sustainability. |
| **CO3** | Evaluate the significance of biodiversity and its impact on ecosystem services and human well-being. |
| **CO4** | Assess the causes and effects of pollution and propose strategies for effective waste management and environmental protection. |
| **CO5** | Critically examine environmental policies and their effectiveness in addressing contemporary environmental issues, such as climate change and resource depletion. |

**Course Name: Machine Learning Laboratory (MC4311)**

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|---|---|
| **CO1** | Apply data preprocessing technique and explore the structure of data to prepare for predictive modeling. |
| **CO2** | Understand how to select and train a model and measure the performance. |
| **CO3** | Apply feature selection techniques in machine learning. |
| **CO4** | Construct bayesian network for appropriate problem. |
| **CO5** | Learn about parametric and non-parametric machine learning algorithms and implement to practical situations. |

**Course Name: Internet Of Things Laboratory (MC4311)**

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|---|---|
| **CO1** | Apply data preprocessing technique and explore the structure of data to prepare for predictive modeling. |
| **CO2** | Understand how to select and train a model and measure the performance. |
| **CO3** | Apply feature selection techniques in machine learning. |
| **CO4** | Construct bayesian network for appropriate problem. |
| **CO5** | Learn about parametric and non-parametric machine learning algorithms and implement to practical situations. |

**Course Name: Mathematical Foundations Of Computer Science (BX4005)**

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| **CO1** | Apply Mathematical Logic to validate logical arguments and programmes. |
| **CO2** | Apply combinatorial counting principles to solve application problems. |
| **CO3** | Apply graph model and graph techniques for solving network other connectivity related problems. |
| **CO4** | Apply algebraic ideas in developing cryptograph techniques for solving network security problems. |
| **CO5** | Apply Boolean laws in developing and simplifying logical circuits. |

**Course Name: Basics Of Computer Networks (BX4006)**

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|---|---|
| **CO1** | Able to trace the flow of information from one node to another node in the network. |
| **CO2** | Able to Identify the components required to build different types of networks. |
| **CO3** | Able to understand the functionalities needed for data communication into layers. |
| **CO4** | Able to choose the required functionality at each layer for given application. |
| **CO5** | Able to understand the working principles of various application protocols and fundamentals of security issues and services available. |