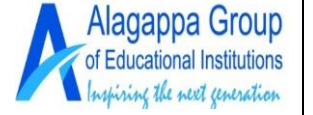




# Dr. Umayal Ramanathan College for Women

Recognized u/s 2(f) & 12(B) of the UGC Act 1956  
Affiliated to Alagappa University  
(Estd. by Dr. Alagappa Chettiar Educational Trust)  
Karaikudi - 3



## DEPARTMENT OF INFORMATION TECHNOLOGY

Programme: B. Sc., IT

Course outcomes of all courses under regulations 2023

Semester I	
<b>Course Name &amp; Code: தமிழ் இலக்கிய வரலாறு - I - 2311T</b>	
CO1	சங்க இலக்கியத்தில் காணப்பெறும் வாழ்வியல் சிந்தனைகளை அறிந்து கொள்வர்
CO2	அற இலக்கியம் மற்றும் தமிழ் காப்பியங்களின் வழி வாழ்வியல் சிந்தனையைப் பெறுவர்
CO3	பக்தி இலக்கியங்களைக் கற்பதன் மூலம் பக்தி நெறியினையும், பகுத்தறிவு இலக்கியங்களைக் கற்பதன் வழி நல்லிணக்கத்தையும் தெரிந்து பின்பற்றுவர்
CO4	மொழியறிவோடு சிந்தனைத் திறனைப் பெறுவர்
CO5	மொழிப் பயிற்சிக்குத் தேவையான இலக்கணங்களைக் கற்பர்
<b>Course Name &amp; Code: General English – I - 2312E</b>	
CO1	Outline the fundamental concepts of C programming languages, and its features
CO2	Demonstrate the programming methodology
CO3	Identify suitable programming constructs for problem solving
CO4	Select the appropriate data representation, control structure functions and concepts based on the problem requirement.
CO5	Evaluate programme performance by fixing the error
<b>Course Name &amp; Code: PROGRAMMING IN C- 23BIT1C1</b>	
CO1	Remember the concept of rectification of errors and Bank reconciliation statements
CO2	Apply the knowledge in preparing detailed accounts of sole trading concerns
CO3	Analyse the various methods of providing depreciation
CO4	Evaluate the methods of calculation of profit
CO5	Determine the royalty accounting treatment and claims from insurance companies in case of loss of stock.
<b>Course Name &amp; Code: Programming in C Lab- 23BIT1P1</b>	
CO1	Demonstrate the understanding of syntax and semantics of C programs.
CO2	Identify the problem and solve using C programming techniques.
CO3	Identify suitable programming constructs for problem solving.
CO4	Analyze various concepts of C language to solve the problem in an efficient way.
CO5	Develop a C program for a given problem and test for its correctness.
<b>Course Name &amp; Code: OFFICE AUTOMATION- 23BIT1S1</b>	
CO1	Possess the knowledge on the basics of computers and its components
CO2	Gain knowledge on Creating Documents, spreadsheet and presentation.
CO3	Learn the concepts of Database and implement the Query in Database
CO4	Demonstrate the understanding of different automation tools.
CO5	Utilize the automation tools for documentation, calculation and presentation purpose.
<b>Course Name &amp; Code: Fundamentals of Computers- 23BIT1FC</b>	
CO1	Outline the computer fundamentals and various problem solving concepts in computers
<b>Course Name &amp; Code: Fundamentals of Computers- 23BIT1FC</b>	
CO2	Describe the basic computer organization, software, computer languages, software development life cycle and the need of structured programming in solving a computer problem

<b>CO3</b>	Identify the types of computer languages, software, computer problems and examine how to setup expressions and equations to solve the problem.
<b>CO4</b>	Choose most appropriate programming languages, constructs and features to solve the problems in diversified domains.
<b>CO5</b>	Analyze the design of modules and functions in structuring the solution and various organizing tools in problem solving.

### Semester II

#### Course Name & Code: தமிழ்இலக்கியவரலாறு - II - 2321T

<b>CO1</b>	சுற்றிலக்கியங்களின் வழி இலக்கியச் சுவையினையும் பண்பாட்டின் அறிவினையும் பெறுவர்.
<b>CO2</b>	புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்.
<b>CO3</b>	திராவிடஇயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழிஉணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனையைப் பெறுவர்.
<b>CO4</b>	தமிழ் மொழியைப் பிழையின்றி எழுதவும் புதிய கலைச் சொற்களை உருவாக்கும் அறிந்து கொள்வர்.
<b>CO5</b>	போட்டித்தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ் பாடத்தினைப் பயன் கொள்ளும் வகையில் பயிற்சி பெறுவர்.

#### Course Name & Code: General English – II - 2312E

<b>CO1</b>	Realize the importance of resilience
<b>CO2</b>	Become good decision-makers
<b>CO3</b>	Imbibe problem-solving skills
<b>CO4</b>	Use tenses appropriately
<b>CO5</b>	Use English effectively at the work place.

#### Course Name & Code: AVAPROGRAMMING - 23BIT2C1

<b>CO1</b>	Understand the basic Object-oriented concepts.
<b>CO2</b>	Implement the basic constructs of Core Java.
<b>CO3</b>	Implement Method, classes and inheritance of Core Java.
<b>CO4</b>	Implement Packages, Managing Errors and Exceptions, multi-threading of Core Java.
<b>CO5</b>	Understand and use the components of AWT and Event handling.

#### Course Name & Code: JAVA PROGRAMMING LAB - 23BIT2P1

<b>CO1</b>	Use appropriate software development environment to write, compile and execute object-oriented Java programs
<b>CO2</b>	Analyze and identify necessary mechanisms of Java needed to solve real-world problem
<b>CO3</b>	Implement Inheritance, package.
<b>CO4</b>	Implement multi-threading and exception-handling.
<b>CO5</b>	Execute GUI , AWT and apply event handling.

#### Course Name & Code: BASICS OF INTERNET- 23BIT2S1

<b>CO1</b>	Knows the basic concept in HTML Concept of resources in HTML
<b>CO2</b>	Knows Design concept. Concept of Meta Data Understand the concept of save the files.
<b>CO3</b>	Understand the page formatting. Concept of list
<b>CO4</b>	Creating Links.-Know the concept of creating link to email address
<b>CO5</b>	Concept of adding images-Understand the table creation.

#### Course Name & Code: PROBLEM SOLVING TECHNIQUES - 23BIT2S2

<b>CO1</b>	Understand the logic of problem and analyses implementation of algorithm and Top Down approach and concept of Recursion
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<b>CO2</b>	Able to understand the Sequence of Numbers and Series Fibonacci, Reversing ,Base Conversion.
<b>CO3</b>	Able to do Algebraic operations
<b>CO4</b>	Coverage of Arrays and its Logics
<b>CO5</b>	Text Processing and Pattern Searching Approach
<b>Course Name &amp; Code: தமிழகவரலாறும்பண்பாடும்-2331T</b>	
<b>CO1</b>	தமிழக வரலாற்றை அறிந்துகொள்வர்.
<b>CO2</b>	தமிழரின் தொன்மையை அறிவர்.
<b>CO3</b>	தமிழரின் பண்பாட்டினை அறிந்துகொள்வர்.
<b>CO4</b>	பிற பண்பாட்டுத்தாக்கம் ஏற்படும் முறையினை அறிவர்.
<b>CO5</b>	தமிழரின் வரலாற்றுத் தொன்மையையும் பண்பாட்டு பழமையையும் அறிந்து கொள்வர்.
<b>Course Name &amp; Code: General English -III-2332E</b>	
<b>CO1</b>	Listen actively
<b>CO2</b>	Develop interpersonal relationship skills
<b>CO3</b>	Acquire self - confidence to cope with stress
<b>CO4</b>	Master grammar skills
<b>CO5</b>	Carryout business communication effectively
<b>Course Name &amp; Code: PHP PROGRAMMING - 23BIT3C1</b>	
<b>CO1</b>	To implement PHP script using Decisions and Loops
<b>CO2</b>	To develop PHP applications using Arrays & Strings
<b>CO3</b>	Manipulate files and directories.
<b>CO4</b>	To implement PHP script using Exception Handling and oops
<b>CO5</b>	To develop PHP applications using Session and Cookie
<b>Course Name &amp; Code PHP PROGRAMMING LAB - 23BIT3P1</b>	
<b>CO1</b>	Demonstrate simple programs using PHP script-To implement using Decisions and Loops
<b>CO2</b>	To develop PHP applications using Arrays& Strings
<b>CO3</b>	To implement PHP script using Exception Handling and oops
<b>CO4</b>	To implement PHP script using Exception Handling and oops
<b>CO5</b>	To develop PHP web applications using Session and Cookie
<b>Course Name &amp; Code: Cyber Forensics - 23BIT3S1</b>	
<b>CO1</b>	Understand the definition of computer forensics fundamentals.
<b>CO2</b>	Evaluate the different types of computer forensics technology.
<b>CO3</b>	Analyze various computer forensics systems.
<b>CO4</b>	Apply the methods for data recovery, evidence collection and data seizure.
<b>CO5</b>	Gain your knowledge of duplication and preservation of digital evidence.
<b>Course Name &amp; Code: Enterprise Resource Planning - 23BIT3S2</b>	
<b>CO1</b>	Understand the basic concepts, Evolution and Benefits of ERP.
<b>CO2</b>	Identify different technologies used in ERP
<b>CO3</b>	Understand and apply the concepts of ERP manufacturing perspective and ERP modules
<b>CO4</b>	Discuss the benefits of ERP
<b>CO5</b>	Apply different tools used in ERP
<b>Course Name &amp; Code: Adipadai Tamil -233AT</b>	
<b>CO1</b>	தமிழ்உயிமெழுத்துவடிவங்கடைஅறிந்துமகொள்வர்
<b>CO2</b>	மமய்யமுத்துக்கள்வடிவங்கடைஅறிந்துமகொள்வர்
<b>CO3</b>	எழுதும்பயிற்சிமபறுவர்
<b>CO4</b>	மசொற்கடைஅறிவர்
<b>CO5</b>	எழுத்துக்கள்ஒலிக்கும்முடறஅறிவர்

**Semester IV****Course Name & Code: Tamilum Ariviyalum -2341T**

C01	தாய்மொழி வழியாக அறிவியல் பற்றி சிந்தித்து செயலாற்றும் திறன் பெற்றிருப்பர்.
C02	தாய்மொழி வழியாக அறிவியல் பற்றி சிந்திக்கவும் செய்திருப்பர்.
C03	அறிவியல் கலைச் சொல்லாக்கம் பற்றி அறிய செய்வர்.
C04	அறிவியல் தொழில் நுட்பத்தின் வளர்ச்சி பற்றி அறிந்திருப்பர்.
C05	அறிவியல் வளர்ச்சியில் தகவல் தொழில்நுட்பத்தின் பங்கு பற்றி அறிந்து கொள்ளுதல்.

**Course Name & Code: PYTHON PROGRAMMING - 23BIT4C1**

C01	Outline the basic concepts in python language. Interpret different looping and conditional Statements in python language.
C02	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.
C03	Concept of function, Implementing the concept strings in various application, Significance of Modules, Concept of reading and writing files.
C04	To implement Exception Handling and oops.
C05	To develop GUI applications using T kinter, Turtle.

**Course Name & Code: PYTHON PROGRAMMING LAB - 23BIT4P1**

C01	Understand the significance of control statements, loops and functions in creating Simple programs.
C02	Interpret the core data structures available in python to store, process and sort the data.
C03	Develop the real time applications using python programming language.
C04	Analyze the real time problem using suitable python concepts.
C05	Assess the GUI application using appropriate concepts in python.

**Course Name & Code: Robotics and Its Applications -23BIT4S1**

C01	Describe the different physical forms of robot architectures.
C02	Kinematically model simple manipulator and mobile robots.
C03	Mathematically describe a kinematic robot system
C04	Analyse manipulation and navigation problems using knowledge of coordinate frames, kinematics, optimization, control, and uncertainty.
C05	Program robotics algorithms related to kinematics, control, optimization, and uncertainty.

**Course Name & Code: Organizational Behaviour-23BIT4S2**

C01	To define organizational behaviour, understand the opportunity through OB
C02	To apply self-awareness, motivation, leadership and learning theories at workplace.
C03	To analyse the complexities and solutions of group behaviour.
C04	To impact and bringing positive change in the culture of the organization.
C05	To create a congenial climate in the organization.

**Course Name & Code: Adipadai Tamil- 234AT**

C01	அறம் உணர்தல்
C02	அறச்சிந்தடைகடைப் ிந்துமகொள்ளுதல்
C03	குறள்கூறும் அறத்ததம் பொருத்திப் பொர்த்தல்
C04	தமிழறிஞர்கடை அறிதல்
C05	சுயமொக எழுதத்தமதொங்குதல்

**Semester V****Course Name & Code: DATA COMMUNICATIONS AND NETWORKING - 23BIT5C1**

C01	Understand the fundamental concepts of computer network and its application areas.
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<b>C02</b>	Identify and use various networking techniques and components to establish networking connection and transmission
<b>C03</b>	Analyse the services performed by the different network layers and recent advancements in networking
<b>C04</b>	Compare various networking models, layers, protocols and technologies.
<b>C05</b>	Select the appropriate networking mechanisms to build a reliable network.
<b>Course Name &amp; Code: .NET Programming - 23BIT5C2</b>	
<b>C01</b>	Understand the concept of .Net Framework
<b>C02</b>	Evaluate arrays, strings, exceptions and OOPs concept
<b>C03</b>	Build and debug the windows forms with VB.NET controls
<b>C04</b>	Identify the various stages in developing web forms
<b>C05</b>	Use a DO.Net frame work in a windows/web application to read, insert, and update date data in a database.
<b>Course Name &amp; Code: NET Programming Lab- 23BIT5P1</b>	
<b>C01</b>	Demonstrate MS Visual studio. Net IDE to create applications.
<b>C02</b>	Apply VB. NET and ASP .NET concepts to design applications.
<b>C03</b>	Build a web application concept to solve the problem
<b>C04</b>	Evaluate the applications to fix the errors
<b>C05</b>	Use ADO.Net frame work in a Windows/Web application to read, insert, and update data in a database.
<b>Course Name &amp; Code: E-Commerce and Digital Marketing- 23BIT5C3</b>	
<b>C01</b>	Understanding the fundamental concepts and principles regarding the concepts of e-commerce, including its evolution, types, and business models.
<b>C02</b>	Gain knowledge of managing e-commerce platforms, payment gateways, and security measures.
<b>C03</b>	Helps to identify the core concepts of marketing and the role of marketing in society.
<b>C04</b>	Explore the role of marketing in sales for e-commerce business.
<b>C05</b>	Gain insights into the ethical and legal considerations in e-commerce and digital marketing practices, including privacy, data protection, and regulatory compliance.
<b>Course Name &amp; Code: Relational Database Management System- 23BIT5E1</b>	
<b>C01</b>	Out line the fundamental RDBMS concept and PL/SQL
<b>C02</b>	Apply database operations, mapping, normolisation, SQL and PL/SQL
<b>C03</b>	Analyse the requirements, to implement relational database concepts
<b>C04</b>	Evaluate the database based on various models and normalization.
<b>C05</b>	Design and construct normalized tables and manipulate effectively using SQL and PL/SQL database objects.
<b>Course Name &amp; Code: Data Mining- 23BIT5E2</b>	
<b>C01</b>	Outline the fundamentals and the principles of Data Mining
<b>C02</b>	Apply suitable different preprocessing for data mining
<b>C03</b>	Classify data-mining techniques based on the different applications
<b>C04</b>	Analyze the various datamining algorithms with respect to functionality
<b>C05</b>	Recommend appropriatedatamodelsfordataminingtechniques to solverealworld problems
<b>Course Name &amp; Code: Artificial Intelligence- 23BIT5E3</b>	
<b>C01</b>	Understand the various concepts of AI Techniques.
<b>C02</b>	Understand various problem-solving method in AI.
<b>C03</b>	Understand the logic prediction in AI.
<b>C04</b>	Understand Planning Construction in AI.
<b>C05</b>	Understand various type of Decision-Making techniques.
<b>Course Name &amp; Code: - Machine Learning – 23BIT5E4</b>	
<b>C01</b>	Outline the importance of machine learning in terms of designing intelligent machines
<b>C02</b>	Identify suitable machine learning techniques for their Altima applications
<b>C03</b>	Analyze the theoretical concepts and how they relate to the practical aspects of machine learning
<b>C04</b>	Assess the significance of principles, algorithms and applications of machine learning through a hands -on approach



<b>CO5</b>	Compare the machine learning techniques with respective functionality
<b>Course Name &amp; Code: Internship / Industrial Visit/ Field Visit- 23BIT5IV</b>	
<b>CO1</b>	Practical training at the Industry/ Banking Sector / Private/ Public sector organizations / Educational institutions, enable the students gain professional experience and also become responsible citizens.

<b>Semester VI</b>	
<b>Course Name &amp; Code: Software Project Management- 23BIT6C1</b>	
<b>CO1</b>	Understand the principles and concepts of project management
<b>CO2</b>	Knowledge gained to train software project managers
<b>CO3</b>	Apply software project management methodologies
<b>CO4</b>	Able to create comprehensive project plans
<b>CO5</b>	Evaluate and mitigate risks associated with software development process
<b>Course Name &amp; Code: Dissertation- 23BIT6D</b>	
<b>CO1</b>	Students will demonstrate creativity and innovation in the design and implementation of IT solutions, and in the exploration of new ideas and approaches with in the field.
<b>CO2</b>	Students will gain knowledge about technological components of the software's
<b>CO3</b>	Identifying, analyzing, and designing systems to solve information technology problems
<b>Course Name &amp; Code: Internet of Things and Its Applications- 23BIT6E1</b>	
<b>CO1</b>	Understand the basics of IoT
<b>CO2</b>	Interpret the impact and challenges by IoT.
<b>CO3</b>	Compare different Application protocols for IoT.
<b>CO4</b>	Analyze applications of IoT in real time scenario.
<b>CO5</b>	Understand the Privacy and Security Issues.
<b>Course Name &amp; Code: Cloud Computing - 23BIT6E2</b>	
<b>CO1</b>	Explain the core concepts of the cloud computing paradigm.
<b>CO2</b>	Out line the virtualization technology and determine their uses.
<b>CO3</b>	Apply the fundamental concepts in data centers to understand the tradeoffs in power, efficiency and cost.
<b>CO4</b>	Identify resource management fundamentals, i.e. resource abstraction, sharing and sand boxing and outline their role in managing infrastructure in cloud computing.
<b>CO5</b>	Analyze various cloud programming models and apply them to solve problems on the cloud.
<b>Course Name &amp; Code: Introduction to Data Science - 23BIT6E3</b>	
<b>CO1</b>	Understand the basics in Data Science.
<b>CO2</b>	Understand overview and building process in Data Science.
<b>CO3</b>	Understand Data Collection and Data Pre-Processing .
<b>CO4</b>	Understand the Data Analytics/ Statistics.
<b>CO5</b>	Analyze various Model Development/Evaluation.
<b>Course Name &amp; Code: Big Data Analytics- 23BIT6E4</b>	
<b>CO1</b>	Understand Big Data and its analytics in the real world.
<b>CO2</b>	Exposure to Data Analytics with R.
<b>CO3</b>	Understand the usage of Machine Learning in Big Data Analytics.
<b>CO4</b>	Understand Common predictive Modeling Techniques.
<b>CO5</b>	Analyze the Big Data framework like Hadoop.
<b>Course Name &amp; Code: Quantitative Aptitude- 23BIT6S1</b>	
<b>CO1</b>	Understand the concepts, application and the problems of numbers
<b>CO2</b>	To have basic knowledge and understanding about percentage, profit & loss related processing
<b>CO3</b>	To understand the concepts of time and work
<b>CO4</b>	Speaks about the concepts of probability, discount
<b>CO5</b>	Understanding the concept of problem solving involved in stocks & shares, graphs

Programme: M. Sc., IT

Course outcomes of all courses under regulations 2023

Semester I	
<b>Course Name &amp; Code: PYTHON PROGRAMMING- 23MIT1C1</b>	
<b>CO1</b>	Explain the basic concepts in python language.
<b>CO2</b>	Apply the various data types and identify the usage of control statements, loops, functions and modules in python for processing the data
<b>CO3</b>	Analyze and solve problems using basic constructs and techniques of python.
<b>CO4</b>	Assess the approaches used in the development of interactive application.
<b>CO5</b>	To build real time programs using python
<b>Course Name &amp; Code: PYTHON PROGRAMMING PRACTICAL - 23MIT1P1</b>	
<b>CO1</b>	Understand the significance of control statements, loops and functions in creating simple programs.
<b>CO2</b>	Apply the core data structures available in python to store, process and sort the data
<b>CO3</b>	Analyze the real time problem using suitable python concepts
<b>CO4</b>	Assess the complex problems using appropriate concepts in python
<b>CO5</b>	Develop the real time applications using python programming language.
<b>Course Name &amp; Code: WEB DEVELOPMENT USING WORD PRESS - PRACTICAL - 23MIT1P2</b>	
<b>CO1</b>	Identify the tools which will be suitable for the requirement of the webpage.
<b>CO2</b>	Implement Java script and Style Sheets effectively in the Web Pages
<b>CO3</b>	Analyze the different tools and built-in functions available to be applied in the webpage
<b>CO4</b>	Rate the design and effectiveness of the Web Pages created.
<b>CO5</b>	Design and publish a website using Word press
<b>Course Name &amp; Code: DATA STRUCTURES - 23MIT1E1</b>	
<b>CO1</b>	Outline the basic data structures
<b>CO2</b>	Identify the different operations and memory representations
<b>CO3</b>	Interpret different techniques with their complexities
<b>CO4</b>	Compare the applications of various data structures
<b>CO5</b>	Choose an algorithm to solve simple problems suited for appropriate situations
<b>Course Name &amp; Code: COMPILER DESIGN - 23MIT1E2</b>	
<b>CO1</b>	Identify the major phases of compilation and the functionality of LEX and YACC
<b>CO2</b>	Describe the functionality of compilation process and symbol table management
<b>CO3</b>	Apply the various parsing, optimization techniques and error recovery routines to have a better code for code generation.
<b>CO4</b>	Analyze the techniques and tools needed to design and implement compilers.
<b>CO5</b>	Test a compiler and experiment the knowledge of different phases in compilation
<b>Course Name &amp; Code: NATURAL LANGUAGE PROCESSING- 23MIT1E3</b>	
<b>CO1</b>	Describe the concepts of morphology, syntax, semantics, discourse & pragmatics of natural language
<b>CO2</b>	Identify various linguistic and statistical features relevant to the basic NLP task, namely, spelling correction, morphological analysis, parsing and semantic analysis
<b>CO3</b>	Classify the text into an organized group using a set of handicraft linguistic rules with appropriate NLP processes and algorithms
<b>CO4</b>	Analyze the system with various language analysis methods and interpret the results
<b>CO5</b>	Assess NLP systems, identify and suggest solutions for the shortcomings
<b>Course Name &amp; Code: OPERATING SYSTEMS - 23MIT1E4</b>	

<b>CO1</b>	Outline the fundamental concepts of an OS and their respective functionality
<b>CO2</b>	Demonstrate the importance of open-source operating system commands
<b>CO3</b>	Identify and stimulate management activities of operating system
<b>CO4</b>	Analyze the various services provided by the operating system
<b>CO5</b>	Interpret different problems related to process, scheduling, deadlock, memory and files
<b>Course Name &amp; Code: DIGITAL COMPUTER ARCHITECTURE - 23MIT1E5</b>	
<b>CO1</b>	Demonstrate the fundamental concept of binary representation and codes, combinational circuits, Instruction formats, register operations and memory organization
<b>CO2</b>	Explain the various types of flip flops, different types of micro operations, as well as the addressing modes in the instruction set
<b>CO3</b>	Apply the various number conversion systems and simplification of equations using K-map
<b>CO4</b>	Analyze the various design of combinational circuits and flip flops to design a computer
<b>CO5</b>	Distinguish the major components of a computer including CPU, memory, I/O and storage
<b>Course Name &amp; Code: HUMAN COMPUTER INTERACTION - 23MIT1E6</b>	
<b>CO1</b>	Describe typical human-computer interaction (HCI) models, styles, and various historic HCI paradigms
<b>CO2</b>	Identify the usability and the beneficiary factors of User support systems
<b>CO3</b>	Analyze the core theories, models and methodologies in the field of HCI
<b>CO4</b>	Evaluate interactive systems based on the human factor theories
<b>CO5</b>	Elaborate an interactive system based on the design principles, standards and guidelines

<b>SEMESTER II</b>	
<b>Course Name &amp; Code: DATABASE SYSTEMS- 23MIT2C1</b>	
<b>CO1</b>	Explain the relational databases and uses of PL/SQL
<b>CO2</b>	Apply Schema, ER- Model, normalization, transaction, concurrency, and recovery on tables using SQL and PL/SQL.
<b>CO3</b>	Analyze and manage relational & distributed, database, transaction, concurrency control and query languages
<b>CO4</b>	Assess databases based on models and Normal Forms.
<b>CO5</b>	Design and construct tables and manipulate it effectively using PL/SQL database objects
<b>Course Name &amp; Code: RDBMS LAB - 23MIT2P1</b>	
<b>CO1</b>	Choose appropriate SQL queries and PL/SQL blocks for the database.
<b>CO2</b>	Implement SQL and PL/SQL blocks for the given problem effectively.
<b>CO3</b>	Analyse the problem and Exceptions using queries and PL/SQL blocks.
<b>CO4</b>	Validate the database for normalization using SQL and PL/SQL blocks.
<b>CO5</b>	Design Database tables, create Procedures, user-defined functions and Triggers.
<b>Course Name &amp; Code: OPEN-SOURCE TECHNOLOGIES - PRACTICAL- 23MIT2P2</b>	
<b>CO1</b>	Demonstrate the setup and configuration of development environment to write PHP and Ruby Scripts
<b>CO2</b>	Select the appropriate language fundamentals and techniques to write and compile PHP and Ruby programs
<b>CO3</b>	Examine the bugs and analyze how to prevent and remove the bugs
<b>CO4</b>	Test and debug the application with sample inputs to check the correctness and consistency of the scripts
<b>CO5</b>	Create simple programs that make use of various PHP and Ruby features and functions and solve web application and database tasks using PHP
<b>Course Name &amp; Code: NETWORKS AND SECURITY- 23MIT2E1</b>	



<b>CO1</b>	Outline the concepts and fundamentals of data communication and computer networks
<b>CO2</b>	Identify the usage and importance of layered model, network security and web security
<b>CO3</b>	Classify the techniques based on required application
<b>CO4</b>	Analyze the significant applications of protocols and layers used in data communication and networking
<b>CO5</b>	Explain the functionality of various techniques and algorithms that works at different layers
<b>Course Name &amp; Code: BIOMETRIC TECHNIQUES - 23MIT2E2</b>	
<b>CO1</b>	Outline the existing theories, methods and interpretations in the field of biometrics
<b>CO2</b>	Identify the deployment areas, competing technologies, strength and weakness of various Physiological and Behavioral Biometrics
<b>CO3</b>	Analyze various Application areas, Biometric security issues and Biometric standards
<b>CO4</b>	Assess the methods relevant for design, development and operation of biometric access control systems
<b>CO5</b>	Determine identification /verification systems to validate the user identity and technological uplifts in biometrics compared to traditional securing mechanisms
<b>Course Name &amp; Code: BLOCK CHAIN TECHNOLOGY- 23MIT2E3</b>	
<b>CO1</b>	Understand and explore the working of Blockchain technology
<b>CO2</b>	Identify the security and privacy implications of blockchain technology
<b>CO3</b>	Apply the learning of solidity to build de-centralized apps on Ethereum
<b>CO4</b>	Analyze the working of Smart Contracts and the working of Hyperledger
<b>CO5</b>	Assess the methods relevant for design, development and operation of blockchain based applications
<b>Course Name &amp; Code: SOFTWARE ENGINEERING- 23MIT2E4</b>	
<b>CO1</b>	Recognize the software process models including the specification, design, implementation, and testing for a software project
<b>CO2</b>	Use recent and advanced tools necessary for software project development, testing, management and reuse
<b>CO3</b>	Compare and contrast various design, testing and quality issues
<b>CO4</b>	Prioritize the requirements and risk accordingly that meet user expected performance, maintenance and quality
<b>CO5</b>	Design software projects with well-defined architecture, modules, components and interfaces
<b>Course Name &amp; Code: OBJECT ORIENTED ANALYSIS AND DESIGN- 23MIT2E5</b>	
<b>CO1</b>	Recognize the concepts and principles of object-oriented analysis, design and Testing
<b>CO2</b>	Demonstrate the importance of system development process using various approaches and choose the relevant technique for a system in each phases of SDLC
<b>CO3</b>	Differentiate various object-oriented analysis, design and testing methods and models.
<b>CO4</b>	Assess various analysis, design and testing strategies appropriate to build high-performance object-oriented system
<b>CO5</b>	Design Object oriented systems using object modeling techniques and analyze them for correctness and quality
<b>Course Name &amp; Code: SOFTWARE PROJECT MANAGEMENT - 23MIT2E6</b>	
<b>CO1</b>	Understanding of project management fundamentals such as project planning, risk management and quality assurance
<b>CO2</b>	Choose the appropriate scheduling and testing techniques to build a quality product
<b>CO3</b>	Apply different cost estimation techniques and quality measures for software development
<b>CO4</b>	Differentiate various software development models and methodologies, planning activities and scheduling methods
<b>CO5</b>	Asses the importance of software project documentation and identify the methods to create project documentation, including requirements documents, design documents, and project plans

**Semester III****Course Name & Code: ADVANCED JAVA- 23MIT3C1**

<b>CO1</b>	Understand and explain programming language constructs, Java mechanisms, OOP and Internet programming concepts
<b>CO2</b>	Apply logical constructs as well as include Object oriented features, Packages, Interfaces, Exceptions and Threads , JDBC, Internet programming technologies
<b>CO3</b>	Compare and contrast classical and advanced Java in terms of features, architecture, platform and technologies
<b>CO4</b>	Choose an approach to solve real world problem from the acquired knowledge of Java
<b>CO5</b>	Create programs that make strong use of classes and objects and develop JDBC,GUI, Web and Enterprise based applications

**Course Name & Code: ADVANCED JAVA - PRACTICAL - 23MIT3P1**

<b>CO1</b>	Demonstrate understanding and use of different Java mechanisms for efficient application development
<b>CO2</b>	Use an appropriate development environment to write, compile and run Java Programs
<b>CO3</b>	Analyze the problem and apply the appropriate problem-solving method with the required building blocks and mechanisms of Core and Advanced Java
<b>CO4</b>	Test the correctness and consistency of the Java program with different inputs
<b>CO5</b>	Create simple applications that make use of core java concepts and develop JDBC, GUI, Web and Enterprise based applications

**Course Name & Code: MOBILE DEVELOPMENT LAB- 23MIT3P2**

<b>CO1</b>	Demonstrate the setup and configuration of Android Development Environment.
<b>CO2</b>	Apply the necessary UI components with different styles, themes, views, and layouts
<b>CO3</b>	Examine and implement the required services such as messaging, mailing, multimedia concepts for the given problem
<b>CO4</b>	Test and debug the Android applications with different inputs.
<b>CO5</b>	Create mobile applications that make use of various android features, functions and database tasks

**Course Name & Code: R Programming - 23MIT3C2**

<b>CO1</b>	Explain critical R programming concepts
<b>CO2</b>	Demonstrate how to install and configure R Studio
<b>CO3</b>	Apply OOP concepts in R programming
<b>CO4</b>	Explain the use of data structure and loop functions
<b>CO5</b>	Analyse data and generate reports based on the data
<b>CO6</b>	Apply various concepts to write programs in R

**Course Name & Code: RESEARCH METHODOLOGY- 23MIT3E1**

<b>CO1</b>	Understanding of research, IPR and patent fundamentals
<b>CO2</b>	Identify the issues involved in research, IPR and patent filing
<b>CO3</b>	Apply suitable instrumentation and sampling techniques for the research studies and recognize the framework for protecting IPR and process for obtaining patents
<b>CO4</b>	Analyze data, and interpret research findings using appropriate methods and importance of IPR and patent protection in promoting research and development
<b>CO5</b>	Design and develop research reports, research proposals, academic papers and patents

**Course Name & Code: INTERNET OF THINGS - 23MIT3E2**

<b>CO1</b>	Outline the fundamental concepts and Terminologies of IoT
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<b>CO2</b>	Determine the IoT enabling technologies, M2M and IoT, fundamentals and technological challenges faced by IoT in terms of Safety, privacy and trust
<b>CO3</b>	Identify the different levels, models and standards of IoT and application areas in domain specific IoT
<b>CO4</b>	Analyze the physical design, logical design, architecture Overview of M2M and IoT and reference models of IoT Architecture
<b>CO5</b>	Assess the application areas and illustrate the implementation of IoT
<b>Course Name &amp; Code: TRENDS IN COMPUTING - 23MIT3E3</b>	
<b>CO1</b>	Outline the history, applications, benefits and limitations of Cloud, Grid and Green computing
<b>CO2</b>	Describe the cloud infrastructure services, virtualization and determine how applications can be developed using cloud services
<b>CO3</b>	Identify cloud storage providers, software components of grid, technologies applied in building a green system and various key sustainability in Green IT Trends
<b>CO4</b>	Analyse the migrations and security concerns of cloud, different grid models, resources and also identify how the distributed computing environments can be built from lower-level services
<b>CO5</b>	Assess the business cases of cloud, and also various laws, approaches and protocols for regulating green IT

<b>Semester IV</b>	
<b>Course Name &amp; Code.NET WITH C# PROGRAMMING - 23MIT4C1</b>	
<b>CO1</b>	Outline the features of C# and ASP.NET concepts to understand the real time applications
<b>CO2</b>	Identify the salient properties of C# programming concepts and ASP .NET Application
<b>CO3</b>	List the various stages involved in creating a web form
<b>CO4</b>	Select the appropriate web controls to develop the web forms
<b>CO5</b>	Construct a database driven web applications with the facilitated web services.
<b>Course Name &amp; Code: .NET WITH C# PROGRAMMING - PRACTICAL- 23MIT4P1</b>	
<b>CO1</b>	Demonstrate simple programs using C# programming concepts such as classes, objects, method overloading
<b>CO2</b>	Solve complex programs using delegates, Lambda expression and LINQ
<b>CO3</b>	Analyze the usage of web server controls, calendar controls, validation controls and menu controls in asp.net application
<b>CO4</b>	Evaluate the role of Cookies, View state and Session state in creating an web Application
<b>CO5</b>	Design a data driven web application by connecting to the data sources
<b>Course Name &amp; Code: PROJECT WITH VIVA VOCE- 23MIT4PR</b>	
<b>CO1</b>	Knowledge of the most advanced research in the candidate's specialization area (Track) of Software Development
<b>CO2</b>	In-depth understanding of academic theory and the preparation of high-quality research pertinent to the field of study
<b>Course Name &amp; Code: INTELLIGENT SYSTEMS- 23MIT4E1</b>	
<b>CO1</b>	Outline the applicability, strength and weakness of artificial intelligence in solving computational problems
<b>CO2</b>	Demonstrate the role of knowledge representation, problem solving and learning in Intelligent-system engineering
<b>CO3</b>	Identify the characteristics of AI, Knowledge representation, Experts systems and its variants with ANN and robotics.
<b>CO4</b>	Analyze a comprehensive background in both software and hardware to work with the future of robotics and adaptive systems
<b>CO5</b>	Assess the scientific background through various real time examples
<b>Course Name &amp; Code: INTRODUCTION TO ROBOTICS- 23MIT4E2</b>	
<b>CO1</b>	Outline the anatomy, specifications and applicability of Robotic system

<b>C02</b>	Demonstrate the role of kinematics and dynamic behavior of robots with programming techniques
<b>C03</b>	Identify the characteristics and functionality of robots in various sectors.
<b>C04</b>	Analyze the various functionality of robotic systems with respect to software and hardware components
<b>C05</b>	Assess the scientific background of robotic systems through various real time examples
<b>Course Name &amp; Code: VIRTUAL AND AUGMENTED REALITY - 23MIT4E3</b>	
<b>C01</b>	Outline the basic terminologies, techniques and applications of VR and AR
<b>C02</b>	Describe different architectures and principles of VR and AR systems
<b>C03</b>	Use suitable hardware and software technologies for different varieties of virtual and augmented reality applications
<b>C04</b>	Analyze and explain the behavior of VR and AR technology relates to human perception and cognition
<b>C05</b>	Assess the importance of VR/AR content and interactions to implement for the real-world problem