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 COMPUTER SCIENCE

Programme: B. Sc., Computer Science

Course outcomes of all courses under regulations 2023

Semester I	
Course Name & Code: *தமிழ் இலக்கிய வரலாறு* - I - 2311T	
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
Course Name & Code: General English – I - 2312E	
CO1	Acquire self-awareness and positive thinking required in various life situations.
CO2	Acquire the attribute of empathy.
CO3	Acquire creative and critical thinking abilities.
CO4	Learn basic grammar.
CO5	Development and integrate the use of four language skills i.e., listening, speaking, reading and writing.
Course Name & Code: Programming in C - 23BCE1C1	
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases
Course Name & Code: Practical I – Programming in C Lab - 23BCEP1	
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases
Course Name & Code: Digital Logic Fundamentals – 23BITA1	
CO1	Identify the logic gates and their functionality.
CO2	Perform number conversions from one system to another system
CO3	Understand the functions of combinational circuits
CO4	Perform number conversions.
CO5	Perform Counter design and learn its operations.
Course Name & Code: Digital Electronics Lab – 23BITAP1	
CO1	Students were able to solve simple gate functions.
CO2	Students were able to solve and Design circuits using IC.

Course Name & Code: Fundamentals of Information Technology-23BCE1S1	
CO1	Learn the basics of computer, Construct the structure of the required things in computer, learn how to use it.
CO2	Develop organizational structure using for the devices present currently under input or output unit.
CO3	Concept of storing data in computer using two header namely RAM and ROM with different types of ROM with advancement in storage basis.
CO4	Work with different software, Write program in the software and applications of software.
CO5	Usage of Operating system in information technology which really acts as a interpreter between software and hardware.
Course Name & Code: Problem Solving Techniques-23BCE1FC	
CO1	Study the basic knowledge of Computers. Analyze the programming languages.
CO2	Study the data types and arithmetic operations. Know about the algorithms. Develop program using flow chart and pseudocode.
CO3	Determine the various operators. Explain about the structures. Illustrate the concept of Loops
CO4	Study about Numeric data and character-based data. Analyze about Arrays.
CO5	Explain about DFD Illustrate program modules. Creating and reading Files

Semester II	
Course Name & Code: தமிழ்இலக்கியவரலாறு - II - 2321T	
CO1	**சிற்றிலக்கியங்களின் வழி இலக்கியச் சுவையினையும் பண்பாட்டின் அறிவினையும் பெறுவர்.**
CO2	**புதுக்கவிதை வரலாற்றினை அறிந்து கொள்வர்.**
CO3	**திராவிடஇயக்க இலக்கியங்களைக் கற்பதன் மூலம் மொழிஉணர்வு, இன உணர்வு, சமத்துவம் சார்ந்த சிந்தனையைப் பெறுவர்.**
CO4	**தமிழ் மொழியைப் பிழையின்றி எழுதவும் புதிய கலைச் சொற்களை உருவாக்கும் அறிந்து கொள்வர்.**
CO5	**போட்டித்தேர்வுகளில் வெற்றி பெறுவதற்குத் தமிழ் பாடத்தினைப் பயன் கொள்ளும் வகையில் பயிற்சி பெறுவர்.**
Course Name & Code: General English – II - 2312E	
CO1	Realize the importarice of resilience.
CO2	Become good decision-makers.
CO3	Imbibe problem-solving skills
CO4	Use tenses appropriately
CO5	Use English effectively at the work place.
Course Name & Code: Object Oriented Programming Concepts using C++ - 23BCE2C1	
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)
CO3	Apply the programming principles learnt in real-time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases
Course Name & Code: Practical-II Object Oriented Programming Concepts using C++ Lab – 23BCE2P1	
CO1	Remember the program structure of C with its syntax and semantics
CO2	Understand the programming principles in C (data types, operators, branching and looping, arrays, functions, structures, pointers and files)

CO3	Apply the programming principles learnt in real time problems
CO4	Analyze the various methods of solving a problem and choose the best method
CO5	Code, debug and test the programs with appropriate test cases
Course Name & Code: Multimedia and its Applications -23BITA4	
CO1	Understand the multimedia usage and text elements
CO2	Understand the Image and sound elements of multimedia
CO3	Understand Animation and video recording formats
CO4	Understand the requirements to create the multimedia application
CO5	Understand to create the animation using Adobe animate
Course Name & Code: Multimedia Lab – 23BITAP4	
CO1	Students can create the Animation.
CO2	Students can add sound effects
Course Name & Code: Office Automation – 23BCE2S1	
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.
Course Name & Code: Introduction to HTML – 23BCE2S2	
CO1	Knows the basic concept in HTML Concept of resources in HTML
CO2	Knows Design concept. Concept of Meta Data Understand the concept of save the files.
CO3	Understand the page formatting. Concept of list
CO4	Creating Links. Know the concept of creating link to email address
CO5	Concept of adding images, Understand the table creation.

Semester III	
Course Name & Code: தமிழகவரலாறும்பண்பாடும்-2331T	
CO1	**தமிழக வரலாற்றை அறிந்துகொள்வர்.**
CO2	**தமிழரின் தொன்மையை அறிவர்.**
CO3	**தமிழரின் பண்பாட்டினை அறிந்துகொள்வர்.**
CO4	**பிற பண்பாட்டுத்தாக்கம் ஏற்படும் முறையினை அறிவர்.**
CO5	**தமிழரின் வரலாற்றுத் தொன்மையையும் பண்பாட்டு பழமையையும் அறிந்து கொள்வர்.**
Course Name & Code: General English -III-2332E	
CO1	Listen actively
CO2	Develop interpersonal relationship skills
CO3	Acquire self - confidence to cope with stress
CO4	Master grammar skills
CO5	Carryout business communication effectively
Course Name & Code: Data Structure and Algorithms-23BCE3C1	
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation
CO2	Understand basic data structures such as arrays, linked lists, stacks and queues
CO3	Describe the hash function and concepts of collision and its resolution methods
CO4	Solve problem involving graphs, trees and heaps
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
Course Name & Code: Data Structure and Algorithms Lab-23BCE3P1	
CO1	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation

CO2	Understand basic data structures such as arrays, linked lists, stacks and queues
CO3	Describe the hash function and concepts of collision and its resolution methods
CO4	Solve problem involving graphs, trees and heaps
CO5	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
Course Name & Code: Discrete Mathematics-23BCAA3	
CO1	Remember the fundamental concepts of set theory, functions and relations.
CO2	Understand the mathematical formulation Conditional Statements, Atomic and Compound Statements.
CO3	Describe the concept and Principles of Normal Forms, Theory of Inference.
CO4	Analyze and classify the insights of graph theory.
CO5	Understand the use trees and Boolean algebra.
Course Name & Code: Excel & C++ Lab for Discrete Mathematics -23BCAAP3	
CO1	Remember the truth table using spreadsheets.
CO2	Understand the programming basic function and knowledge about solving Logical problems.
CO3	Apply the programming concept of spreadsheets for demorgan's theorem.
CO4	Analyze the various set operations and problem.
CO5	Know to demonstrate and implement prim's algorithms.
Course Name & Code: Web Designing-23BCE3S1	
CO1	Develop working knowledge of CSS
CO2	Ability to Develop and publish Web pages using DHTML.
CO3	Ability to optimize page styles and layout with Cascading Style Sheets (CSS).
CO4	Ability to develop a java script
CO5	An ability to develop web application using Ajax.
Course Name & Code: Multimedia Systems -23BCE3S2	
CO1	Understand the concepts, importance, application and the process of developing multimedia
CO2	To have basic knowledge and understanding about image related processings
CO3	To understand the framework of frames and bit images to animations
CO4	Speaks about the multimedia projects and stages of requirement in phases of project.
CO5	Understanding the concept of cost involved in multimedia planning, designing, and producing

Semester IV	
Course Name & Code: Tamilum Ariviyalum -2341T	
CO1	**தாய்மொழி வழியாக அறிவியல் பற்றி சிந்தித்து செயலாற்றும் திறன் பெற்றிருப்பர்.**
CO2	**தாய்மொழி வழியாக அறிவியல் பற்றி சிந்திக்கவும் செய்திருப்பர்.**
CO3	**அறிவியல் கலைச் சொல்லாக்கம் பற்றி அறிய செய்வர்.**
CO4	**அறிவியல் தொழில் நுட்பத்தின் வளர்ச்சி பற்றி அறிந்திருப்பர்.**
CO5	**அறிவியல் வளர்ச்சியில் தகவல் தொழில்நுட்பத்தின் பங்கு பற்றி அறிந்து கொள்ளுதல்.**
Course Name & Code: General English-IV -2342E	
CO1	Determine their goals
CO2	Identify the value of integrity.
CO3	Deal with emotions.
CO4	Frame grammatically correct sentences
CO5	Write cohesive reports.
Course Name & Code: Java Programming -23BCE4C1	
CO1	Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.
CO2	Implement inheritance, packages, interfaces and exception handling of Core Java.

CO3	Implement multi-threading and I/O Streams of Core Java
CO4	Implement AWT and Event handling.
CO5	Use Swing to create GUI.
Course Name & Code: Java Programming Lab -23BCE4P1	
CO1	Understand the basic Object-oriented concepts. Implement the basic constructs of Core Java.
CO2	Implement inheritance, packages, interfaces and exception handling of Core Java.
CO3	Implement multi-threading and I/O Streams of Core Java
CO4	Implement AWT and Event handling.
CO5	Use Swing to create GUI.
Course Name & Code: Graph Theory and its Applications – 23BCAA5	
CO1	To Introduce the fundamental concepts in graph theory Graphs, subgraphs, walks, Euler graphs, Hamiltonian Paths Tree Properties, Hamiltonian paths and circuits.
CO2	Understanding the concepts of Circuits, Cut set and its Properties, Network Flows, Isomorphism and Combinatorial and Planar Graphs.
CO3	Applying the concept of Colouring with Chromatic Number, Directed Graphs, Matching, Covering Pattern and Euler Graphs.
CO4	Analyzing the Various Concepts of Representation of Graphs, Euler Paths Circuit, Kruskals and Prims Algorithms, Connected Components.
CO5	Implementation of an application using All Types of Graphs and evaluate the Applications with travelling sales person Problem, K colour Problem with n vertices in a Graph and Shortest Path finding Problem using Directed and Undirected Graphs.
Course Name & Code: Graph Theory and its applications Lab – 23BCAAP5	
CO1	To Introduce the fundamental concepts in graph theory Graphs, sub graphs, walks, Euler graphs, Hamiltonian Paths Tree Properties, Hamiltonian paths and circuits.
CO2	Applying the concept of Colouring with Chromatic Number, Directed Graphs, Matching, Covering Pattern and Euler Graphs.
CO3	Analysing the Various Concepts of Representation of Graphs, Euler Paths Circuit, Kruskals and Prims Algorithms, Connected Components.
CO4	Implementation of an application using All Types of Graphs and evaluate the Applications with travelling sales person Problem, K colour Problem etc.
CO5	To Introduce the fundamental concepts in graph theory Graphs, subgraphs, walks, Euler graphs, Hamiltonian Paths Tree Properties, Hamiltonian paths and circuits.
Course Name & Code: PHP Programming – 23BCE4S1	
CO1	Write PHP scripts to handle HTML forms
CO2	Write regular expressions including modifiers, operators, and metacharacters.
CO3	Create PHP Program using the concept of array.
CO4	Create PHP programs that use various PHP library functions
CO5	Manipulate files and directories.
Course Name & Code: Software Testing – 23BCE4S2	
CO1	Students learn to apply software testing knowledge and engineering methods
CO2	Have an ability to identify the needs of software test automation, and define and develop a test tool to support test automation.
CO3	Have an ability understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
CO4	Have basic understanding and knowledge of contemporary issues in software testing, such as component-based software testing problems
CO5	Have an ability to use software testing methods and modern software testing tools for their testing projects.

Semester V	
Course Name & Code: Operating Systems – 23BCE5C1	
CO1	Define the fundamentals of OS and identify the concepts relevant to process , process life cycle, Scheduling Algorithms, Deadlock and Memory management
CO2	Know the critical analysis of process involving various algorithms, an exposure to threads and semaphores
CO3	Have a complete study about Deadlock and its impact over OS. Knowledge of handling Deadlock with respective algorithms and measures to retrieve from deadlock. .
CO4	Have complete knowledge of Scheduling Algorithms and its types.
CO5	Understand memory organization and management
Course Name & Code: Database Management System – 23BCE5C2	
CO1	Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity-Relationship Model.
CO3	Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)
CO4	Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.
CO5	Learn to design Data base operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions
Course Name & Code: Database Management System Lab – 23BCE5P1	
CO1	Understand the various basic concepts of Data Base System. Difference between file system and DBMS and compare various data models.
CO2	Define the integrity constraints. Understand the basic concepts of Relational Data Model, Entity Relationship Model.
CO3	Design database schema considering normalization and relationships within database. Understand and construct database using Structured Query Language. Attain a good practical skill of managing and retrieving of data using Data Manipulation Language (DML)
CO4	Classify the different functions and various join operations and enhance the knowledge of handling multiple tables.
CO5	Learn to design Data base operations and implement using PL/SQL programs. Learn basics of PL/SQL and develop programs using Cursors, Exceptions
Course Name & Code: Software Engineering – 23BCE5C3	
CO1	Gain basic knowledge of analysis and design of systems
CO2	Ability to apply software engineering principles and techniques
CO3	Model a reliable and cost-effective software system
CO4	Ability to design an effective model of the system
CO5	Perform Testing at various levels and produce an efficient system.
Course Name & Code: Artificial Intelligence – 23BCE5E1	
CO1	Understand the various concepts of AI Techniques.
CO2	Understand various Search Algorithm in AI.
CO3	Understand probabilistic reasoning and models in AI

CO4	Understand Markov Decision Process.
CO5	Understand various type of Reinforcement learning Techniques.
Course Name & Code: Introduction to Data Science - 23BCE5E3	
CO1	Understand the basics in Data Science and Big data.
CO2	Understand overview and building process in Data Science.
CO3	Understand various Algorithms in Data Science.
CO4	Understand Hadoop Framework in Data Science.
CO5	Case study in Data Science.
Semester VI	
Course Name & Code: Computer Networks – 23BCE6C1	
CO1	To Understand the basics of Computer Network architecture, OSI and TCP/IP reference models
CO2	To gain knowledge on Telephone systems using wireless network
CO3	To understand the concept of MAC
CO4	To analyze the characteristics of Routing and Congestion control algorithms
CO5	To understand network security and define various protocols such as FTP, HTTP, Telnet, DNS
Course Name & Code: Dissertation - 23BCE6D	
CO1	Be able to recognize the technological recent trends of computer science.
CO2	Students will gain knowledge about technological components of the software
Course Name & Code: Python programming - 23BCE6E2	
CO1	Learn the basics of python, do simple programs on python, Learn how to use an array.
CO2	Develop program using selection statement, Work with Looping and jump statements, do programs on Loops and jump statements.
CO3	Concept of function, function arguments, Implementing the concept strings in various application, Significance of Modules, Work with functions, Strings and modules.
CO4	Work with List, tuples and dictionary, Write program using list, tuples and dictionary.
CO5	Usage of File handlings in python, Concept of reading and writing files, Do programs using files.
Course Name & Code: Computer Graphics - 23BCE6E3	
CO1	Able To make students understand the basic concepts of Computer Graphics.
CO2	Understand about the Graphics output primitives.
CO3	Know about the attributes of output primitives.
CO4	Understand the concept of two-dimensional transformation
CO5	Know about the concept of two-dimensional Viewing
Course Name & Code: Essential Reasoning and Quantitative Aptitude – 23BCE6S1	
CO1	Apply fundamental mathematical operations to solve problems related to simplifications and averages efficiently using short-cut methods for improved accuracy and speed.
CO2	Demonstrate a thorough understanding of profit & loss and time & work concepts to solve problems with precision using optimized methods and strategies.
CO3	Distinguish between simple and compound interest concepts and apply appropriate methods to solve financial problems.
CO4	Develop reasoning skills to solve problems involving analogy, coding-decoding, directions, distances, and blood relations.
CO5	Interpret and evaluate data sufficiency problems using logical and analytical reasoning techniques.