COURSES OUTCOME

B.Sc. COMPUTER SCIENCE

Semester I

PROGRAMMING IN C **SUBJECT CODE: U2CSC11**

In this course, the students will

CO1:	Identify the process of problem solving using computer and design an algorithmic solution.
CO2:	Understand the logical flow of simple and complex computation.
CO3:	Know data storage and retrieval to/from memory location.
CO4:	Appreciate programming with statements and constructs.
CO5:	Realize how data can be grouped together as a single unit, stored, processed, retrieved using structures and file concepts.

MATHEMATICAL FOUNDATION 1 **SUBJECT CODE: U2MAA1C**

In this course, the students will

CO1:	Apply the rules of propositional logic and rules of inference in verifying the validity of an argument.
CO2:	Develop skills in logic reasoning.
CO3:	Use basic counting techniques in solving some real time problems.
CO4:	Know the basic definitions in Graph theory.
CO5:	Use mathematical definitions to identify and construct examples.
CO6:	Describe and solve some real time problems using concepts of Graph Theory.
CO7:	Apply graph as models for many problems.
CO8:	Solve simultaneous equations using matrices.

LAB: C PROGRAMMING **SUBJECT CODE: U2CSC1P**

In this course, the students will

CO1:	Enhance the analyzing and problem solving skills and use the same for writing programs in C.
CO2:	Write diversified solutions, draw flowcharts and develop a well-documented and indented program according to coding standards.
CO3:	Learn to debug a given program and execute the C program.

CO4:	To have enough practice the use of conditional and looping statements
CO5:	To implement arrays, functions and pointers.
CO6:	Gain skills to handle strings and data files.

DIGITAL PRINCIPLES AND APPLICATIONS **SUBJECT CODE: U1CSS1**

In this course, the students will

CO1:	Establish a strong foundation knowledge of digital computing circuits and its working principles
CO2:	Provides in-depth coverage of Boolean algebra, Number systems, Combinational logic circuit design concepts and sequential logic circuit design concepts
CO3:	Give a wide exposure to Complement arithmetic, Adder circuit design and its significance role in designing the ALU of a digital computer
CO4:	Give a substantial treatment to Flip Flop design and its role in designing the registers of a digital computer

Semester II

OBJECT ORIENTED PROGRAMMING IN C++ **SUBJECT CODE: U1CSC21**

In this course, the students will

CO1:	Comprehend the difference between procedure-oriented and object-oriented programming paradigms with the concepts of steams, classes, functions, data and objects.
CO2:	Know the features of the C++ programming language such as data abstraction, information hiding, virtual functions and dynamic binding.
CO3:	Understand the advantages of reusability code/data using polymorphism and inheritance concepts in software development.
CO4:	Enhance their knowledge with simple programming projects to demonstrate the use of various OOP concepts.

MATHEMATICAL FOUNDATION II **SUBJECT CODE: U3MAA2C**

In this course, the students will

CO1:	Classify, tabulate, and graphically represent a given statistical data.
CO2:	Calculate the basic statistical parameters (measures of dispersion, moments,

	coefficient of skewness and kurtosis)
CO3:	Perform correlation analysis and interpret the result.
CO4:	Know the concept of probability and aware of its applications in real time problems.
CO5:	Perform test of mHypothesis and calculate confidential limit of a population.
CO6:	Use appropriate statistical tools and sampling techniques in handling real life problems.

LAB: C++ PROGRAMMING **SUBJECT CODE: U2CSC2P**

In this course, the students will

CO1:	Learn the programming aspects of data abstraction and information hiding, inheritance, and dynamic binding.
CO2:	Understand the process of writing, compiling and executing programs in C++ using appropriate predefined functions in C++.
CO3:	Comprehend the concept of pointers and advanced use of arrays in C++ programming.
CO4:	Develop applications in C++ using the understanding of Inheritance and polymorphism.
CO5:	Understand stream I/O, Files and usage of the available classes to handle stream objects in C++ language.
CO6:	Be able to develop complex applications by identifying the appropriate features of object oriented programming to solve real world problems using C++.

COMPUTER ORGANIZATION **SUBJECT CODE: U1CSS2**

In this course, the students will

CO1:	Pave the way to know how the various digital components are organized together to form a digital computing hardware
CO2:	Deal with computer architecture as well as computer organization
CO3:	Give a deep insight into the design of control unit organization which is the vital part of a digital computer
CO4:	Provide fundamentals about different types of CPU organizations
CO5:	Emphasize on Input/output organization highlighting interfaces and IO transfer techniques

CO6:	Give an exhaustive coverage to memory organization and types

Semester III

JAVA PROGRAMMING **SUBJECT CODE: U2CSC31**

In this course, the students will

CO1:	Introduce Object Oriented Programming approach in computing and deals with core Java fundamentals
CO2:	Make the students understand how java language is more simpler & powerful than C language
CO3:	Develop skills in covers the core Java features, Java Evolution, its data types and control structures.
CO4:	Introduce the concepts of Array, Vector and String manipulations are revealed here
CO5:	Provide the programming fundamentals of Threads and Files usage
CO6:	Give an in depth exception handling in java programming language

LAB: PROGRAMMING IN JAVA **SUBJECT CODE: U2CSC3P**

In this course, the students will

CO1:	Gain the elementary programming knowledge in object oriented paradigm
CO2:	Practice core java fundamentals in command user interface
CO3:	The concepts like polymorphism, inheritance and reusability
CO4:	The complex concepts like multi-threading and exception handling
CO5:	The lab also gives practice treatment with file manipulation in java

DATA STRUCTURES **SUBJECT CODE: U2CSC32**

In this course, the students will

CO1:	Understand the basic concepts of different types and structure of data
CO2:	Know the different ways of storage representations in memory for each data type.
CO3:	Analyse the ways of implementing data structures using pointers.
CO4:	Study the Operations to be carried out on arrays, linked lists, stacks, queues, lists, trees, heaps, tables and graphs.
CO5:	Apply Algorithms to solve problems like sorting, searching, insertion and deletion of data.

CO6:	Understand the need for Dynamic memory management in writing efficient programs.
CO7:	Implement the applications of data structures in compiler design and gaming.

RESOURCE MANAGEMENT TECHNIQUES **SUBJECT CODE: U2MAA3C**

In this course, the students will

CO1:	Define the origin, development, phases and scope of operations research.
CO2:	Formulate the given problem as linear programming problem and solve it by graphical method.
CO3:	Apply simplex method to solve the linear programming problem.
CO4:	Construct the dual to given primal and solve it by Simplex method.
CO5:	Solve the Assignment problem as a special case of Linear programming problem to optimize the cost.
CO6:	Find the initial basic feasible solution to the Transportation problem.
CO7:	Formulate the given problem as linear programming problem and solve it by graphical method.

Semester IV

ADVANCED JAVA PROGRAMMING **SUBJECT CODE: U2CSC41**

In this course, the students will

CO1:	Give an introduction about GUI programming, Client scripting and Server scripting
CO2:	Provide knowledge about Applet and Graphics programming concepts
CO3:	Give a thorough knowledge about AWT- Event based GUI programming
CO4:	Give a wide coverage to Network Socket programming as well as RMI application development in java
CO5:	Give a comprehensive study about server programming using Java Servlets

LAB: PROGRAMMING IN ADVANCED JAVA **SUBJECT CODE: U2CSC4P**

In this course, the students will

CO1:	Give practical exposure that makes transition from Command user interface to Graphical user interface
CO2:	Draw graphics and animations using Applet container

CO3:	To carry out the event programming concept using AWT container
CO4:	Explore java socket programming to carry out simple networking applications
CO5:	Treat the remote procedure call with Java RMI programming
CO6:	Give an emphasize on Servlet programming which forms the foundation knowledge of Server Scripting

OPERATING SYSTEMS **SUBJECT CODE: U2CSC42**

In this course, the students will

CO1:	Understand the various types of resources present in the computer system.
CO2:	Know how the computer resources are efficiently utilized with respect to space and time using algorithms.
CO3:	Realize the significance of data transfer mechanisms between computer resources.
CO4:	Become confident in designing a simple operating system.
CO5:	Understand the functions of Operating System in Windows and Unix.
CO6:	Know about CPU scheduling and memory management techniques.
CO7:	Comprehend disk management algorithms for better utilization of external memory.
CO8:	Recognize file system and security mechanisms.

NUMERICAL METHODS **SUBJECT CODE: U2MAA4C**

In this course, the students will

CO1:	Identify the roots of algebraic and transcendental equations.
CO2:	Solve the system of simultaneous linear equations using Direct and iterative method.
CO3:	Construct interpolating polynomials to identify the missing value in the given data.
CO4:	Find the derivatives of an unknown function numerically.
CO5:	Apply Newton cote's quadrature formula to solve problems in numerical integration.
CO6:	Solve the differential equations numerically using single and multiple methods.

Semester V

COMPUTER ALGORITHMS **SUBJECT CODE: U2CSC51**

In this course, the students will

CO1:	To develop efficient programs in terms of execution time and memory space.
CO2:	Analyze the developed programs to compute order of computing time.
CO3:	To develop programs based on the Algorithmic techniques namely Divide and conquer, Dynamic programming, Greedy method, Backtracking and Branch and Bound.
CO4:	Know the importance of minimizing computing time and how these algorithmic techniques make the program execution faster.

Lab: PHP AND MYSQL **SUBJECT CODE: U1CSC5P1**

In this course, the students will

CO1:	To describe the PHP scripting language, and create basic PHP scripts using proper PHP syntax.
CO2:	To create elaborate scripts, write HTML forms, and program PHP to handle the form data.
CO3:	How to use PHP to create dynamic Web sites that are responsive to users and can alter content based on differing situations.
CO4:	Develop the competence to create databases and tables, and sort and retrieve data using SQL and MySQL.
CO5:	Understand the usage of PHP and MySQL in dynamic web development.
CO6:	Enrich the knowledge of PHP language data types, logic controls, built-in and user-defined functions.
CO7:	Make the students learn how to write server-side Web applications.
CO8:	Gain the PHP programming skills needed to build interactive, data-driven sites successfully
CO9	Explore working with form data using cookies and sessions.

Lab: DOT NET PROGRAMMING **SUBJECT CODE: U1CSC5P2**

In this course, the students will

CO1:	Educate the students about VB. Dot Net programming methods, tools to techniques.
CO2:	Gain the Practical on object oriented concepts, VB. Net platform.
CO3:	Acquire the ability in string processing and array handling exposed them the processing and structurization concepts in VB.Net.

ELECTIVE: EMBEDDED SYSTEM **SUBJECT CODE: U1CSE51**

In this course, the students will

CO1:	Give exposure to fundamentals of Embeded System which forms the core of all IOT applications
CO2:	Provide a deep insight into software and hardware of embedded systems
CO3:	Deals with serial IO, parallel IO, Timers, counters and their significance in embedded applications in hardware perspective in software perspective.
CO4:	In software perspective, the subject deals with embedded programming concepts in C
CO5:	Cover the foundation knowledge of embedded operating system, RTOS

COMPUTER NETWORKS **SUBJECT CODE: U2CSE52**

In this course, the students will

CO1:	Provide foundation knowledge of Network Hardware and Network Software
CO2:	Give an in-depth knowledge about ISO/OSI and TCP/IP protocol stacks
CO3:	Classify type of media and IEEE LAN standards
CO4:	Present various types of error handling mechanisms
CO5:	Gain Knowledge on routing algorithms as well as application layer functions

DATA MINING **SUBJECT CODE: U2CSE53**

In this course, the students will

CO1:	Understand the essentials of database and knowledge base.
CO2:	Analyze the architecture of data mining and its components educated.
CO3:	Inculcate the effective ways of data pre-processing educated to students.
CO4:	Make the students know the importance association mining educated to students.

CO5:	Learn the essentials of classification mining
CO6:	Impart the knowledge on cluster mining and different clustering techniques.
CO7:	Elaborate text mining, spatial mining, web mining etc.

DATABASE MANAGEMENT SYSTEMS **SUBJECT CODE: U2CSE54**

In this course, the students will

CO1:	Educate the students on the essentials of database and database components.
CO2:	The architecture of database and the languages used to maintain DBMS was educated.
CO3:	To find the effective ways of modelling a database.
CO4:	To recognize the importance of relational data models and its operation educated.
CO5:	To acquire the knowledge on relational algebra and relational calculus to know the procedural and declarative ways of manipulating of database.
CO6:	To enrich the students on functional dependencies and the different ways of normalizing a database.
CO7:	Create awareness the students on effectively protecting the database by giving exposure of on transaction processing, concurring control techniques and database security.
CO8:	Make the students aware of the fundamentals of database and its effective management.

ELECTIVE: INFORMATION SECURITY **SUBJECT CODE: U1CSE55**

In this course, the students will

CO1:	Give the foundation of information security and its underlying technologies
CO2:	Provide a wide coverage of the issues and attacks in information security
CO3:	Learn how to deal with security analysis and design pertaining to information security
CO4:	Enumerate the logical and physical design of information security systems

ELECTIVE: CLOUD COMPUTING **SUBJECT CODE: U2CSE56**

In this course, the students will

CO1:	Subject establishes a strong foundation knowledge of Cloud Computing architecture and deployment models.
CO2:	Subject provides in-depth coverage of Cloud Virtualization, Security issues and challenges.
CO3:	Subject gives a detail exposure to present web services and the ways of accessing the cloud.
CO4:	Also the subject establishes a wide coverage to cloud computing applications and its mobile counterpart.

WEB PROGRAMMING **SUBJECT CODE: U1CSS51**

In this course, the students will

CO1:	Acquire the knowledge able to download, install, configure, and test all the software required to create dynamic websites using PHP and MySQL.
CO2:	To apply the knowledge to the creation of dynamic Web applications such as content management
CO3:	Build a simple, yet functional web application using PHP/MySQL.
CO4:	Practice the operations such as select, insert, update and delete data using SQL language.
CO5:	Learn to create a powerful, open, and free platform for developing database-driven Web sites.

COMPUTER FUNDAMENTALS **SUBJECT CODE: U2CSN51**

In this course, the students will

CO1:	Define the fundamentals of computer.
CO2:	Acquire the knowledge of basic computer architecture and the generations of computer.
CO3:	Enhance the students on number system and conversions of numbers in binary to octal, hexadecimal, and vice versa.
CO4:	Know the importance of different computer peripherals.
CO5:	Describe the principles of programming and operating systems.

CO6:	Elaborate the students on the tools and different utility software in computers.

Semester V

SOFTWARE ENGINEERING **SUBJECT CODE: U2CSC61**

In this course, the students will

CO1:	Know the different approaches of developing an efficient software.
CO2:	Facilitate the knowledge of technological and managerial aspect of incorporating software.
CO3:	Aware the development of process of software.
CO4:	Develop the skills in cost estimation.
CO5:	Learn how to fulfill good software requirements specification.
CO6:	Delineate the ways of designing a software product effectively.
CO7:	Understand the different validation and verification techniques of software testing.
CO8:	Know the different ways of maintaining software.
CO9	Develop a wholesome approach to define and develope qualitative software.

COMPUTER GRAPHICS **SUBJECT CODE: U2CSC62**

In this course, the students will

CO1:	Understand the basics of computer graphics, graphics systems and applications of computer graphics.
CO2:	Know about geometric transformations on graphics objects and their application in composite form and animation of objects.
CO3:	Learn the basic principles and implementation logic of graphics primitives.
CO4:	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
CO5:	Develop the competence of the students in projecting objects to naturalize the scene in 2D view and to create illumination models.

MOBILE COMPUTING **SUBJECT CODE: U2CSC63**

In this course, the students will

CO1:	Provide a detailed coverage of mobile computing and communication aspects
CO2:	Learn how to treat Mobile transport and network protocols

CO3:	Give an exhaustive coverage to MANET and WSN
CO4:	Deal with mobile application development as well as types of mobile OS

SOFTWARE DEVELOPMENT **SUBJECT CODE: U2CSC6PR**

In this course, the students will

CO1:	Train the students to develop projects effectively.
CO2:	Give the students an in depth knowledge of developing structured software programming techniques.
CO3:	Exposure the students to pointer programming, file based approaches and usage of language structures.
CO4:	Give the students the knowledge of developing web designing applications and android based programming applications.

LAB: ANDROID APPLICATIONS DEVELOPMENT SUBJECT CODE: U2CSC6P2

In this course, the students will

CO1:	Practice to develop Android Application in the open source environment using eclipse.
CO2:	Develop the App with the layout linear, relative, table and frame.
CO3:	Know how to use intents, on Click events, list View, alert dialog notification and status bar notification.
CO4:	Learn to handle database in the App.

ANDROID PROGRAMMING **SUBJECT CODE: U2CSS61**

In this course, the students will

CO1:	Develop Mobile Application based on open source software.
CO2:	Learn to use widgets in linear layout and relative layout.
CO3:	Apply style and theme.
CO4:	Use menu, submenu and shortcut for the menus.
CO5:	Handle Dialog box, toast and status bar.
CO6:	Develope app with security feature.
CO7:	Use database in the App.

SYSTEM SOFTWARE **SUBJECT CODE: U1CSS62**

In this course, the students will

CO1:	Understand the different types of machine architecture
CO2:	Appreciate the relationship between machine architecture and systems software.
CO3:	Apprehend the formats and operation codes of machine instructions.
CO4:	Know the basic assembler features and different formats of assembly level instructions.
CO5:	Appreciate the design options of loader, assembler, and macro processors.

INTRODUCTION TO HTML **SUBJECT CODE: U2CSN61**

In this course, the students will

CO1:	Understand the fundamental technology used to define the structure of a webpage.
CO2:	Appreciate the client side and server side web programming.
CO3:	Design an own simple homepage using HTML Tags.
CO4:	Realize how to design web pages easily using advanced HTML concepts.

Self Learning Course: MICROCONTROLLERS AND EMBEDDED SYSTEM DEVELOPMENT IN C **SUBJECT CODE: U1CSSL51**

In this course, the students will

CO1:	Give the basic knowledge about microcontroller and its programming
CO2:	Explores the architecture of Intel 8051 microcontroller and its on-chip peripherals
CO3:	Introduce 8051 microcontroller programming in C and its basics
CO4:	Provide an in depth treatment to Parallel IO programming
CO5:	Learn treat serial port programming, timer programming and interrupts programming in C
CO6:	Obtain the knowledge of Microcontroller programming.

M.PHIL PROGRAM OUTCOMES

RESEARCH METHODOLOGY **SUBJECT CODE: M2CSC11**

In this course, the students will

CO1:	Know the research objectives and various research approaches.
CO2:	Impart the knowledge of the research designs and its importance.
CO3:	Make the scholars Understand the importance of sampling.
CO4:	Know how to prepare Report writing.
CO5:	Use Latex software to prepare research report.
CO6:	Handle Mathlab and to write M-File scripts.

DATA MINING **SUBJECT CODE: M1CSC12**

In this course, the students will

CO1:	Educate the scholars the concepts of data mining and its research impact.
CO2:	Give exposure to different data pre-processing techniques.
CO3:	Define the students on the key areas of data mining, association mining, classification mining and cluster mining.
CO4:	Focus latest areas of data mining and applications for research.

ARTIFICIAL NEURAL NETWORKS **SUBJECT CODE: M3CSE11**

In this course, the students will

CO1:	Know the usage of neural networks.
CO2:	Develop the architecture of feed forward neural network and feedback neural networks.
CO3:	Know how to train the neural networks in supervised and unsupervised mode.
CO4:	Apply Associative memory, counter propagation network, self organizing map and cluster discovery network.
CO5:	The methods of the network particularly back propagation algorithm.

VIRUDHUNAGAR HINDU NADARS' SENTHIKUMARA NADAR COLLEGE
(An Autonomous Institution Affiliated to Madurai Kamaraj University)
[Re-accredited with 'A' Grade by NAAC]
Virudhunagar – 626 001.

DIGITAL IMAGE PROCESSING **SUBJECT CODE: M2CSE12**

In this course, the students will

CO1:	Subject establishes a strong research foundation knowledge of digital image processing.
CO2:	Subject provides in-depth coverage of research methodologies pertaining to digital image processing.
CO3:	Subject gives a detail exposure to image transformations and filtering techniques.
CO4:	Also the subject gives a substantial treatment to segmentation and object recognition.
CO5:	Subject provides strong idea of identifying research problems and techniques in digital image processing.