



### B.Sc Computer Science - Program Specific Outcomes

On successful completion of B.Sc Computer Science Programme, the students will

<b>PSO1:</b>	Gain theoretical knowledge pertaining to Computer Science domain
<b>PSO2:</b>	Apply skills include Procedure oriented programming, Object oriented programming, Network programming, Server programming and Mobile programming, Command line user interface and Graphical user interface
<b>PSO3:</b>	Establish a strong foundation knowledge in computer science and information technology
<b>PSO4:</b>	Acquire an incessant delivery of knowledge from the basics to well advanced theoretical concepts
<b>PSO5:</b>	Posses the knowledge on Computer Hardware by means of the subjects like Digital Principles & applications, Computer Organization and Computer Networks
<b>PSO6:</b>	Get an exposure to Computer Software and processing techniques with the aid of subjects like Operating Systems, Data Structures, Algorithms, Database Management System and Software Engineering
<b>PSO7:</b>	Have an in-depth practical knowledge by means of C, Java, J2EE, VB.NET, PHP and Android programming labs.
<b>PSO8:</b>	Apply the knowledge attained in problem solving and application program development

### COURSES OUTCOME - B.Sc COMPUTER SCIENCE

#### I B.Sc – Semester I

#### PROGRAMMING IN C

**SUBJECT CODE: U2CSC11**

In this course, the students will

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



## DIGITAL PRINCIPLES AND APPLICATIONS

**SUBJECT CODE: U1CSS1**

In this course, the students will

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

## LAB: C PROGRAMMING

**SUBJECT CODE:**

In this course, the students will

<b>CO1:</b>	Enhance the analyzing and problem solving skills and use the same for writing programs in C.
<b>CO2:</b>	Write diversified solutions, draw flowcharts and develop a well documented and indented program according to coding standards.
<b>CO3:</b>	Learn to debug a given program and execute the C program.
<b>CO4:</b>	To have enough practice the use of conditional and looping statements
<b>CO5:</b>	To implement arrays, functions and pointers.
<b>CO6:</b>	Gain skills to handle strings and data files

## MATHEMATICAL FOUNDATION 1

**SUBJECT CODE: U2MAA1C**

In this course, the students will

<b>CO1:</b>	Apply the rules of propositional logic and rules of inference in verifying the validity of an argument.
<b>CO2:</b>	Develop skills in logic reasoning.
<b>CO3:</b>	Use basic counting techniques in solving some real time problems.
<b>CO4:</b>	Know the basic definitions in Graph theory.
<b>CO5:</b>	Use mathematical definitions to identify and construct examples.
<b>CO6:</b>	Describe and solve some real time problems using concepts of Graph Theory.



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<b>CO7:</b>	Apply graph as models for many problems.
<b>CO8:</b>	Solve simultaneous equations using matrices.

## Semester II

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

In this course, the students will

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

### COMPUTER ORGANIZATION

SUBJECT CODE: U1CSS2

In this course, the students will

<b>CO1:</b>	Pave the way to know how the various digital components are organized together to form a digital computing hardware
<b>CO2:</b>	Deal with computer architecture as well as computer organization
<b>CO3:</b>	Give a deep insight into the design of control unit organization which is the vital part of a digital computer
<b>CO4:</b>	Provide fundamentals about different types of CPU organizations
<b>CO5:</b>	Emphasize on Input/output organization highlighting interfaces and IO transfer techniques
<b>CO6:</b>	Give an exhaustive coverage to memory organization and types

### LAB: C++ PROGRAMMING

SUBJECT CODE:

In this course, the students will

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

## MATHEMATICAL FOUNDATION II

**SUBJECT CODE: U3MAA2C**

In this course, the students will

<b>CO1:</b>	Classify, tabulate, and graphically represent a given statistical data.
<b>CO2:</b>	Calculate the basic statistical parameters (measures of dispersion, moments, coefficient of skewness and kurtosis)
<b>CO3:</b>	Perform correlation analysis and interpret the result.
<b>CO4:</b>	Know the concept of probability and aware of its applications in real time problems.
<b>CO5:</b>	Perform test of mHypothesis and calculate confidential limit of a population.
<b>CO6:</b>	Use appropriate statistical tools and sampling techniques in handling real life problems.

## Semester III

### JAVA PROGRAMMING

**SUBJECT CODE:U2CSC31**

In this course, the students will

<b>CO1:</b>	Introduce Object Oriented Programming approach in computing and deals with core Java fundamentals
<b>CO2:</b>	Make the students understand how java language is more simpler & powerful than C language
<b>CO3:</b>	Develop skills in covers the core Java features, Java Evolution, its data types and control structures.



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<b>CO4:</b>	Introduce the concepts of Array, Vector and String manipulations are revealed here
<b>CO5:</b>	Provide the programming fundamentals of Threads and Files usage
<b>CO6:</b>	Give an in depth exception handling in java programming language

## DATA STRUCTURES

**SUBJECT CODE:U2CSC32**

In this course, the students will

<b>CO1:</b>	Understand the basic concepts of different types and structure of data
<b>CO2:</b>	Know the different ways of storage representations in memory for each data type.
<b>CO3:</b>	Analyse the ways of implementing data structures using pointers.
<b>CO4:</b>	Study the Operations to be carried out on arrays, linked lists, stacks, queues, lists, trees, heaps, tables and graphs.
<b>CO5:</b>	Apply Algorithms to solve problems like sorting, searching, insertion and deletion of data.
<b>CO6:</b>	Understand the need for Dynamic memory management in writing efficient programs.
<b>CO7:</b>	Implement the applications of data structures in compiler design and gaming.

## RESOURCE MANAGEMENT TECHNIQUES

**SUBJECT CODE: U2MAA3C**

In this course, the students will

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



**LAB: PROGRAMMING IN JAVA**

**SUBJECT CODE: U2CSC3P**

In this course, the students will

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

**Semester IV**

**ADVANCED JAVA PROGRAMMING**

**SUBJECT CODE: U2CSC41**

In this course, the students will

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

**OPERATING SYSTEMS**

**SUBJECT CODE: U2CSC42**

In this course, the students will

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

**NUMERICAL METHODS**

**SUBJECT CODE:U2MAA4C**

In this course, the students will

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

**LAB: PROGRAMMING IN ADVANCED JAVA**

**SUBJECT CODE: U2CSC4P**

In this course, the students will

<b>CO1:</b>	Give practical exposure that makes transition from Command user interface to Graphical user interface
<b>CO2:</b>	Draw graphics and animations using Applet container
<b>CO3:</b>	To carry out the event programming concept using AWT container
<b>CO4:</b>	Explore java socket programming to carry out simple networking applications
<b>CO5:</b>	Treat the remote procedure call with Java RMI programming
<b>CO6:</b>	Give an emphasize on Servlet programming which forms the foundation knowledge of Server Scripting

**Semester V**

**COMPUTER ALGORITHMS**

**SUBJECT CODE: U2CSC51**

In this course, the students will

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

**PHP AND MYSQL**

**SUBJECT CODE:**

In this course, the students will

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

**LAB: WEB PROGRAMMING**

**SUBJECT CODE:**

In this course, the students will

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

**DOT NET PROGRAMMING**

**SUBJECT CODE: U1CSC5P2**

In this course, the students will

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



	processing and structurization concepts in VB.Net.
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**ELECTIVE: EMBEDDED SYSTEM**

**SUBJECT CODE: U1CSE51**

In this course, the students will

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

**COMPUTER NETWORKS**

**SUBJECT CODE: U2CSE52**

In this course, the students will

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

**DATABASE MANAGEMENT SYSTEMS**

**SUBJECT CODE: U2CSE54**

In this course, the students will

<b>CO1:</b>	Educate the students on the essentials of database and database components.
<b>CO2:</b>	The architecture of database and the languages used to maintain DBMS was educated.
<b>CO3:</b>	To find the effective ways of modelling a database.
<b>CO4:</b>	To recognize the importance of relational data models and its operation educated.
<b>CO5:</b>	To acquire the knowledge on relational algebra and relational calculus to know the procedural and declarative ways of manipulating of database.
<b>CO6:</b>	To enrich the students on functional dependencies and the different ways of normalizing a database.
<b>CO7:</b>	Create awareness the students on effectively protecting the database by giving



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	exposure of on transaction processing, concurring control techniques and database security.
<b>CO8:</b>	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

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

**DATA MINING**

**SUBJECT CODE: U2CSE56**

In this course, the students will

<b>CO1:</b>	Understand the essentials of database and knowledge base.
<b>CO2:</b>	Analyze the architecture of data mining and its components educated.
<b>CO3:</b>	Inculcate the effective ways of data pre-processing educated to students.
<b>CO4:</b>	Make the students know the importance association mining educated to students.
<b>CO5:</b>	Learn the essentials of classification mining
<b>CO6:</b>	Impart the knowledge on cluster mining and different clustering techniques.
<b>CO7:</b>	Elaborate text mining, spatial mining, web mining etc.

**COMPUTER FUNDAMENTALS**

**SUBJECT CODE: U2CSN51**

In this course, the students will

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



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<b>CO6:</b>	Elaborate the students on the tools and different utility software in computers.
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### SOFTWARE ENGINEERING

**SUBJECT CODE: U2CSC61**

In this course, the students will

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

### COMPUTER GRAPHICS

**SUBJECT CODE: U2CSC62**

In this course, the students will

<b>CO1:</b>	Understand the basics of computer graphics, graphics systems and applications of computer graphics.
<b>CO2:</b>	Know about geometric transformations on graphics objects and their application in composite form and animation of objects.
<b>CO3:</b>	Learn the basic principles and implementation logic of graphics primitives.
<b>CO4:</b>	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
<b>CO5:</b>	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

<b>CO1:</b>	Provide a detailed coverage of mobile computing and communication aspects
<b>CO2:</b>	Learn how to treat Mobile transport and network protocols
<b>CO3:</b>	Give an exhaustive coverage to MANET and WSN



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<b>CO4:</b>	Deal with mobile application development as well as types of mobile OS
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**SOFTWARE DEVELOPMENT**

**SUBJECT CODE: U2CSC6PR**

In this course, the students will

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

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

**ANDROID PROGRAMMING**

**SUBJECT CODE: U2CSS61**

In this course, the students will

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



**SYSTEM SOFTWARE**

**SUBJECT CODE: U1CSS62**

In this course, the students will

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

**INTRODUCTION TO HTML**

**SUBJECT CODE: U2CSN61**

In this course, the students will

<b>CO1:</b>	Understand the fundamental technology used to define the structure of a webpage.
<b>CO2:</b>	Appreciate the client side and server side web programming.
<b>CO3:</b>	Design an own simple homepage using HTML Tags.
<b>CO4:</b>	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

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

**M.PHIL PROGRAM OUTCOMES**

**RESEARCH METHODOLOGY**

**SUBJECT CODE: M1CSC11**

In this course, the students will

<b>CO1:</b>	Know the research objectives and various research approaches.
<b>CO2:</b>	Impart the knowledge of the research designs and its importance.



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<b>CO3:</b>	Make the scholars Understand the importance of sampling.
<b>CO4:</b>	Know how to prepare Report writing.
<b>CO5:</b>	Use Latex software to prepare research report.
<b>CO6:</b>	Handle Matlab and to write M-File scripts.

### **ARTIFICIAL NEURAL NETWORKS**

**SUBJECT CODE: M3CSE11**

In this course, the students will

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

### **DATA MINING**

**SUBJECT CODE: M1CSC12**

In this course, the students will

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