Department of Computer Science
(BSc. CS)
Programme Outcomes

Upon completion of the Degree Programme the graduate will be able to do -

PO1: At the first year of under-graduation, the basic foundations of two important skills required for software development are laid. A course in problem solving and programming along with a course in database fundamentals forms the preliminary skill set for solving computational problems. The practical courses are designed to supplement the theoretical training in the year. Along with Computer Science, the two theoretical and one practical course each in Statistics, Mathematics and Electronics help in building a strong foundation. Career Advancement courses are introduced in both semesters to cover additional areas of Computer Science.

PO2: At the second year of under-graduation, computational problem-solving skills are further strengthened by a course in Data structures. Software engineering concepts that are required for project design are also introduced. Essential concepts of computer networking are also introduced in this year. The practical course included in both semesters complements the theory courses.

PO3: At the third year of under-graduation, all the subjects are designed to fulfill core Computer Science requirements as well as meet the needs of the software industry. Theory courses are adequately supplemented by hands-on practical courses. Skill Enhancement courses enable the students to acquire additional value-added skills.

Department of Computer Science
(BSc. CS)
Programme Specific Outcomes

Computer Science Students - Upon completion of the Degree Programme the graduate will be able to do -

The objective of the program is to prepare students to undertake careers involving problem solving using computer science and technologies, or to pursue advanced studies and research in computer science. The syllabus which comprises of Computer Science subject along with that of the three allied subjects (Mathematics, Electronics and Statistics) covers the foundational aspects of computing sciences and also develops the requisite professional skills and problem-solving abilities using computing sciences.

Department of Computer Science
(BSc. CS)
Course Outcomes

First Year		
SEMESTER - I		
Course Name	**Code**	**Course Outcomes**
Matrix Algebra	**MTC 111**	➢ A students should be able to work with graphs and identify certain parameters and properties of the given graphs. ➢ A students should be able to perform certain algorithms, justify why these algorithms work, and give some estimates of the running times of these algorithms.
Discrete Mathematics	**MTC 112**	➢ A students should be able to solve basic exercises of the type: given a graph with properties *X*, prove that the graph also has property *Y*. ➢ A students should develop an appreciation for the literature on the subject and be able to read and present results from the literature.
Semiconductor Devices and Basic Electronic Systems	**ELC 111**	➢ Familiarize with current and recent technological developments ➢ Explore various types of semiconductor devices ➢ Study elementary electronic circuits and systems
Principles of Digital Electronics	**ELC 112**	➢ Get familiar with concepts of digital electronics ➢ Learn number systems and their representation. ➢ Understand basic logic gates, Boolean algebra and K-maps. ➢ To study arithmetic circuits, combinational circuits and sequential circuits.
Problem Solving using Computer and 'C' Programming	**CS 111**	➢ Explore algorithmic approaches to problem solving. ➢ Develop modular programs using control structures and arrays in 'C'. ➢ Devise pseudo codes and flowchart for computational problems. ➢ Write, debug and execute simple programs in 'C'.
Database Management Systems	**CS 112**	➢ Create database tables in postgre SQL. ➢ Write and execute simple, nested queries. ➢ Solve real world problems using appropriate set, function, and relational models. ➢ Use SQL.
Descriptive Statistics I	**CSST 111**	➢ At the end of the course, a student should be well equipped to learn and apply acquired techniques in computer-based applications
Mathematical Statistics	**CSST 112**	➢ covers basic concepts and terminology in Statistics and covers basic tools and methods required for data analysis

SEMESTER – II

Course Name	Code	Course Outcomes
Linear Algebra	**MTC 121**	➢ A students should be able to write cohesive and comprehensive solutions to exercises and be able to defend their arguments.
Graph Theory	**MTC 122**	➢ A students should be able to solve basic exercises of the type: given a graph with properties *X*, prove that the graph also has property *Y*.
Instrumentation System	**ELC 121**	➢ To study Instrumentation System. ➢ To study various Sensors, Transducer and Actuators ➢ To study Smart Instrumentation System. ➢ Detail Study of OPAMP For signal Conditioner.
Basics of Computer Organization	**ELC 122**	➢ To get familiar digital sequential circuits. ➢ To study Basic computer Organization. ➢ To study Memory architecture.
Advanced 'C' Programming	**CS 121**	➢ Develop modular programs using control structures, pointers, arrays, strings and structures ➢ Design and develop solutions to real world problems using C.
Relational Database Management Systems	**CS 122**	➢ Design E-R Model for given requirements and convert the same into database tables. ➢ Use database techniques such as SQL & PL/SQL. ➢ Explain transaction Management in relational database System. ➢ Use advanced database Programming concepts.
Methods of Applied Statistics	**CS 111**	➢ To understand the relationship between two variables using scatter plot. ➢ To compute coefficient of correlation, coefficient of regression. ➢ To fit various regression models and to find best fit.
Continuous Probability Distributions and Testing of Hypothesis	**CSST 112**	➢ To fit the Normal distribution. ➢ To understand the trend in time series and how to remove it. ➢ To apply inferential methods for real data sets. ➢ To generate model sample from given distributions. ➢ To understand the importance and functions of different statistical organizations in the development of nation.

Second Year

SEMESTER – III		
Course Name	**Code**	**Course Outcomes**
Software Engineering	**CS 232**	➢ Compare and chose a process model for a software project development. ➢ Identify requirements analyze and prepare models. ➢ Prepare the SRS, Design document, Project plan of a given software system.
Micro controller Architecture & Programming	**ELC 231**	➢ To write programs for 8051 microcontroller. ➢ To interface I/O peripherals to 8051 microcontroller ➢ To design small microcontroller-based projects
Digital Communication and Networking,	**ELC 232**	➢ Define and explain terminologies of data communication ➢ Understand the impact and limitations of various digital modulation techniques ➢ To acknowledge the need of spread spectrum schemes. ➢ Identify functions of data link layer and network layer while accessing communication link ➢ To choose appropriate and advanced techniques to build the computer network
Groups and Coding Theory	**MTC 231**	➢ Reflecting the broad nature of the subject and developing mathematical tools for continuing further study in various fields of science.
Numerical Techniques	**MTC 232**	➢ Give the students a sufficient knowledge of fundamental principles, methods and a clear perception of innumerous power of mathematical ideas and tools and know how to use them by modeling, solving and interpreting.

SEMESTER – IV

Course Name	**Code**	**Course Outcomes**
Structures and Algorithms – II	**CS 241**	➢ Implementation of different data structures efficiently ➢ Usage of well-organized data structures to handle large amount of data ➢ Usage of appropriate data structures for problem solving
Computer Network	**CS 242**	➢ Have a good understanding of the OSI and TCP/IP Reference Models and in particular have a good knowledge of Layers. ➢ Understand the working of various protocols. ➢ Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies
Embedded System Design	**ELC 241**	➢ To understand the concept of Embedded Systems. ➢ To study the design flow and available tools for an Embedded system. ➢ To understand the implementation of Embedded System using firmware and hardware components. ➢ To acquire programming skills for the development of Embedded system design.

		➢ To develop practical skills for designing Embedded System Applications.
Wireless Communication and Internet of Things	**ELC 242**	➢ Know working principal of wireless technologies such as Mobile communication, GSM, GPRS ➢ Become familiar with 3G and 4G Cellular Network Technologies for Data Connections. ➢ Understand working principles of short-range communication application ➢ Get introduce to upcoming technology of Internet of Things ➢ Explore themselves and develop new IoT based applications
Computational Geometry	**MTC 241**	➢ Enabling students to develop a positive attitude towards mathematics as an interesting and valuable subject of study.
Operations Research	**MTC 242**	➢ Enhancing students' overall development and to equip them with mathematical modeling abilities, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

Third Year		
SEMESTER – V		
Course Name	**Code**	**Course Outcomes**
Operating Systems – I	**CS 351**	➢ Processes and Thread Scheduling by operating system ➢ Synchronization in process and threads by operating system ➢ Memory management by operating system using with the help of various schemes
Computer Networks – II	**CS 352**	➢ Student will understand the different protocols of Application layer. ➢ Develop understanding of technical aspect of Multimedia Systems ➢ Develop various Multimedia Systems applicable in real time. ➢ Identify information security goals. ➢ Understand, compare and apply cryptographic techniques for data security.
Web Technologies – I	**CS 353**	➢ Understand how to develop dynamic and interactive Web Page
Foundations of Data Science	**CS 354**	➢ Perform Exploratory Data Analysis ➢ Obtain, clean/process, and transform data. ➢ Detect and diagnose common data issues, such as missing values, special values, outliers, inconsistencies, and localization. ➢ Demonstrate proficiency with statistical analysis of data. ➢ Present results using data visualization techniques. ➢ Prepare data for use with a variety of statistical methods and models and recognize how the quality of the data and the means of data collection may affect conclusions.
Object Oriented Programming using Java – I	**CS 355**	➢ Understand the concept of classes, object, packages and Collections. ➢ To develop GUI based application
Theoretical Computer Science	**CS 356**	➢ Understand the use of automata during language design. ➢ Relate various automata and Languages
Practical Course based on 351	**CS357**	➢ Process synchronization ➢ Processes and Thread Scheduling by operating system ➢ Memory management by operating system using with the help of various schemes
Practical Course based on CS - 353 and CS - 354	**CS 358**	➢ Understand how to develop dynamic and interactive Web Page ➢ Prepare data for use with a variety of statistical methods and recognize how the quality of the data may affect conclusions. ➢ Perform exploratory data analysis
Practical Course based on CS - 355	**CS 359**	➢ Use an integrated development environment to write, compile, run, and test simple object-oriented Java programs. ➢ Read and make elementary modifications to Java programs that solve real-world problems. ➢ Validate input in a Java program.
Python Programming	**CS 3510**	➢ Develop logic for problem solving

		➢ Determine the methods to create and develop Python programs by utilizing the data ➢ Structures like lists, dictionaries, tuples and sets. ➢ To be familiar about the basic constructs of programming such as data, operations, conditions, loops, functions etc. ➢ To write python programs and develop a small application project
Blockchain Technology	**CS 3511**	➢ Learn the fundamentals of Blockchain Technology. ➢ Learn Blockchain programming ➢ Basic knowledge of Smart Contracts and how they function.

SEMESTER – VI

Course Name	Code	Course Outcomes
Operating Systems-II	**CS 361**	➢ Management of deadlocks and File System by operating system ➢ Scheduling storage or disk for processes ➢ Distributed Operating System and its architecture and the extended features in mobile OS.
Software Testing	**CS 362**	➢ To understand various software testing methods and strategies. ➢ To understand a variety of software metrics, and identify defects and managing those defects for improvement in quality for given software. ➢ To design test cases and test plans, review reports of testing for qualitative software. ➢ To understand latest testing methods used in the software industries.
Web Technologies – II	**CS 363**	➢ Build dynamic website. ➢ Using MVC based framework easy to design and handling the errors in dynamic website.
Data Analytics	**CS364**	➢ Use appropriate models of analysis, assess the quality of input, and derive insight from results. ➢ Analyze data, choose relevant models and algorithms for respective applications ➢ Understand different data mining techniques like classification, prediction, clustering and association rule mining ➢ Apply modeling and data analysis techniques to the solution of real-world business problems
Object Oriented Programming using Java – II	**CS 365**	➢ To access open database through Java programs using Java Data Base Connectivity (JDBC) and develop the application. ➢ Understand and Create dynamic web pages, using Servlets and JSP. ➢ Work with basics of framework to develop secure web applications
Compiler Construction	**CS 366**	➢ Understand the process of scanning and parsing of source code. ➢ Learn the conversion code written in source language to machine language. ➢ Understand tools like LEX and YACC.
Practical Course based on CS - 361	**CS 367**	➢ Management of deadlocks by operating system ➢ File System management

		➢ Disk space management and scheduling for processes
Practical Course based on CS - 363 and CS – 364	**CS 368**	➢ Build dynamic website. ➢ Using MVC based framework easy to design and handling the errors in dynamic website.
Practical Course based on CS - 365	**CS 369**	➢ To Learn database Programming using Java ➢ Understand and create dynamic web pages using Servlets and JSP. ➢ Work with basics of framework to develop secure web applications
Software Testing Tools	**CS 3610**	➢ To understand various software testing methods and strategies. ➢ To understand a variety of software metrics and identify defects and managing those defects for improvement in quality for given software. ➢ To design test cases and test plans, review reports of testing for qualitative software. ➢ To understand latest testing tools used in the software industries