Course Learning Outcome

UG Calendar

SESSION 2024-25

BACHELOR OF COMPUTER APPLICAITON

Department of Mathematics & Computer

C Programming

Basic Structure of C Program

|			
Document section 01	Main function 03	Global declaration section 05	Main function declaration section 07
Definition section 02	Preprocessor/link section 04	User-defined function section 06	
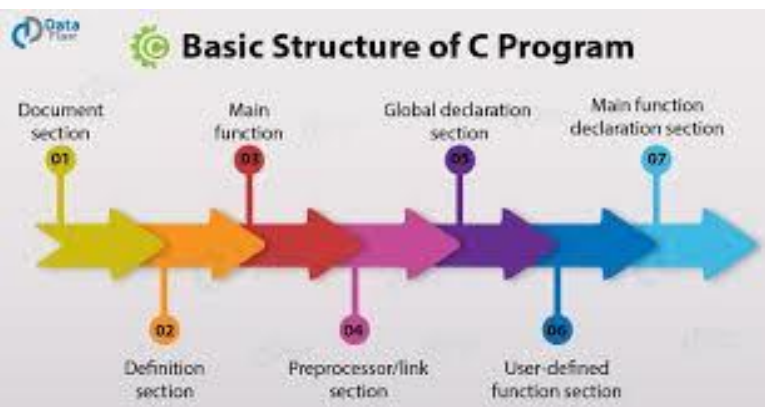
✏️ **Course Learning Outcomes** 📕

B.sc I Year
Computer Application

Course Code – S1-COAP1T (Major)

Course Title	**Programming in C language**

CO1:	**Understanding of C Programming Basics**	• Understand the basic structure of a C program, including the concepts of functions, loops, conditionals, variables, and data types. • Gain familiarity with syntax, compilation, and execution of C programs.
	Problem Solving Using C	• Develop the ability to break down complex problems into smaller, solvable parts. • Write efficient algorithms and implement them in C to solve real-world problems.
CO2:	**Mastery of Control Structures**	• Use control structures such as if-else, switch-case, for, while, and do-while loops to control the flow of execution in a program.
CO3:	**Array and String Manipulation**	• Understand how to use arrays for storing data and strings for handling text. • Perform various operations like sorting, searching, and manipulating strings and arrays.
CO4:	**Functions and Recursion**	• Implement modular programs using functions for code reuse. • Understand and implement recursion to solve problems that can be divided into smaller sub problems.
	Pointers and Memory Management	• Understand pointers, memory addresses, and dynamic memory allocation. • Use pointers for efficient memory management and creating complex data structures like linked lists.
CO5:	**File Handling**	• Learn file operations in C, including reading from and writing to files. • Implement programs that store and retrieve data using files.
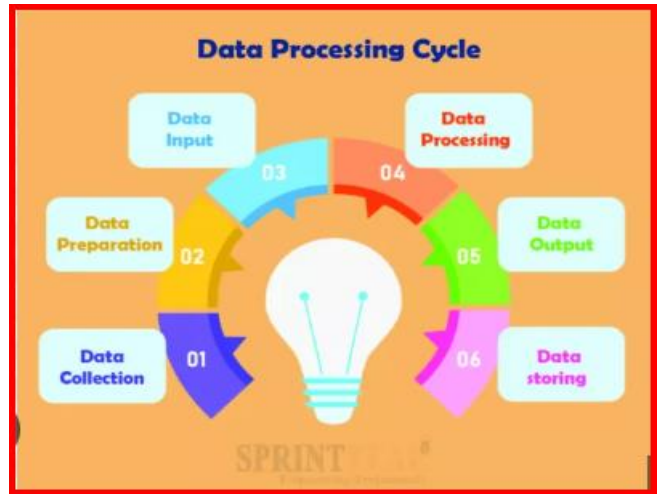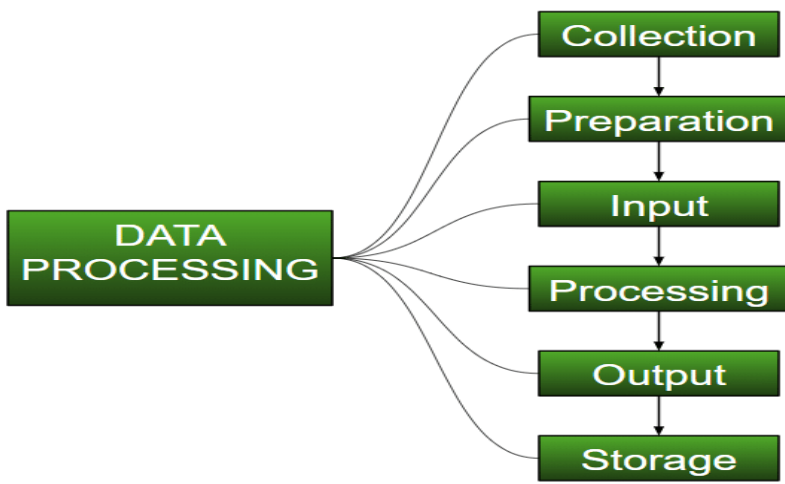
✎ <u>**Course Learning Outcomes**</u> 📑

B.sc I Year
Computer Application
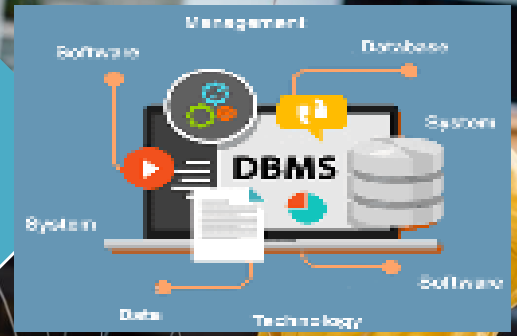
Course Code – S1-COAP2T

Course Title		Data Processing Software (Major/minor/elective)
CO1:	**Proficiency in MS Office Applications:**	• Students will gain proficiency in using key MS Office applications such as Word, Excel, PowerPoint, and Outlook to perform various tasks.
CO2:	**Document Creation and Formatting:**	• Students will learn how to create, format, and customize professional documents using MS Word, including text formatting, inserting graphics, and using tables, styles, and templates.
CO3:	**Data Management and Analysis:**	• Students will be able to use MS Excel to organize, analyze, and present data through spreadsheets, utilizing functions, formulas, charts, and pivot tables.
CO4:	**Presentation Design and Delivery:**	• Students will develop skills in creating visually appealing and effective presentations using MS PowerPoint, including the use of slides, animations, multimedia, and transitions.
CO5:	**Collaboration and Document Sharing:**	• Students will understand how to collaborate and share documents effectively, using features such as file sharing, comments, and version tracking in MS Office applications.

DATA BASE MANAGEMENT SYSTEM

✏ Course Learning Outcomes 📖

B.sc II Year
Computer Application

Course Code – S2-COAP1T (Major)

Course Title:	DATA BASE MANAGEMENT SYSTEM (Major)	
CO1	**Understand the Basics of Databases and DBMS Concepts**	• Gain knowledge of fundamental database concepts such as data models, database architectures, and the role of a DBMS. • Understand the differences between various types of databases (relational, NoSQL, object-oriented, etc.).
	Design Databases Using ER Modeling	• Learn how to design databases using Entity-Relationship (ER) diagrams, including identifying entities, attributes, and relationships. • Convert ER diagrams into relational schemas AND Relational Algebra.
CO2	**Master SQL for Data Definition, Data Manipulation, and Data Control**	• Be proficient in using Structured Query Language (SQL) to create, update, delete, and query data in relational databases. • Understand advanced SQL queries like joins, subqueries, and aggregate functions. • Learn about data integrity, constraints, and normalization to design efficient and scalable databases.
CO3	**Normalization and Database Schema Optimization**	• Learn the process of normalization and how to apply normalization rules to eliminate data redundancy and improve database efficiency. • Understand various normal forms (1NF, 2NF, 3NF, BCNF) and their application in database design.
CO4	**Understand Database Transaction Management**	• Understand the concepts of transactions, ACID properties (Atomicity, Consistency, Isolation, Durability), and how they ensure database reliability. • Learn transaction control commands like COMMIT, ROLLBACK, and SAVEPOINT.
CO5	**Database Security and Integrity**	• Learn about database security features such as user authentication, access control, and encryption. • Understand how to ensure data integrity through constraints, triggers, and referential integrity. • For implementation of different security features to secure the database.

✏️ Course Learning Outcomes 📖

B.sc II Year
Computer Application

Course Code – S2-COAP2T (Major)

Course Title:	Introduction to ASP.NET & C# (Major/minor/elective)

CO1:	**Understand the ASP.NET Framework**	• Demonstrate a fundamental understanding of the ASP.NET framework, including its architecture, components, and lifecycle. • object-oriented programming (OOP) principles, and how they apply to web development.
	Understand the Basics of C# Programming:	• Demonstrate a strong understanding of fundamental C# concepts, including variables, data types, operators, control structures (if, loops), and methods. • Create simple applications using C# to implement logic and functionality.
CO2:	**Developing Console and Desktop Applications with C#**	• Develop simple console applications in C# to practice logic and programming concepts. • Learn about Windows Forms or WPF (Windows Presentation Foundation) for developing desktop applications.
CO3:	**Creating Web Applications with ASP.NET Core**	• Gain an understanding of the ASP.NET Core framework for building web applications. • Learn how to build web pages using ASP.NET Core MVC (Model-View-Controller) architecture. • Understand the routing system in ASP.NET Core for handling HTTP requests.
CO4:	**Data Access using Entity Framework**	• Learn how to interact with databases using Entity Framework (EF) to perform CRUD (Create, Read, Update, Delete) operations. • Use LINQ to query data from databases and understand the concept of migrations for database schema changes.
CO5:	**Implementing Web API Development with ASP.NET**	• Understand the principles of API design. • Learn how to develop Web APIs using ASP.NET Core for providing backend services.

✏ <u>Course Learning Outcomes</u> 📖

B.sc III Year
Computer Application

Course Code – S3-COAP1T (Major)

Course Title:	Programming in java	
CO1:	**Understand Java Fundamentals:**	• Gain a solid foundation in Java programming language syntax, basic structures, and key concepts such as variables, data types, and control flow (loops, conditionals). • Understand how to work with primitive types, objects, and classes. • To Identify Java code utilities in applets, Java packages, and classes, Applets
	Object-Oriented Programming (OOP) Principles:	• Develop proficiency in object-oriented programming principles such as encapsulation, inheritance, polymorphism, and abstraction. • Design and implement classes and objects with proper use of constructors, methods, and access modifiers.
CO2:	**Master Java Collections Framework:**	• Understand and implement common data structures (lists, sets, maps) using Java's Collections Framework. • Apply various collection classes to solve real-world programming problems efficiently.
CO3:	**Exception Handling:**	• Learn how to handle errors and exceptions using Java's exception-handling mechanisms. • Understand the importance of writing robust programs using `try, catch, finally,` and custom exception classes.
CO4:	**File I/O and Data Handling:**	• Work with Java's Input/output streams to read and write files. • Understand the basics of serializing and desterilizing data in Java.
CO5:	**Debugging and Testing:**	• Develop skills in debugging Java applications using IDEs and other debugging tools. • Learn about unit testing frameworks like JUnit and write test cases for Java applications.

Multimedia Tools and Applications

✏ Course Learning Outcomes 📕

B.sc III Year
Computer Application

Course Code – S3-COAP2T (Major)

| Course Title:	Multimedia Tools and Applications	
CO1:	**Understand Multimedia Fundamentals:**	• Define multimedia and explain the components of multimedia systems (text, audio, video, graphics, animation, and interactivity). • Describe the basic principles of multimedia design and development.
		• To work with all aspects of text, audio, images and video.
CO2:	**Proficiency in Multimedia Software and Tools:**	• To understand the principles of multimedia authoring paradigm and tools. • Develop proficiency in using multimedia creation and editing tools like Adobe Photoshop, Adobe Premiere, Final Cut Pro, and other multimedia production software for designing graphics, video editing, animation, and sound processing.
CO3:	**Designing and Creating Multimedia Content:**	• Learn to design and develop multimedia content that integrates multiple forms of media, ensuring the seamless presentation of content for web, mobile, and other digital platforms.
CO4:	**Audio and Video Production:**	• Acquire skills in audio and video production, including capturing, editing, and enhancing media for various applications such as podcasts, films, online tutorials, and digital marketing.
CO5:	**Understanding File Formats and Compression Techniques:**	• To apply different compression principles, compression techniques and compression standards. • Learn about different multimedia file formats, their characteristics, and the techniques for compressing and optimizing media content for efficient storage and transmission.

✏️ Course Learning Outcomes 📕

B.sc III Year
Computer Application

Course Code – S3-COAP2T (Minor/elective)

Course Title:	Internet and its Applications

CO1:	**Understand the Fundamentals of the Internet**	• Define what the internet is and describe its components. • Explain how the internet works, including concepts such as protocols (HTTP, FTP, etc.), IP addressing, DNS, and routing. • Understand basic networking principles, including client-server models, bandwidth, and data transmission.
CO2:	**Understand Web Technologies**	• Gain proficiency in the use of web browsers, search engines, and web-based tools. • Learn about web development technologies (HTML, CSS, JavaScript) and how they are used to create and display websites. • Understand the importance of web security protocols, including SSL/TLS and HTTPS.
CO3:	**Understand Internet Protocols and Services**	• Learn about and configure different internet protocols (TCP/IP, UDP, etc.) and their role in network communication. • Study internet services such as web hosting, domain name registration, and file transfer protocols (FTP).
CO4:	**Understand E-Commerce and Online Business Models**	• Learn about the evolution and functioning of e-commerce platforms. • Examine online business models, payment systems, and digital marketing techniques. • Understand the challenges and opportunities for businesses using the internet.
CO5:	**Develop Practical Internet Skills**	• Gain hands-on experience with various internet applications, including web browsing, email management, and social networking. • Learn basic troubleshooting skills for internet connectivity and browser issues. • Explore the development of simple web pages and websites.
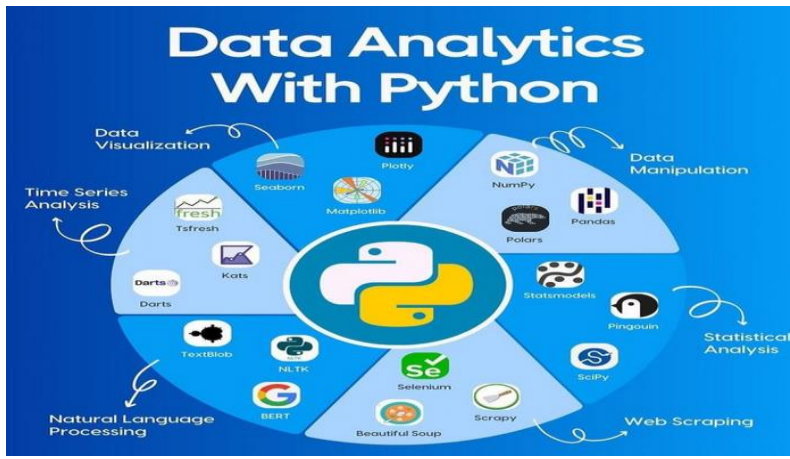
✎ Course Learning Outcomes 📖

B.sc IV Year(Honors)
Computer Application

Course Code – S4-COAP1T (CORE I)

Course Title:	**Data Analytics With Python**	
CO1:	**Understand the Fundamentals of Data Analytics**	• Gain an understanding of the data analysis process, including data collection, data cleaning, exploration, analysis, and visualization. • Recognize the types of data and how to handle different data formats such as CSV, JSON, and databases.
CO2:	**Proficiency in Python Programming for Data Analytics**	• Learn how to use Python libraries like **NumPy**, **Pandas**, **Matplotlib**, **Seaborn**, and **SciPy** to handle and analyse data. • Be able to work with Python for various data manipulation tasks, such as merging datasets, filtering, aggregation, and applying mathematical functions.
CO3:	**Data Cleaning and Preprocessing:**	• Master techniques for handling missing data, removing duplicates, handling outliers, and standardizing data. • Learn how to format and transform data to make it suitable for analysis.
CO4:	**Data Visualization:**	• Develop skills to create meaningful visualizations of data using Python libraries such as **Matplotlib**, **Seaborn**, and **Plotly**. • Understand how to create charts, graphs, and plots (histograms, scatter plots, bar charts, heat maps) to communicate data insights effectively.
CO5:	**Statistical Analysis and Probability:**	• Understand basic statistical concepts (mean, median, mode, variance, etc.) and apply them to datasets. • Learn how to apply probability theory to real-world problems using Python.

✎ Course Learning Outcomes 📕

B.sc IV Year(Honors)
Computer Application

Course Code – S4-COAP2T (CORE II)

Course Title:		Software Engineering and project Management
CO1:	**Understanding Software Engineering Principles:**	• Gain a strong understanding of software development life cycles, methodologies, and best practices. • Learn about the stages of software development, from requirements gathering to maintenance.
CO2:	**Requirement Analysis and Specification:**	• Develop skills to elicit, analyse, and document software requirements for systems. • Learn to write clear and detailed software requirement specifications.
CO3:	**Design and Architecture:**	• Understand software design principles, patterns, and how to create scalable and maintainable software architectures. • Apply techniques like object-oriented design, data modelling, and UML for system modelling.
CO4:	**Software Testing and Quality Assurance:**	• Learn different testing techniques (unit, integration, system, acceptance testing) and how to ensure software quality. • Understand how to implement and automate testing processes to detect defects early.
CO5:	**Software Project Management:**	• Learn how to plan, execute, monitor, and control software projects using software engineering practices. • Develop an understanding of resource allocation, scheduling, risk management, and cost estimation.

✎ Course Learning Outcomes 📖

B.sc IV Year(Honors)
Computer Application

Course Code – S4-COAP1D (DSE I)

Course Title:	Design And Analysis of Algorithms	
CO1:	**Understanding Software Engineering Principles:**	• Gain a strong understanding of software development life cycles, methodologies, and best practices. • Learn about the stages of software development, from requirements gathering to maintenance.
CO2:	**Requirement Analysis and Specification:**	• Develop skills to elicit, analyse, and document software requirements for systems. • Learn to write clear and detailed software requirement specifications.
CO3:	**Design and Architecture:**	• Understand software design principles, patterns, and how to create scalable and maintainable software architectures. • Apply techniques like object-oriented design, data modelling, and UML for system modelling.
CO4:	**Software Testing and Quality Assurance:**	• Learn different testing techniques (unit, integration, system, acceptance testing) and how to ensure software quality. • Understand how to implement and automate testing processes to detect defects early.
CO5:	**Software Project Management:**	• Learn how to plan, execute, monitor, and control software projects using software engineering practices. • Develop an understanding of resource allocation, scheduling, risk management, and cost estimation.

✏️ Course Learning Outcomes 📖

B.sc IV Year(Honors)
Computer Application

Course Code – S4-COAP2D (DSE II)

Course Title:	Computer Graphics & Multimedia	
CO1:	**Understanding of Computer Graphics Principles:**	• Understand the basic concepts of computer graphics, such as raster graphics, vector graphics, and their applications. • Demonstrate knowledge of geometric transformations (translation, scaling, rotation, reflection) in 2D and 3D spaces. • Apply algorithms for drawing basic shapes and objects (e.g., lines, circles, polygons) on a computer screen. • Understand the fundamentals of rendering, shading, lighting, and texture mapping in computer graphics.
CO2:	**Proficiency in 2D and 3D Transformations:**	• Understand and apply transformations like translation, scaling, rotation, and shearing in both 2D and 3D spaces. • Perform transformations on graphical objects and work with homogeneous coordinates.
CO3:	**Mastery of Algorithms for Drawing and Rendering:**	• Implement algorithms for basic geometric shapes like lines (Bresenham's line algorithm), circles, and polygons. • Learn and apply various algorithms for hidden surface removal (e.g., Z-buffer, depth sorting), shading, and rendering.
CO4:	**Knowledge of Color Models:**	• Understand and apply various color models such as RGB, CMYK, and HSL, and their applications in computer graphics. • Learn how to work with color spaces and their representation in digital images.
CO5:	**Understanding Multimedia File Formats:**	• Develop a deep understanding of different multimedia file formats (audio, video, image, and text). • Identify and differentiate between commonly used file formats (e.g., MP3, WAV, JPEG, PNG, MP4, AVI).

✎ Course Learning Outcomes 📖

B.sc IV Year(Honors)
Computer Application

Course Code – X4-AREM1T

Course Title:	RESERCH METHODOLOGY
CO1:	**Understanding of Research Process:** • Develop an understanding of the basic principles of research methodology, including different types of research (qualitative, quantitative, and mixed methods). • Understand the research process from problem identification to data collection, analysis, and reporting.
CO2:	**Research Design and Planning** • Choose an appropriate research design (e.g., experimental, descriptive, case study, survey) based on the nature of the research question. • Develop a research plan, including the selection of data collection methods, sampling techniques, and ethical considerations.
CO3:	**Data Analysis and Interpretation** • Analyse and interpret qualitative and quantitative data using statistical tools or qualitative analysis software. • Use appropriate techniques to present research findings, including tables, graphs, and statistical summaries.
CO4:	**Writing Research Proposals and Reports** • Develop the skills to write clear and concise research proposals and research reports. • Communicate research findings effectively through well-structured research papers, presentations, or reports.
CO5:	**Practical Application of Testing Methods:** • Apply research testing methods in real-world scenarios, demonstrating the ability to solve practical problems using scientific research techniques.