

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS**  
**B.Sc. (COMPUTER SCIENCE), B. Com (COMPUTER APPLICATION)**

**PROGRAMME OUTCOMES**

**At the end of the program students will have:**

**PO1: Essential Knowledge:**

Comprehensive discipline knowledge and understanding of computer functionality various uses of applications, computer science involved in basic application working to creation and to apply their knowledge in practice.

**PO2: Creative and critical thinking and problem-solving abilities:**

Be effective problem solvers, able to apply critical and evidence-based thinking and to put in front the programming challenges in computer science and to conceive innovative responses to future challenges.

**PO3: Teamwork and communication skills:**

Be able to convey ideas and information effectively to a range of audiences for a variety of purposes and contribute in a positive and collaborative manner to achieving goals.

**PO4: Professionalism and leadership readiness:**

Be able to engage in professional behavior and have the potential to take leadership roles in their chosen occupations and communities.

**PO5: Intercultural and ethical competency:**

Be responsible and effective global citizens whose personal values and practices are consistent with their roles as responsible members of society.

**PO6: Social responsibility:**

Be sensitive to and demonstrate experimental evidence which does not affect the society.

**SPECIFIC PROGRAM OUTCOMES FOR  
B.Sc (COMPUTER SCIENCE), B. Com (COMPUTER APPLICATION)**

- SPO1:** A student should be able to recall basics concepts in computer and should be able to work or operate.
- SPO2:** A student should get adequate exposure to global and local concerns that explore them many aspects of computer science & applications.
- SPO3:** Student is equipped with creative talent and power of communication necessary for various kinds of employment.
- SPO4:** Student should be able to apply their skills and knowledge in practical's.
- SPO5:** Enabling students to develop a positive attitude towards programming languages as an interesting & valuable subject of study.
- SPO6:** Think in a critical manner.
- SPO7:** Acquire good knowledge and understanding in advanced areas of computer science & applications chosen by the student from the given courses.
- SPO8:** The skills and knowledge gained has intrinsic beauty, which also leads to proficiency. This can be utilized in modelling and solving real life problems.
- SPO9:** To recognize patterns and to distinguish between essential and irrelevant aspects of problems.
- SPO10:** Ability to share ideas and insights while seeking and benefitting from knowledge and insight of others. This helps them to learn behave responsibly in a rapidly changing interdependent society.
- SPO11:** This Program will also help students to enhance their employability for jobs in research institutes,IT origination and teaching fields, scientific data analyst and in various other public and private companies.

**DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS (2016-19)**  
**COURSE OUTCOMES**

**SEM-I PROGRAMMING IN C (2016-17)**

After the completion of the course, Students will be able to

- CO1: Understanding a functional hierarchical code organization.
- CO2: Ability to define and manage data structures based on problem subject domain.
- CO3: Ability to work with textual information, characters, and strings.
- CO4: Ability to work with arrays of complex objects.
- CO5: Understanding a concept of object thinking within the framework of functional model.
- CO6: Understanding a concept of functional hierarchical code organization.
- CO7: Understanding a defensive programming concept. Ability to handle possible errors during program execution.

**SEM-II PROGRAMMING IN C++ (2016-17)**

After the completion of the course, Students will be able to

- CO1: an ability to incorporate exception handling in object-oriented programs.
- CO2: an ability to use template classes and the STL library in C++.
- CO3: an understanding of the concepts of OOPs including inheritance and polymorphism.
- CO4: an ability to overload operators in C++.
- CO5: an understanding of the difference between function overloading and function overriding.

**SEM-II FUNDAMENTAL OF COMPUTERS (2016-17)**

After the completion of the course, Students will be able to

- CO1: Understanding the concept of input and output devices of Computers.
- CO2: Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.
- CO3: Understand an operating system and its working, and solve common problems related to operating systems.
- CO4: Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.
- CO5: Study to use the Internet safely, legally, and responsibly.

**SEM-III DATA STRUCTURE (2017 – 18)**

After the completion of the course, Students will be able to

- CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.
- CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.
- CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.
- CO4: Demonstrate different methods for traversing trees.
- CO5: Illustrate various technique to for searching, sorting and hashing.
- CO6: Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.
- CO7: Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.
- CO8: Summarize different categories of data Structures.

### **SEM-III SciLab (SEC-1) (2017 – 18)**

After the completion of the course, Students will be able to

CO1: Scilab environment and programming language.

CO2: Use decision making control statements like if, if else and loops (for, while) to develop programs.

CO3: Use data structures like list, struct and cell arrays available in scilab to manage and work with data.

CO4: Use 2D, 3D graphical functions to display and analyze data.

CO5: Understand about operations on figures and axes.

### **SEM-IV DATABASE MANAGEMENT SYSTEM (2017 -18)**

After the completion of the course, Students will be able to

CO1: Understand the normalization of databases through various case studies.

CO2: Use of query optimization techniques, backup and recovery features of database management software.

CO3: Create a new database and administer the database management software.

CO4: Develop different web databases and object-oriented database management system.

CO5: Describe the usage of data mining tools.

### **SEM-IV SciLab (SEC-2) (2017 -18)**

After the completion of the course, Students will be able to

CO1: Plot finite element analysis results in 2d or 3d.

CO2: Use scripts and functions to create object oriented modular programs to solve complex engineering problems.

CO3: Use mathematical functions to solve problems on vectors, matrices, polynomials, differential equations, and finite difference method.

CO4: Develop graphical user interface with basic controls like text box, combo box, labels, radio buttons and advanced controls like list table and many more using scilab gui module.

CO5: Use Scilab API interface module to develop and link external C/C++ programs with Scilab.

### **SEM-V PROGRAMMING IN JAVA (2018 -19)**

After the completion of the course, Students will be able to

CO1: To learn Object Oriented Programming language.

CO2: To learn database programming using Java.

CO3: To handle abnormal termination of a program using exception handling.

CO4: To create flat files.

CO5: To study web development concept using Servlet and JSP.

**SEM-V PAPER -V OPERATING SYSTEM (DSE A) (2018 -19)**

After the completion of the course, Students will be able to

CO1: Understand the basics of operating systems like kernel, shell, types and views of operating systems.

CO2: Describe the various CPU scheduling algorithms and remove deadlocks.

CO3: Explain various memory management techniques and concept of thrashing.

CO4: Use disk management and disk scheduling algorithms for better utilization of external memory.

CO5: Recognize file system interface, protection, and security mechanisms.

CO6: Explain the various features of distributed OS like Unix, Linux, windows etc..

**SEM-V PAPER -VI SOFTWARE ENGINEERING (DSE B) (2018 -19)**

After the completion of the course, Students will be able to:

CO1: Plan a software engineering process life cycle, including the specification, design, implementation, and testing of software systems that meet specification, performance, maintenance and quality requirements.

CO2: Able to elicit, analyze and specify software requirements through a productive working relationship with various stakeholders of the project.

CO3: Analyze and translate a specification into a design, and then realize that design practically, using an appropriate software engineering methodology.

CO4: Know how to develop the code from the design and effectively apply relevant standards and perform testing, and quality management and practice.

CO5: Able to use modern engineering tools necessary for software project management, time management and software reuse.

**SEM-V PYTHON– 1 (2018 -19)**

After the completion of the course, Students will be able to

CO1: To understand why Python is a useful scripting language for developers.

CO2: To learn how to use lists, tuples, and dictionaries in Python programs.

CO3: To learn how to identify Python object types.

CO4: To learn how to use indexing and slicing to access data in Python programs.

CO5: To define the structure and components of a Python program.

CO6: To learn how to write loops and decision statements in Python.

CO7: To learn how to write functions and pass arguments in Python.

**SEM-V INFORMATION TECHNOLOGY – (GE-1) (2018 -19)**

After the completion of the course, Students will be able to

CO1: Design and develop software solutions for contemporary business environments by employing appropriate problem-solving strategies.

CO2: Configure and administer database servers to support contemporary business environments.

CO3: Comprehend and resolve common desktop and network issues.

## **SEM-VI COMPUTER NETWORKS (2018 -19)**

After the completion of the course, Students will be able to

CO1: Understand different network technologies and their application.

CO2: Be updated with different advanced network technologies that can be used to connect different networks.

CO3: Be familiar with various hardware and software that can help run a smooth network.

## **SEM -VI PAPER -VIII PHP WITH MySQL (DSE A) (2018 -19)**

After the completion of the course, Students will be able to

CO1: Understand the animal cell lines,genetic manipulations of cells.

CO2: Understand commercial applications of cell culture.

CO3: Know about model organisms and their significance.

CO4: Understand about DNA micromanipulation.

CO5: Understand development in molecular markers.

## **SEM -VI PAPER -VIII WEB TECHNOLOGY (DSE B) (2018 -19)**

After the completion of the course, Students will be able to

CO1: Explain the history of the internet and related internet concepts that are vital in understanding web development.

CO2: Discuss the insights of internet programming and implement complete application over the web.

CO3: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO4: Utilize the concepts of JavaScript and Java

CO5: Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.

## **SEM-VI SEC-4 PYTHON – 2 (2018 -19)**

After the completion of the course, Students will be able to

CO1: To learn how to build and package Python modules for reusability.

CO2: To learn how to read and write files in Python.

CO3: To learn how to design object-oriented programs with Python classes.

CO4: To learn how to use class inheritance in Python for reusability.

CO5: To learn how to use exception handling in Python applications for error handling.

CO6: To acquire programming skills in core Python.

CO7: To acquire Object Oriented Skills in Python

**SEM-VI INFORMATION TECHNOLOGY – (GE-2) (2018 -19)**

After the completion of the course, Students will be able to

CO1: Analyze common business functions and identify, design, and develop appropriate information technology solutions (in web, desktop, network, and/or database applications).

CO2: Learn future technologies through acquired foundational skills and knowledge and employ them in new business environments.

CO3: Practice communication, problem solving and decision-making skills using appropriate technology and with the understanding of the business environment.

## DEPARTMENT OF COMPUTER SCIENCE & APPLICATIONS (2020-23)

| <b>SEM-I PROGRAMMING IN C (2020 – 21)</b>  |
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| After the completion of the course, Students will be able to<br><br>CO1: Understanding a functional hierarchical code organization.<br>CO2: Ability to define and manage data structures based on problem subject domain.<br>CO3: Ability to work with textual information, characters, and strings.<br>CO4: Ability to work with arrays of complex objects.<br>CO5: Understanding a concept of object thinking within the framework of functional model.<br>CO6: Understanding a concept of functional hierarchical code organization.<br>CO7: Understanding a defensive programming concept. Ability to handle possible errors during program execution.   |
| <b>SEM-II PROGRAMMING IN C++ (2020 -21)</b>  |
| After the completion of the course, Students will be able to<br><br>CO1: an ability to incorporate exception handling in object-oriented programs.<br>CO2: an ability to use template classes and the STL library in C++.<br>CO3: an understanding of the concepts of OOPs including inheritance and polymorphism.<br>CO4: an ability to overload operators in C++.<br>CO5: an understanding of the difference between function overloading and function overriding.   |
| <b>SEM-II FUNDAMENTAL OF COMPUTERS (AECC -2) (2020 -21)</b>  |
| After the completion of the course, Students will be able to<br><br>CO1: Understanding the concept of input and output devices of Computers.<br>CO2: Learn the functional units and classify types of computers, how they process information and how individual computers interact with other computing systems and devices.<br>CO3: Understand an operating system and its working, and solve common problems related to operating systems.<br>CO4: Learn basic word processing, Spreadsheet and Presentation Graphics Software skills.<br>CO5: Study to use the Internet safely, legally, and responsibly.  |
| <b>SEM-III DATA STRUCTURE USING C++ (2020 -21)</b>   |
| After the completion of the course, Students will be able to<br><br>CO1: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms.<br>CO2: Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs.<br>CO3: Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs.<br>CO4: Demonstrate different methods for traversing trees.<br>CO5: Illustrate various technique to for searching, Sorting and hashing.<br>CO6: Describe the concept of recursion, give examples of its use, describe how it can be implemented using a stack.<br>CO7: Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.<br>CO8: Summarize different categories of data Structures. |



### **SEM-III PYTHON -1 (SEC - 2) (2020 -21)**

After the completion of the course, Students will be able to

- CO1: To understand why Python is a useful scripting language for developers.
- CO2: To learn how to use lists, tuples, and dictionaries in Python programs.
- CO3: To learn how to identify Python object types.
- CO4: To learn how to use indexing and slicing to access data in Python programs.
- CO5: To define the structure and components of a Python program.
- CO6: To learn how to write loops and decision statements in Python.
- CO7: To learn how to write functions and pass arguments in Python.

### **SEM-IV DATABASE MANAGEMENT SYSTEMS (2020-21)**

After the completion of the course, Students will be able to

- CO1: Understand the normalization of databases through various case studies.
- CO2: Use of query optimization techniques, backup and recovery features of database management software.
- CO3: Create a new database and administer the database management software.
- CO4: Develop different web databases and object-oriented database management system.
- CO5: Describe the usage of data mining tools.

### **SEM-IV PYTHON -2 (SEC - 4) (2020 -21)**

After the completion of the course, Students will be able to

- CO1: To learn how to build and package Python modules for reusability.
- CO2: To learn how to read and write files in Python.
- CO3: To learn how to design object-oriented programs with Python classes.
- CO4: To learn how to use class inheritance in Python for reusability.
- CO5: To learn how to use exception handling in Python applications for error handling.
- CO6: To acquire programming skills in core Python.
- CO7: To acquire Object Oriented Skills in Python

### **SEM-V PROGRAMMING IN JAVA (2022 -23)**

After the completion of the course, Students will be able to

- CO1: To learn Object Oriented Programming language.
- CO2: To learn database programming using Java.
- CO3: To handle abnormal termination of a program using exception handling.
- CO4: To create flat files.
- CO5: To study web development concept using Servlet and JSP.

### **SEM-V INFORMATION TECHNOLOGIES (GE) (2022 -23)**

After the completion of the course, Students will be able to

CO1: Design and develop software solutions for contemporary business environments by employing appropriate problem-solving strategies.

CO2: Configure and administer database servers to support contemporary business environments.

CO3: Comprehend and resolve common desktop and network issues.

CO4: Analyze common business functions and identify, design, and develop appropriate information technology solutions (in web, desktop, network, and/or database applications).

CO5: Learn future technologies through acquired foundational skills and knowledge and employ them in new business environments.

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### **SEM -VI WEB TECHNOLOGIES (2022-23)**

After the completion of the course, Students will be able to:

CO1: Explain the history of the internet and related internet concepts that are vital in understanding web development.

CO2: Discuss the insights of internet programming and implement complete application over the web.

CO3: Demonstrate the important HTML tags for designing static pages and separate design from content using Cascading Style sheet.

CO4: Utilize the concepts of JavaScript and Java

CO5: Use web application development software tools i.e. Ajax, PHP and XML etc. and identify the environments currently available on the market to design web sites.

### **SEM -VI PHP WITH MySQL (DSE A) (2022-23)**

After the completion of the course, Students will be able to

CO1: Learn Core-PHP, Server-Side Scripting Language.

CO2: Learn PHP-Database handling.

CO3: Learn different technologies used at client-Side Scripting Language.

CO4: Learn XML, CSS and XML parsers.

CO5: One PHP framework for effective design of web application.

CO6: Learn JavaScript to program the behavior of web pages.

CO7: Learn AJAX to make our application more dynamic. Design a commercial relational database system (Oracle, MySQL) by writing SQL using the system.

**SEM -VI MAJOR PROJECT (DSE B) (2022-23)**

CO1: Students should be able to design and construct a hardware and software system, component, or process to meet desired needs.

CO2: Students are provided to work on multidisciplinary Problems.

CO3: Students should be able to work as professionals, with portfolio ranging from data management, network configuration, designing hardware, database and software design to management and administration of entire systems.