Program Objectives:

Students who choose B.Sc. (HG / RC) Computer Science Program, will develop the ability to think critically, logically, analytically and to use and apply current technical concepts and practices in the core development of solutions in the form of Information Technology. The knowledge and skills gained with a degree in Computer Science prepare graduates for a broad range of jobs in Education sector, Research field, Government sector, Business sector and Industry. The program covers the various essential concepts in Computer Science.

These are included as core course like Structured Foundation of Computer Fundamentals, Computing Methods, Data Structure, Software Engineering, Programming Concepts in various languages (C, C++, Java, Visual Basic etc.), Design and Analysis of Algorithm, Theory of Computation, System Programming, Computer Networking, System Administration, Operating System, Computer Architecture, Microprocessor, PHP programming, Numerical Methods, Computer Graphics and Database Management System.

An exceptionally broad range of topics covering current trends and technologies in Computer Science like - Programming in Python, Information Security and Cyber Laws, Data Mining, R-Programming, E-commerce, Data Sciences, Internet Technologies, Artificial Intelligence, Android Programming, UNIX/ LINUX programming etc are included in the course. Hands on sessions in Computer Lab using various Programming languages and tools will enable students to deal with real life problems which will lead to better understanding of the topics and will also widen the horizon of students' self-experience.

Program Learning Outcomes:

Completion of B.Sc. (HG/ RC) Computer Science Program shall enable a student

i) To communicate technical information both orally and in writing

ii) Apply the knowledge gained in core courses to a broad range of advanced topics in Computer Science, to learn and develop sophisticated technical products independently.

iii) To design, implement and evaluate computer-based system, process, component,

or program to meet desired needs by critical understanding, analysis and synthesis.

iv) Identify applications of Computer Science in other fields in the real world to

enhance the career prospects

v) Realize the requirement of lifelong learning through continued education and

research.

vi) Use the concepts of best practices and standards to develop user interactive

and abstract application

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vii) Understand the professional, ethical, legal, security, social issues and responsibilities

Problem Solving using Computer (CSC-RC-1016)

Solving problems is the core of computer science. Programmers must first understand how a human solves a problem, then understand how to translate this "algorithm" into something a computer can do, and finally how to "write" the specific syntax (required by a computer) to get the job done. It is sometimes the case that a machine will solve a problem in a completely different way than a human.

Contents: Fundamentals of computer, organization of computer, Introduction to python etc.

Database Management Systems (CSC-RC-2016)

A database management system (DBMS) refers to the technology for creating and managing databases. DBMS is a software tool to organize (create, retrieve, update, and manage) data in a database. The main aim of a DBMS is to supply a way to store up and retrieve database information that is both convenient and efficient. By data, we mean known facts that can be recorded and that have embedded meaning. Usually, people use software such as DBASE IV or V, Microsoft ACCESS, or EXCEL to store data in the form of a database. A datum is a unit of data. Meaningful data combined to form information. Hence, information is interpreted data - data provided with semantics. MS. ACCESS is one of the most common examples of database management software.

Contents: Introduction,Entity Relationship Model,Relational Model,Relational Algebra,Functional Dependencies,Normalisation,Transactions and Concurrency Control,Indexing, B and B+ trees,File Organization,SQL etc.

Operating Systems (CSC-RC-3016)

An Operating System (OS) is a collection of software that manages computer hardware resources and provides common services for computer programs. When you start using a Computer System then it's the Operating System (OS) which acts as an interface between you and the computer hardware. The operating system is really a low level Software which is categorised as a System Software and supports a computer's basic functions, such as memory management, tasks scheduling and controlling peripherals etc.

Contents: Overview of Operating Systems, Processes, CPU Scheduling, Process Synchronization, Deadlocks, Memory Management, Paging and Virtual Memory etc.

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Computer System Architecture (CSC-RC-4016)

Computer Organization and Architecture lets students know how exactly each instruction is executed at the micro level. To study embedded systems/ processor design, these concepts are very important, as they form the basis of design strategy. It is also a well-known fact that assembly coding is closest to the computer, and it is always most optimum, if written properly. This is very important for real-time or time critical systems coding, as each millisecond is very important. Knowing the architecture completely helps you write assembly codes. If students are writing assembly codes, students know exactly how many instructions-cycle it will take to execute it, which is generally not possible in higher languages like C/Java etc.

Contents: Basic Computer Instructions,Instruction Design and Format,Computer Arithmetic,Microprogrammed Control,Memory Organization,Input and Output Systems,Pipelining,Programs etc.

Office Automation Tools (CSC-SE-3014)

Office automation has changed the work habits of end users. Typewriters have been replaced in offices by computers equipped with sophisticated word processors and management systems. A word processor allows the user to create text documents, edit and print documents, and perform mail merge for mass mailings.

Contents: Word Processing, Spreadsheet, PowerPoint, DTP etc.

System Administrationand Maintenance(CSC-SE-4014)

In simple terms, System Administration refers to the management of hardware and software systems. Some of the major tasks performed by a system administrator include adding and removing hardware, installing operating systems, creating, managing and removing users and groups, installing, upgrading and removing software, performing backups and monitoring the system.

Contents: Introduction to System Administration, Introduction to Linux Operating System, Basic of Linux file System, Files and Directory handling Commands, Basic commands for starting and stopping processes, IP address etc.

PHP Programming (CSC-SE-5024)

PHP can actually do anything related to server-side scripting or more popularly known as the backend of a website. For example, PHP can receive data from forms, generate dynamic page content, can work with databases, create sessions, send and receive cookies, send emails etc.

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Contents: Introduction to PHP, Handling HTML form with PHP, PHP conditional events and loops, PHP functions, String and Array in PHP etc.

Programming with SCILAB (CSC-SE-6014)

It can be used for signal processing, statistical analysis, image enhancement, fluid dynamics simulations, numerical optimization, and modeling, simulation of explicit and implicit dynamical systems and (if the corresponding toolbox is installed) symbolic manipulations.

Contents: Introduction to SCILAB, Graph Plots, Matrices, Conditional Statements etc.

Project Work/Dissertation (CSC-RE-5016)

Six months major project is part of curricula in last semester of BCA . The objective of the project is to help the student develop the ability to apply theoretical and practical tools / techniques to solve real life problems related to industry, academic institutions and research laboratories.

Computer Networks (CSC-RE-6026)

Computer Network is an interconnection between computers or we can say computer network is group of computers linked to each other which enables one computer to communicate with another computer. It acts as basis of communication in Information Technology (IT). It is system of connected computing devices and shares information and resources between them. The devices in network are connected by communication links (wired/wireless) and share data by Data Communication System.

Contents: Data communications, OSI model, TCP/IP model, Line Coding, Error correction, WAN,LAN,IEE,IPV4 v/s IPV6, Internet Protocols, Routing Protocols, DNS etc.

English Communication (ENG-AE-1014,ENG-AE-2024)

The BCA course is fairly comprehensive, and not much weightage is given to English. we have English as a subject only in the second semester. Although it is required to be eligible to study the course.English is the language of science, aviation, computers, diplomacy, and tourism. Knowing English increases student's chances of getting a good job in a multinational company within student's home country or of finding work abroad.

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