PO-CO Department of Computer Science

Class: B.Sc. (Computer Science) [Three year degree program]

Program Name: B.Sc. Part –I ,II and III (Computer Science)	
Program Objectives:	Nowadays, practically everyone is a computer user, and many people are even computer programmers. Computer Science can be seen on a higher level, as a science of problem solving and problem solving requires precision, creativity, and careful reasoning Computer Science (CS) has been evolving as an important branch of science and engineering throughout the world in last couple of decades and it has carved out a space for itself like any other disciplines of basic science and engineering. Computer science is a discipline that spans theory and practice and it requires thinking both in abstract terms and in concrete terms. B.Sc. with C.S. and B.Sc. (Hons.) in C.S. are aimed at undergraduate level training facilitating multiple career paths. Students so graduated, can take up postgraduate programmes in C.S. leading to research as well as R&D, can be employable at IT industries, or can pursue a teachers' training programme such B.Ed. in Computer Education, or can adopt a business management career. BSc with C.S. aims at laying a strong foundation of CS at an early stage of the career along with two other subjects such as Physics, Maths, Electronics, and Statistics etc. There are several employment opportunities and after successful completion of an undergraduate programme in C.S., graduating students can fetch employment directly in companies as Web Developer, Software Engineer, Network Administrator, Data Scientist, or AI/ML personnel.
First Year Subject: Paper-I (Hardware)	
Course Outcome:	**Mathematics and Theory** Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm. CO1. Describe basic organization of computer and the architecture of 8085 microprocessor. CO2. Implement assembly language program for given task for 8085 microprocessor. CO3. Demonstrate control unit operations and conceptualize instruction level parallelism. CO4. Demonstrate and perform computer arithmetic operations on integer and real numbers.

	CO5. Categorize memory organization and explain the function of each element of a memory hierarchy. CO6. Identify and compare different methods for computer I/O mechanisms. CO7. Describe memory hierarchy, cache memory, virtual memory, program and data memory etc. CO8. Describes history and generation of computer, major component of digital computer, architecture of CPU. CO9. Describe details about I/O devices, printers and processors. CO10. Describe different types of languages- high level, assembly and machine language, Open source software UNIX/LINUX (Ubuntu), application packages etc.
First Year Subject : Paper-II (Software)	
Course Outcome:	**Programming** Students will be able to complete successfully be able to program small-to-mid-size programs on their own. Sufficient programming skills will require use of good practice, e.g., good variable names, good use of computational units, appropriate commenting strategies. After completing the Course, students will learn: CO1. Articulate the principles of procedure-oriented problem solving and programming. CO2. Outline the essential features and elements of the C programming language. CO3. Explain programming fundamentals, including statement and control flow and recursion. CO4. Program with basic data structures using array CO5. Program using objects and data abstraction, class, and methods in function abstraction. CO6. Analyze, write, debug, and test basic C codes using the approaches introduced in the course. CO7. Analyze problems and implement simple C applications. CO8. Explain user defined data types like structure, union and enum. CO9. Describe the concept of pointers in detail. CO10. File handling concept and introduction of C pre-processor directives.

Second Year Subject: Paper-I (Hardware)	
Course Objectives:	**Mathematics and Theory** Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm. **Systems Design and Engineering** Students will be able to use appropriately system design notations and apply system design engineering process in order to design, plan, and implement software systems. Used to introduce students with the architecture and operation of typical microprocessors and microcontrollers. This course gives the following outcomes: CO1. Explain the concepts and architecture of microcomputers. CO2. Introduce the hardware components, use of microprocessor and function of various chips used in microcomputer.. CO3. Explain the major components of digital computer and microprocessors. CO4. Describe the instructions of INTEL 8051 microprocessor and write embedded program for 8051 microprocessor. CO5. Explain different types of memory and MMU. CO6. Explain I/O devices in detail. CO7. Explain system software and programming techniques, micro programming, program design, software development, utility program and application packages.
Second Year Subject: Paper-II (Software)	
	Programming Concepts of OOPS Students will be able to complete successfully be able to program small-to-mid-size programs on their own. Sufficient programming skills will require use of good practice, e.g., good variable names, good use of computational units, appropriate commenting strategies. After completing the Course, students will learn: CO1. Articulate the principles of object-oriented problem solving and programming. CO2. Outline the essential features and elements of the C++ programming language. CO3. Explain programming fundamentals, including statement

	and control flow and recursion. CO4. Apply the concepts of class, method, constructor, instance, data abstraction, function abstraction, inheritance, overriding, overloading, and polymorphism. CO5. Program with basic data structures using array CO6. Program using objects and data abstraction, class, and methods in function abstraction. CO7. Analyze, write, debug, and test basic C++ codes using the approaches introduced in the course. CO8. Analyze problems and implement simple C++ applications using an object-oriented software engineering approach
Third Year Subject: Paper-I (Hardware)	
Course Outcome::	**Mathematics and Theory related to Processors** Students will be able to apply mathematical and computing theoretical concepts in solution of common computing applications, such as computing the order of an algorithm. CO1. Explain basic components of microcomputer and microcomputer- basic block and prom ram memory, data memory, I/O ports, clock generator and functional blocks. CO2. Implement the register organization of 8088 microprocessor. CO3. Memory addressing modes and I/O addressing modes of P-8088. CO4. 8088 CPU and its interface, disk controllers etc. CO5. Introduction to UNIX, ENIX, SUN, solaris, DOS and MAC with special reference to DOS. CO6. Logical structure of disk,, memory allocation etc.
Third Year Subject: Paper-II (Software)	
Course Outcome:	**Working in Database** DBMS applications must be capable of solving challenging problems of different organizations. some objectives of DBMS are given below- CO1. Provide for mass storage of relevant data CO2. Making easy access to data for the authorized user. CO3. Providing prompt response to users requests for data. CO4. Eliminate redundantly (Duplicate) d data. CO5. Allow multiple users to be active at one time.

	CO6. Allow the growth of database system CO7. Provide data integrity. CO8. Protect the data from physical harm and unauthorized access. CO9. Serving different types of users. the CO10. Provide security with a user access privilege. CO11. Combining interrelated data to generate a report CO12. Provide multiple views for same data. **Graphical User Interface** Course Objectives Understand the benefits of using Microsoft Visual Basic 6.0 for Windows as an application tool. Understand the Visual Basic event-driven programming concepts, terminology, and available tools. Learn the fundamentals of designing, implementing, and distributing a Visual Basic application. Learn to use the Visual Basic toolbox. Learn to modify object properties. Learn object methods. Use the menu design window. Understand proper debugging and error-handling procedures. Gain a basic understanding of database access and management using data bound controls. Obtain an introduction to ActiveX controls and the Windows Application Programming Interface (API). It represents the following more outcomes: CO1. Explain the features of database management systems and Relational database. CO2. Design conceptual models of a database using ER modeling for real life applications and also construct queries in Relational Algebra. CO3. Create and populate a RDBMS for a real life application, with constraints and keys, using SQL. CO4. Retrieve any type of information from a data base by formulating complex queries in SQL. CO5. Analyze the existing design of a database schema and apply concepts of normalization to design an optimal database. CO6. Build indexing mechanisms for efficient retrieval of information from a database.