DEPARTMENT OF COMPUTER SCIENCE
B. Sc. in Computer Science

Program Outcomes:

Knowledge outcomes: After completing B.Sc. in Computer Science Program students will be able to:
PO1: To develop problem solving abilities using a computer.
PO2: To prepare necessary knowledge base for research and development in Computer Science.

Skill outcomes: After completing B.Sc. in Computer Science Program students will be able to:
PO3: To build the necessary skill set and analytical abilities for developing computer based solutions for real life problems.
PO4: communicate scientific information in a clear and concise manner both orally and in writing.
PO5: To train students in professional skills related to the software Industry.

Generic outcomes: After completing B.Sc. in Computer Science Program students will
PO6: Have developed their critical reasoning, logic judgment and communication skills.
PO7: Augment the recent developments in the field of IT and relevant fields of Research and Development.
PO8: Enhance the scientific temper among the students so students can develop a research culture and implement the policies to tackle the burning issues at global and local level.

DEPARTMENT OF COMPUTER SCIENCE

The Department follows the syllabus and adheres to the curriculum structure as mandated by the affiliating Assam University.

During the three years of the B.Sc Computer Science Honours and Pass programme, spread over 6 semesters. The Semester wise distribution of the Papers and their Course Outcomes are as follows:-

SEMESTER- I	
Name of the paper PROGRAMMING FUNDAMENTALS Using C/C++ Paper Code CSC-C-101	On Completion of this course the students will learn, have a fair understanding of the fundamental concepts of programming using C/C++ : CO1: Describe the procedural oriented programming with the concepts Data types, conditional statements, function and arrays using C program. CO2: Understand dynamic memory management techniques CO3: Describe object oriented paradigm with concepts of streams, classes, functions, data and objects using C++ program.
Name of the paper PROGRAMMING FUNDAMENTALS Using C/C++ Paper Code CSC-C-101-LAB	After completing this lab course students will be able to: CO1: Understand the logic for a given problem. CO2: Write the algorithm of a given problem. CO3: Recognize and understand the syntax and construction of C programming code. CO4: Implementing OOPs Concepts in C++
Name of the paper DISCRETE STRUCTURES Paper Code CSC-C-102	After completion of this course students will be able to CO1: Develop the logical thinking of students. CO2: Improve an ability to apply mathematical foundations to design computer based algorithms. CO3: Improve an ability to develop algorithms. CO4: Help to understand programming languages and software development. CO5: Help in solving a very wide variety of practical problems.

Name of the paper PROGRAMMING FUNDAMENTALS Using C/C++ Paper Code CSC-GE/DSC-101	On Completion of this course the students will learn, have a fair understanding of the fundamental concepts of programming using C/C++ : CO1: Describe the procedural oriented programming with the concepts Data types, conditional statements, function and arrays using C program. CO2: Understand dynamic memory management techniques CO3: Describe object oriented paradigm with concepts of streams, classes, functions, data and objects using C++ program.
Name of the paper PROGRAMMING FUNDAMENTALS Using C/C++ Paper Code CSC-GE/DSC-101 -LAB	After completing this lab course students will be able to: CO1: Understand the logic for a given problem. CO2: Write the algorithm of a given problem. CO3: Recognize and understand the syntax and construction of C programming code. CO4: Implementing OOPs Concepts in C++

SEMESTER- II	
Name of the paper COMPUTER SYSTEM ARCHITECTURE Paper Code CSC-C-201	On Completion of this course the students will learn CO1: Explain the organization of basic computer, its design and the design of control unit. CO2: Demonstrate the working of central processing unit and RISC and CISC Architecture. CO3: Describe the operations and language of the register transfer, micro operations and input- output organization. CO4: Understand the organization of memory and memory management hardware. CO5: Elaborate advanced concepts of computer architecture, Parallel Processing, interprocessor communication and synchronization.

Name of the paper DATA STRUCTURE Paper Code CSC-C-202	On Completion of this course the students will learn CO1: Understand basic data structures such as arrays, linked lists, stacks and queues. CO2: Describe the hash function and concepts of collision and its resolution methods CO3: Solve problem involving graphs, trees and heaps CO4: Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data
Name of the paper DATA STRUCTURE Paper Code CSC-C-202-LAB	After completing this lab course students will be able to: CO1: Write functions to implement linear and non-linear data structure operations CO2 : Suggest appropriate linear / non-linear data structure operations for solving a given problem CO3: Appropriately use the linear / non-linear data structure operations for a given problem
Name of the paper COMPUTER SYSTEM ARCHITECTURE Paper Code CSC-GE/DSC-201	On Completion of this course the students will learn CO1: Explain the organization of the basic computer, its design and the design of the control unit. CO2: Demonstrate the working of the central processing unit and RISC and CISC Architecture. CO3: Describe the operations and language of the register transfer, micro operations and input- output organization. CO4: Understand the organization of memory and memory management hardware. CO5: Elaborate advanced concepts of computer architecture, Parallel Processing, interprocessor communication and synchronization.

SemesterIII	
Name of the paper: Programming in Java	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : C01: Java Architecture,Differences between C++ and Java,Compiling and executing java program

Paper Code: CSC-C-301	CO2: Basic concepts of operators,expressions,Decision making,looping,java methods. C03:Concepts of one and multi- dimensional array C04: Java Strings class C05: identify and fix defects and common security issues in code C06: document a java program using javadoc C07: use a version control system to track source code in a project C08: basic AWT components, file-based I/O.
CSC-C-301 LAB Programming in Java	After completion of this course students will be able to develop logics which will help them to create programs, applications in JAVA.
Name of the paper: COMPUTER GRAPHICS Paper Code: CSC-C-302	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : CO1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics. CO2: Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis. CO3: Use of geometric transformations on graphics objects and their application in composite form. CO3: Extract scene with different clipping methods and its transformation to graphics display device, CO4: Explore projections and visible surface detection techniques for display of 3D scene on 2D screen. CO5: Render projected objects to naturalize the scene in 2D view and use of illumination models for this.
CSC-C-302-LAB COMPUTER GRAPHICS	After completion of this course students will be able to develop logics which will help them to create programs, applications in graphics.
Name of the paper: OPERATING SYSTEMS Paper Code: CSC-C-303	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : CO1: Identify the role of Operating System. To understand the design of the control unit. CO2: Understanding CPU Scheduling, Synchronization,Deadlock handling and comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems. CO3: Describe the role of paging,segmentation and virtual memory in operating systems. CO4: Description of protection and security and also the comparison of UNIX and Windows based OS.

	CO5: Defining I/O systems,Device management policies and secondary storage structure and evaluation of various Disk Scheduling Algorithms.
Name of the paper: OPERATING SYSTEMS Paper Code: CSC-GE/DSC-301	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : CO1: Identify the role of Operating System. To understand the design of control unit. CO2: Understanding CPU Scheduling, Synchronization,Deadlock handling and comparing CPU Scheduling Algorithms. Solve Deadlock Detection Problems. CO3: Describe the role of paging,segmentation and virtual memory in operating systems. CO4: Description of protection and security and also the comparison of UNIX and Windows based OS. CO5: Defining I/O systems,Device management policies and secondary storage structure and evaluation of various Disk Scheduling Algorithms.

Semester IV	
Name of the paper: Computer Networks Paper Code: CSC-C-401	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : C01 Understanding the network models. CO2: Understand different network technologies. C03:Understand the effects of using different networking topologies. C04: Be updated with different advanced network technologies that can be used t connect different networks. C05: Be familiar with various hardware and software that can help protect the network , layers of OSI model and their functionality.
Name of the paper: Database Management Systems Paper Code: CSC-C-402	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : C01 : Understand, appreciate and effectively explain the underlying concepts of database technologies. CO2: Design & implement a database schema for a given problem domain. C03: Populate and query a database schema for a given problem domain. C04: Populate and query a database using SQL DML/DDL commands.

	C05: Normalize a database. CO6: Programming PL/SQL including stored procedures, stored functions,cursors,packages.
Paper Code: CSC-C-402-LAB Database Management Systems	After completion of this course students will be able to develop logics which will help them to create programs, applications in DBMS.
Name of the paper: Design and Analysis of Computer Algorithms Paper Code: CSC-C-403	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : CO1: Analyze the asymptotic performance of algorithms. C02: Use divide-and-conquer techniques for solving suitable problems. CO3: Demonstrate a familiarity with major algorithms and data structures. CO4: Apply important algorithmic design paradigms and methods of analysis. CO5: Synthesize efficient algorithms in common engineering design situations. CO6: Using greedy approach to solve an appropriate problem for optimal solution. C07: Apply dynamic programming approach to solve suitable problems.
CSC-GE/DSC-401 Database Management Systems	On completion of this course the students will learn, have a fair understanding of and develop the concepts of : C01 : Understand, appreciate and effectively explain the underlying concepts of database technologies. CO2: Design & implement a database schema for a given problem domain. C03: Populate and query a database schema for a given problem domain. C04: Populate and query a database using SQL DML/DDL commands. C05: Normalize a database. CO6: Programming PL/SQL including stored procedures, stored functions,cursors,packages.

Paper Code: CSC-GE/DSC-401-LAB Database Management Systems	After completion of this course students will be able to develop logics which will help them to create programs, applications in DBMS.

Semester V	
Name of the paper: Theory of Computation Paper Code: CSC-C-501	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: Interpret the mathematical foundations of computation including automata theory; the theory of formal languages and ; the notions of algorithm, decidability, complexity, and computability C02: Construct the abstract machines including finite automata, pushdown automata, and Turing machines from their associated languages and grammar C03: Make use of pumping lemma to show that a language is not regular / not context-free C04: Construct the grammar for any given finite automata, pushdown automata or Turing machines C05: Outline the characteristics of P, NP and NP Complete problems Solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation

Name of the paper: Internet Technologies Paper Code: CSC-C-502	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: Analyze a web page and identify its elements and attributes C02: · Create web pages using XHTML and Cascading Style Sheets. C03: · Build dynamic web pages using JavaScript. C04 : · Create XML documents and Schemas.
Name of the paper: Internet Technologies (Lab) Paper Code: CSC-C-502L	After completion of this course students will be able to develop logics which will help them to create programs, applications in web technology. C01: Create web pages using XHTML and Cascading Style Sheets. C02: Writing programs using Java script, VB Script. C03: Practical implementation of JDBC and JSP.
Name of the paper: Numerical Methods Paper Code: CSC-DSE-501	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: Understand numerical techniques to find the roots of non-linear equations and solution of system of linear equations. C02: Understand the difference operators and the use of interpolation. C03: Understand numerical differentiation and integration and numerical solutions of ordinary and partial differential equations.
Name of the paper: Numerical Methods (Lab) Paper Code: CSC-DSE-501L	On completion of this course the students will learn, have a fair understanding of and develop the programs of: C01: Solving linear and non-linear equations. C02: Use of different iterative methods. C03: Writing programs to solve numerical differentiation and integration.
Name of the paper:	On completion of this course the students will learn, have a fair understanding of and develop the concept of:

Network Programming Paper Code: CSC-DSE-502	C01: Different transport layer protocols C02: Concept of socket and socket programming. C03: Client server applications. C04: Network management.

Semester VI	
Name of the paper: Artificial Intelligence Paper Code: CSC-C-601	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: Demonstrate fundamental understanding of the history of artificial intelligence and its foundations C02: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning C03Demonstrate profciency developing applications in an 'AI language', expert system shell, or data mining tool. C04: Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.

	C05 Demonstrate proficiency in applying scientific method to models of machine learning
Name of the paper: Software Engeneering Paper Code: CSC-C-602	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: Understand basic SW engineering methods and practices, and their appropriate application. C02: Understand u of software process models such as the waterfall and evolutionary models.. C03: Role of project management including planning, scheduling and, risk management. C04 : Discuss data models, object models, context models and behavioral models. C05: Understand of different software architectural styles and Process framework, implementation issues such as modularity and coding standards C06: Understand verification and validation including static analysis, and reviews. C07: Understand quality control and how to ensure good quality software.
Name of the paper: Information Security and Cyber Laws Paper Code: CSC-DSE-601	On completion of this course the students will learn, have a fair understanding of and develop the concepts of: C01: System vulnerability, threat, attack, digital crime. C02: Learn about different information gathering techniques. C03: Risk and risk analysis. C04: Cryptography and its application C05: Cyber Law and IT Act 2008
Name of the paper: Project work/ dissertation Paper Code: CSC-DSE-602	In this course the students will utilize their programming knowledge to build: C01: Software or application programs for real life requirements. C02: Problem identification, software development and Software testing C03: Demonstration of real life problems with solutions.
