PROGRAM OUTCOME (POs),

PROGRAM SPECIFIC OUTCOMES (PSOs)

And

COURSE OUTCOMES (COs)

FOR

B.Sc. COMPUTER SCIENCE

PROGRAMME (Honours & Generic)

And

BACHELOR OF COMPUTER APPLICATIONS

(B.C.A.)

PROGRAMME (Honours & Generic)

Under CBCS

RUNNING UNDER

THE DEPARTMENT OF COMPUTER SCIENCE

PRAGJYOTISH COLLEGE

Department of Computer Science

One of the most important benefits of taking computer courses is that the students will have more jobs available to them. The types of new jobs that will be available depend on what kind of courses they take, but every group of courses will open up new opportunities. Almost all jobs require that a worker has some computer skills. The number of positions available to those ***who aren't comfortable using computers gets smaller each day***.

Bachelor of Computer Science (B.Sc. CSC, Honours) Programme : (**CBCS** System under Gauhati University) :	
Program Outcome (PO)	Students, who choose **B.Sc. Computer Science (Honours)** Programme (under **CBCS**), 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 14 core courses. An exceptionally broad range of topics covering current trends and technologies in Computer Science 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 Specific Outcomes (PSOs)	Completion of **B.Sc. Computer Science (Honours) Programme** (under **CBCS**) shall enable a student :– (1) To communicate technical information both orally and in writing. (2) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. (3) 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. (4) To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis. (5) Identify applications of Computer Science in other fields in the real world to enhance the career prospects. (6) An ability to communicate effectively with a range of audiences (7) Realize the requirement of lifelong learning through continued education and research. (8) Use the concepts of best practices and standards to develop user interactive and abstract application. (9) Understand the professional, ethical, legal, security, social issues and responsibilities. (10) An ability to use current techniques, skills, and tools necessary for computing practice. //

COURSE OUTCOMES (COs)

B.Sc. in Computer Science (Honours) syllabus (CBCS)

1st Semester (Honours)

CORE PAPERS

Paper Name : Programming Fundamentals using C/C++

Paper Code : CSC-HC-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the Basic fundamental concepts of the Computer Programming ability in C/C++ Language. The **first part** of this paper helps students to inculcate knowledge on the basic concepts of C programming includes arrays, structures, function, strings, pointers and files. • Understand the basic terminology used in computer programming. • Write, compile and debug programs in C language. • Create programs involving decision	Unit-1: Introduction to C and C++	Remember, Understand, Analysis, Evaluate
	Unit-2: Data Types, Variables, Constants, Operators and Basic I/O	Remember, Understand, Analysis, Evaluate
	Unit-3: Expressions, Conditional Statements and Iterative Statements	Remember, Understand, Analysis, Evaluate
	Unit-4: Functions and Arrays	Remember, Understand, Analysis, Evaluate
	Unit-5: Derived Data Types (Structures and Unions)	Remember, Understand, Analysis, Evaluate

structures & unions, loops, strings and functions. • Design programs involving structures and pointers. The **second part** of this paper helps students to inculcate knowledge on Object Oriented Programming concepts (OOPs) using C++ by understand fundamentals and basic concepts of object oriented programming concepts includes classes, objects, Operator overloading, inheritance, Polymorphism, virtual functions, inline functions, friend functions, strings, Exceptions, pointers, file handling, and error handling mechanism. //	Unit-6: Pointers and References in C++	Remember, Understand, Analysis, Evaluate
	Unit-7: Memory Allocation in C++	Remember, Understand, Analysis, Evaluate
	Unit-8: File I/O, Preprocessor Directives	Remember, Understand, Analysis, Evaluate
	Unit-9: Using Classes in C++	Remember, Understand, Analysis, Evaluate
	Unit-10: Overview of Function Overloading and Operator Overloading	Remember, Understand, Analysis, Evaluate
	Unit-11: Inheritance and Exception Handling	Remember, Understand, Analysis, Evaluate

Paper Name : Computer System Architecture

Paper Code : CSC-HC-1026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper includes 4 main topics : (1) Boolean Algebra, (2) Digital Logic (3) Data Representation and Basic Computer Arithmetic (4) Computer Organization and Architecture Basic organization of computer and the underlying Architecture includes : • On successful completion of this course, the students will be able to Master the binary and hexadecimal number systems including computer arithmetic. • Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. • Understand the principles and the implementation of computer arithmetic. • Knowledge about Primary and Secondary storage System. • Organization of the Input and Output. //	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Data Representation and Basic Computer Arithmetic	Remember, Understand, Analysis, Evaluate
	Unit-3: Basic Computer Organization and Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Central Processing Unit	Remember, Understand, Analysis, Evaluate
	Unit-5: Memory Organization	Remember, Understand, Analysis, Evaluate
	Unit-6: Input-Output Organization	Remember, Understand, Analysis, Evaluate

2nd Semester (Honours)

CORE PAPERS

Paper Name : Programming in JAVA

Paper Code : CSC-HC-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper inculcate knowledge on Java Programming concepts, Programming logic that enables the students to create wide range of Applications and Applets using Java by understanding Object Oriented Programming in Java, including defining methods, using	Unit- 1: Introduction to Java	Remember, Understand, Analysis, Evaluate
	Unit- 2: Arrays, Strings and I/O	Remember, Understand, Analysis, Evaluate

class libraries, etc. It also includes the design and Implementation of GUIs using the AWT controls, Swing components of Java Foundation Classes such as labels, buttons, text fields, layout managers, menus, events and listeners, Graphic objects for drawing figures such as lines, rectangles, ovals, using different fonts On successful completion of the course the students should have acquired skill in advanced java programming concepts like overview of Servlets, Exception Handling, Threading, Networking and Database Connectivity and Event Handling. //	Unit- 3: Object-Oriented Programming Overview	Remember, Understand, Analysis, Evaluate
	Unit- 4: Inheritance, Interfaces, Packages, Enumerations, Autoboxing and Metadata	Remember, Understand, Analysis, Evaluate
	Unit- 5: Exception Handling, Threading, Networking and	Remember, Understand, Analysis, Evaluate
	Unit- 6: Applets and Event Handling	Remember, Understand, Analysis, Evaluate

Paper Name : Discrete Structures

Paper Code : CSC-HC-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps to increase Students mathematical abilities. • Reason mathematically about basic discrete structures such as Numbers, Sets, used in computer science. • Familiarity with Growth of Functions, Recurrences, Graph Theory and Prepositional Logic. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Growth of Functions	Remember, Understand, Analysis, Evaluate
	Unit- 3: Recurrences	Remember, Understand, Analysis, Evaluate
	Unit- 4: Graph Theory	Remember, Understand, Analysis, Evaluate
	Unit- 5: Prepositional Logic	Remember, Understand, Analysis, Evaluate

3rd Semester (Honours)

CORE PAPERS

Paper Name : Data Structure

Paper Code : CSC-HC-3016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Students will be able to implement linear and non-linear data structure, determine and analyze the complexity of give algorithm • Know about the basic concepts of Function, Recursion, Array and Link-list. • Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees, various Sorting algorithms and Hashing. //	Unit- 1: Arrays	Remember, Understand, Analysis, Evaluate
	Unit- 2: Stacks	Remember, Understand, Analysis, Evaluate
	Unit- 3: Linked Lists	Remember, Understand, Analysis, Evaluate
	Unit- 4: Queues	Remember, Understand, Analysis, Evaluate
	Unit- 5: Recursion	Remember, Understand, Analysis, Evaluate
	Unit- 6: Trees	Remember, Understand, Analysis, Evaluate

	Unit- 7: Searching and Sorting	Remember, Understand, Analysis, Evaluate
	Unit- 8: Hashing	Remember, Understand, Analysis, Evaluate

Paper Name : Operating System
Paper Code : CSC-HC-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Enable student to get sufficient knowledge about the role of Operating System in their management policies and understand the process management policies. • To make students able to learn different types of operating systems along with concept of file systems, Directory structure and CPU scheduling algorithms used in operating system. • To provide students knowledge of Process management, Memory management, I/O management and deadlock handling algorithms. • Protection and Security is enforced by introducing Policy mechanism, Authentication, Internal access Authorization. • At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in Operating System. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Operating System Organization	Remember, Understand, Analysis, Evaluate
	Unit- 3: Process Management	Remember, Understand, Analysis, Evaluate
	Unit- 4: File and I/O Management	Remember, Understand, Analysis, Evaluate
	Unit- 5: Protection and Security	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Networks
Paper Code : CSC-HC-3036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• Help to get the knowledge on Networking concepts and the underlying technologies including the Wired (Guided) and Wireless (Unguided) media • To explain how communication works in computer networks and to understand the basic terminology of computer networks • To explain the role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. • To understand the working various internetworking devices such as Repeaters, Hubs, Switches, Bridges, Router and Gateways.	Unit- 1: Introduction to Computer Networks	Remember, Understand, Analysis, Evaluate
	Unit- 2: Data Communication Fundamentals and Techniques	Remember, Understand, Analysis, Evaluate
	Unit- 3: Networks Switching Techniques and Access mechanisms	Remember, Understand, Analysis, Evaluate
	Unit- 4: Data Link Layer Functions and Protocol	Remember, Understand, Analysis, Evaluate
	Unit- 5: Multiple Access Protocol and Networks	Remember, Understand, Analysis, Evaluate
	Unit- 6: Networks Layer Functions and Protocols	Remember, Understand, Analysis, Evaluate

• Overview of the Application Layer protocols visible by the User such as Domain Name system (DNS), WWW and HTTP. //	Unit- 7: Transport Layer Functions and Protocols	Remember, Understand, Analysis, Evaluate
	Unit- 8: Overview of Application layer protocol	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : HTML Programming

Paper Code : CSC-SE-3034

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Upon completion of the course students will be able to: • Understood the fundamentals of Web design and how to program using Hypertext Markup Language (HTML), and Cascading Style sheets (CSS). • Use knowledge of HTML and CSS code and an HTML editor to create personal and/or business websites following current professional and/or industry standards. • Students will demonstrate competency in the use of common HTML code. • Use critical thinking skills to design and create	Unit- 1: The Basics	Remember, Understand, Analysis, Evaluate
	Unit- 2: HTML Formatting	Remember, Understand, Analysis, Evaluate
	Unit- 3: Links	Remember, Understand, Analysis, Evaluate
	Unit- 4: Images	Remember, Understand, Analysis, Evaluate
	Unit- 5: Tables	Remember, Understand, Analysis, Evaluate
	Unit- 6: Forms	Remember, Understand, Analysis, Evaluate

4th Semester (Honours)

CORE PAPERS

Paper Name : Design and Analysis of Algorithms

Paper Code : CSC-HC-4016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
In this paper Students will learn the following : • Basic Design and Analysis techniques of Algorithms, Correctness of Algorithm. • Algorithm Design Techniques such as Iterative techniques, Divide and Conquer, Dynamic Programming, Greedy Algorithms. • Various types of Sorting and Searching Techniques along with their complexity analysis. • Graphs Algorithms such as Breadth First Search (BFS), Depth First Search (DFS) and its Applications, as well as Minimum Spanning Trees. • String Processing including String Matching, KMP Technique.//	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Algorithm Design Techniques	Remember, Understand, Analysis, Evaluate
	Unit-3: Sorting and Searching Techniques	Remember, Understand, Analysis, Evaluate
	Unit- 4: Balanced Trees	Remember, Understand, Analysis, Evaluate
	Unit- 5: Graphs	Remember, Understand, Analysis, Evaluate
	Unit- 6: String Processing	Remember, Understand, Analysis, Evaluate

Paper Name : Software Engineering
Paper Code : CSC-HC-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the basic skill in the application of engineering discipline to the creation of software. A software engineer is responsible for developing and/or implementing the new features to improve the existing programs and software. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Requirement Analysis	Remember, Understand, Analysis, Evaluate
	Unit- 3: Software Project Management	Remember, Understand, Analysis, Evaluate
	Unit- 4: Risk Management	Remember, Understand, Analysis, Evaluate
	Unit- 5: Quality Management	Remember, Understand, Analysis, Evaluate
	Unit- 6: Design Engineering	Remember, Understand, Analysis, Evaluate
	Unit- 7: Testing Strategies & Tactics	Remember, Understand, Analysis, Evaluate

Paper Name : Database Management System
Paper Code : CSC-HC-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. Students gain a good understanding of the architecture and functioning of database management systems as well as associated tools and techniques, principles of data modeling using entity relationship and develop a good database design and normalization techniques to normalize a database. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Entity Relationship(ER) Modeling	Remember, Understand, Analysis, Evaluate
	Unit- 3: Relation data model	Remember, Understand, Analysis, Evaluate
	Unit- 4: Database design	Remember, Understand, Analysis, Evaluate
	Unit- 5: Transaction processing	Remember, Understand, Analysis, Evaluate
	Unit- 6: File Structure and Indexing	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : PHP Programming
Paper Code : CSC-SE-4024

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Hypertext Preprocessor is Self-referentially short for PHP. It is an open	Unit- 1: Introduction to PHP	Remember, Understand, Analysis, Evaluate

source, server-side, HTML embedded scripting language used to create dynamic Web pages. In an HTML document, PHP. On Successful completion of the course the students should have: • Front end Designing of the Website. • Understood the features like functions, forms in PHP, Files handling, • OOPs concepts, Cookies, Sessions and Data base, draw images on the server with AJAX. Acquired skills to write PHP programs. //	Unit- 2: Handling HTML form with PHP	Remember, Understand, Analysis, Evaluate
	Unit- 3: PHP conditional events and Loops	Remember, Understand, Analysis, Evaluate
	Unit- 4: PHP Functions	Remember, Understand, Analysis, Evaluate
	Unit- 5: String Manipulation and Regular Expression	Remember, Understand, Analysis, Evaluate
	Unit- 6: Array	Remember, Understand, Analysis, Evaluate

5th Semester (Honours)

CORE PAPERS

Paper Name : Internet Technologies

Paper Code : CSC-HC-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• Helps to inculcate knowledge in two domains : ➢ Web Technological concepts and ➢ Functioning of the Internet. • It also Helps to Implement interactive Web Pages using HTML, Java-Script (Client-side programming), Java Server Pages (JSP), Java Beans, Java Database connectivity (JDBC) fundamentals and protocols in the workings of the web and web applications. //	Unit- 1: Fundamentals	Remember, Understand, Analysis, Evaluate
	Unit- 2: JavaScript	Remember, Understand, Analysis, Evaluate
	Unit- 3: Java	Remember, Understand, Analysis, Evaluate
	Unit- 4: JDBC	Remember, Understand, Analysis, Evaluate
	Unit- 5: JSP	Remember, Understand, Analysis, Evaluate
	Unit- 6: Java Beans	Remember, Understand, Analysis, Evaluate

Paper Name : Theory of Computation

Paper Code : CSC-HC-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This course focuses on the basic theory of Computer Science and formal methods of computation like automata theory, formal languages, grammars, finite automata and push down automata	Unit- 1: Languages	Remember, Understand, Analysis, Evaluate
	Unit- 2: Finite Automata and Regular Languages	Remember, Understand, Analysis, Evaluate

The student will be able to: • Understand the basic properties of formal languages and grammars. • Differentiate regular, context-free and recursively enumerable languages. • Make grammars to produce strings from a specific language. • Acquire concepts relating to the theory of computation and computational models including decidability and intractability.//	Unit- 3: Context free languages	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Microprocessor

Paper Code : CSC-HE-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• A thorough understanding of the Intel 8085 microprocessor demands concepts and skills from two different disciplines : ➢ Hardware concepts from *Electronics* and ➢ Programming skills from *Computer Science*. • Introduction to the basic Architecture, Instruction sets and the Assembly Language Programming of the Intel 8085 microprocessor Kit. //	Unit- 1: Internal Organization of 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 2: 8085A microprocessor architecture	Remember, Understand, Analysis, Evaluate
	Unit- 3: Assembly language programming in 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 4: Interfacing	Remember, Understand, Analysis, Evaluate
	Unit- 5: Interrupt	Remember, Understand, Analysis, Evaluate

Paper Name : Project Work / Dissertation

Paper Code : CSC-HE-5036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
At the end of this course student will: • Students should be able to design and construct a hardware and software system, component, or process to meet desired needs. • Students are provided to work on multidisciplinary Problems. • c) 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.//	• No Units Specified in this Paper ***Guidelines*** : • The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. • The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes. • A maximum of Four (04) projects would be assigned to one teacher.	Remember, Understand, Analysis, Evaluate

6th Semester (Honours)

CORE PAPERS

Paper Name : Artificial Intelligence

Paper Code : CSC-HC-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Presentation of artificial intelligence as a coherent body of ideas and methods to acquaint the student with the basic programs in the field and their underlying theory. Students will explore this through problem-solving paradigms, logic and theorem proving, language and image understanding, search and control methods and learning. In this paper Students will learn the following : (1) To conceptualize the basic ideas and techniques underlying the design of intelligent systems. (2) To make students understand and explore the mechanism of mind that enable intelligent thought and action. (3) To make students understand advanced representation formalism and search techniques. (4) To make students understand how to deal with uncertain and incomplete information. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Problem Solving and Searching Techniques	Remember, Understand, Analysis, Evaluate
	Unit- 3: Knowledge Representation	Remember, Understand, Analysis, Evaluate
	Unit- 4: Dealing with Uncertainty and Inconsistencies	Remember, Understand, Analysis, Evaluate
	Unit- 5: Understanding Natural Languages	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Graphics
Paper Code : CSC-HC-6026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To inculcate knowledge on Graphics concepts, Basic elements of Computer Graphics, its Applications and to apply the creativity of using algorithms. In this paper, Students will learn the following : • Overview, working and the functions of the Graphics Hardware • Fundamental Techniques in Graphics, and their various algorithms //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Graphics Hardware	Remember, Understand, Analysis, Evaluate
	Unit- 3: Fundamental Techniques in Graphics	Remember, Understand, Analysis, Evaluate
	Unit- 4: Geometric Modeling	Remember, Understand, Analysis, Evaluate
	Unit- 5: Visible Surface determination	Remember, Understand, Analysis, Evaluate
	Unit- 6: Surface rendering	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Network Programming
Paper Code : CSC-HE-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Upon completion of the course students will be able to: • Learn the basics of computer networks and Internet programming. • Demonstrate advanced knowledge of programming for network communications • Have a detailed knowledge of the TCP/UDP Sockets. • Competency in the theoretical as well as the practical aspects of computer network programming, with emphasis on the Internet. //	Unit- 1: Transport Layer Protocols	Remember, Understand, Analysis, Evaluate
	Unit- 2: Socket Programming	Remember, Understand, Analysis, Evaluate
	Unit- 3: Network Applications	Remember, Understand, Analysis, Evaluate

Paper Name : Data Mining
Paper Code : CSC-HE-6046

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On Successful completion of the course the students will learn the following : • To identify the scope and essentiality of Data Mining. • Identify appropriate data mining algorithms to	Unit- 1: Overview	Remember, Understand, Analysis, Evaluate
	Unit- 2: Association Rule Mining	Remember, Understand, Analysis, Evaluate

solve real world problems • Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining • To analyze data, choose relevant models and algorithms for respective applications. • To develop research interest towards advances in data mining. • Benefit the user experiences towards research and innovation/integration. //	Unit- 3: Clustering	Remember, Understand, Analysis, Evaluate
	Unit- 4: Classification and regression technique	Remember, Understand, Analysis, Evaluate

Bachelor of Computer Science (B.Sc. CSC, Generic) Programme : (**CBCS** System under Gauhati University) :	
Program Outcome (PO)	B.Sc. (General) Computer Science Programme could prepare the students for graduate training in some specialized area of computer science, to prepare students for jobs in industry, business or government, and to provide support courses for students in technology, mathematics and other fields requiring computing skills.
Program Specific Outcomes (PSOs)	Completion of **B.Sc. Computer Science (Generic) Programme** shall enable a student :– Graduates of the Computer Technology Program will, by the time of graduation, have the following knowledge, abilities, and appreciation of professional standards. (1) An ability to apply knowledge of computing and mathematics appropriate to the discipline. (2) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution. (3) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs. (4) An ability to function effectively on teams to accomplish a common goal. (5) An understanding of professional, ethical, legal, security and social issues and responsibilities. (6) An ability to communicate effectively with a range of audiences. (7) An ability to analyze the local and global impact of computing on individuals, organizations, and society. (8) Recognition of the need for and an ability to engage in continuing professional development. (9) An ability to use current techniques, skills, and tools necessary for computing practice. //

COURSE OUTCOMES (COs)
B.Sc. in Computer Science (Generic) syllabus (CBCS)
GENERIC ELECTIVE PAPERS

1st Semester (Generic)

Paper Name : Problem Solving using Computer
Paper Code : CSC-HG-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the Basic concept of the Computer Fundamentals and the Programming ability in Python Language by understand fundamentals and **Basic concepts** of Python programming includes arrays, structures, function, strings, Exceptions, pointers and files. ***Advanced concept**s of Python* includes : OOPs, Regular Expressions, Event Driven Programming, GUI Programming //	Unit- 1: Computer Fundamentals	Remember, Understand, Analysis, Evaluate
	Unit- 2: Basic Computer Organization	Remember, Understand, Analysis, Evaluate
	Unit- 3: Planning the Computer Program	Remember, Understand, Analysis, Evaluate
	Unit- 4: Techniques of Problem Solving	Remember, Understand, Analysis, Evaluate
	Unit- 5: Overview of Programming	Remember, Understand, Analysis, Evaluate
	Unit- 6: Introduction to Python	Remember, Understand, Analysis, Evaluate
	Unit- 7: Creating Python Programs	Remember, Understand, Analysis, Evaluate
	Unit- 8: Structures	Remember, Understand, Analysis, Evaluate
	Unit- 9: Introduction to Advanced Python	Remember, Understand, Analysis, Evaluate

2nd Semester (Generic)

Paper Name : Database Management System
Paper Code : CSC-HG-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. //	Unit- 1: Introduction to Database Management Systems	Remember, Understand, Analysis, Evaluate
	Unit- 2: Entity Relationship and Enhanced ER Modeling	Remember, Understand, Analysis, Evaluate
	Unit- 3: Relational Data Model	Remember, Understand, Analysis, Evaluate
	Unit- 4: Database Design	Remember, Understand, Analysis, Evaluate

3rd Semester C.Sc. (Generic)

Paper Name : Computer Networks and Internet Technologies
Paper Code : CSC-HG-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
The **first part** of this paper helps students to inculcate knowledge on the basic concepts of **Computer Networks** :- • Help to get the knowledge on Networking concepts and the underlying technologies used for data communication media. • To role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. • To understand the working various internetworking. • Overview of the Application Layer protocols visible by the user. The **second part** of this paper includes the basic concepts of **Internet** that helps to inculcate knowledge in two domains : • Web Technological concepts and • Functioning of the Internet. It also Helps to Implement interactive Web Pages using HTML, Java-Script (Client-side programming), Java Server Pages (JSP), Java Beans, Java Database connectivity (JDBC) fundamentals and protocols in the workings of the web and web applications. //	Unit- 1: Computer Networks	Remember, Understand, Analysis, Evaluate
	Unit- 2: Network Models	Remember, Understand, Analysis, Evaluate
	Unit- 3: Transmission Media	Remember, Understand, Analysis, Evaluate
	Unit- 4: LAN Topologies	Remember, Understand, Analysis, Evaluate
	Unit- 5: Network Devices	Remember, Understand, Analysis, Evaluate
	Unit- 6: Internet Terms	Remember, Understand, Analysis, Evaluate
	Unit- 7: Internet Applications	Remember, Understand, Analysis, Evaluate
	Unit- 8: Introduction to Web Design	Remember, Understand, Analysis, Evaluate
	Unit- 9: JavaScript Fundamentals	Remember, Understand, Analysis, Evaluate

4th Semester C.Sc. (Generic)

Paper Name : Web and E-Commerce Technologies
Paper Code : CSC-HG-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Upon completing the course, the participants will be able to: • Understand the various elements that are fundamental for a successful E-Commerce enterprise and develop a business plan for developing one such E-Commerce site. • Gain a comprehensive understanding of the E-Commerce landscape, current and emerging business models, and the technology and infrastructure underpinnings of the business. • Gain an understanding on how innovative use of the E-Commerce can help developing competitive advantage. • Develop an understanding on how internet can help business grow. //	Unit- 1: An introduction to Electronic commerce	Remember, Understand, Analysis, Evaluate
	Unit- 2: The Internet and WWW	Remember, Understand, Analysis, Evaluate
	Unit- 3: Internet Security	Remember, Understand, Analysis, Evaluate
	Unit- 4: Electronic Data Exchange	Remember, Understand, Analysis, Evaluate
	Unit- 5: Planning for Electronic Commerce	Remember, Understand, Analysis, Evaluate
	Unit- 6: Internet Marketing	Remember, Understand, Analysis, Evaluate

Paper Name : Computer System Architecture
Paper Code : CSC-HG-4046

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper includes 4 main topics : (1) Boolean Algebra, (2) Digital Logic (3) Data Representation and Basic Computer Arithmetic (3) Computer Organization and Architecture Basic organization of computer and the underlying Architecture includes : • On successful completion of this course, the students will be able to Master the binary and hexadecimal number systems including computer arithmetic. • Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. • Understand the principles and the implementation of computer arithmetic. • Knowledge about Primary and Secondary storage • System Organization of the Input and Output. //	Unit- 1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit- 2: Data Representation and Basic	Remember, Understand, Analysis, Evaluate
	Unit- 3: Basic Computer Organization and Design	Remember, Understand, Analysis, Evaluate
	Unit- 4: Central Processing Unit	Remember, Understand, Analysis, Evaluate
	Unit- 5: Programming the Basic Computer	Remember, Understand, Analysis, Evaluate
	Unit- 6: Input-output Organization	Remember, Understand, Analysis, Evaluate

BACHELOR OF COMPUTER APPLICATIONS (BCA)

One of the most important benefits of taking computer courses is that the students will have more jobs available to them. The types of new jobs that will be available depend on what kind of courses they take, but every group of courses will open up new opportunities. Almost all jobs require that a worker has some computer skills. The number of positions available to those ***who aren't comfortable using computers gets smaller each day***.

Bachelor of Computer Applications (B.C.A, Honours) Programme: (**CBCS** System under Gauhati University) :	
Program Outcome (PO)	Students who choose **BCA Programme** (under **CBCS**), 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, research, government sector, business sector and industry. The program covers the various essential concepts in Computer Science. The course lays a structured foundation of Computer fundamentals, Numerical methods, Data structure, Algorithm and Complexity analysis, Software Engineering, Programming Concepts in various languages(C, C++, Java etc.), Computer Networking, System Administration, Operating System, Computer Architecture, Microprocessor, Web technology, Computer Graphics and Database management system etc. An exceptionally broad range of topics covering current trends and technologies in computer science: Advanced web technology, Mobile application, Animation, Data mining etc. Also, to carry out the hand on sessions in Computer lab using various Programming languages and tools to have a deep conceptual understanding of the topics to widen the horizon of students' self-experience. //

Program Specific Outcomes (PSOs)	The completion of the **BCA Programme** (under **CBCS**) shall enable a student to: (1) To communicate technical information both orally and in writing (2) Apply the knowledge gained in core courses to a broad range of advanced topics in (3) Computer science, to learn and develop sophisticated technical products independently. (4) To design, implement, and evaluate computer-based system, process, component, or program to meet desired needs by critical understanding, analysis and synthesis (5) Identify applications of Computer Science in other fields in the real world to enhance the career prospects (6) Realize the requirement of lifelong learning through continued education and research. (7) Use the concepts of best practices and standards to develop user interactive and abstract application (8) Understand the professional, ethical, legal, security, social issues and responsibilities. //

COURSE OUTCOMES (COs)
B.C.A (Honours) Syllabus (CBCS)
1st Semester BCA (Honours)
CORE PAPERS

Paper Name : Introduction to C programming

Paper Code : BCA-HC-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the Basic fundamental concepts of the Computer Programming ability in C Language. This paper helps students to inculcate knowledge on the basic concepts of C programming includes arrays, structures, function, strings, pointers and files. • Understand the basic terminology used in computer programming. • Write, compile and debug programs in C language. • Create programs involving decision structures & unions, loops, strings and functions. • Design programs involving structures and pointers. //	Unit- 1: Overview of C	Remember, Understand, Analysis, Evaluate
	Unit- 2: Decision Making and Branching Statement	Remember, Understand, Analysis, Evaluate
	Unit- 3 Arrays	Remember, Understand, Analysis, Evaluate
	Unit- 4: Functions	Remember, Understand, Analysis, Evaluate
	Unit- 5: Structures and Unions	Remember, Understand, Analysis, Evaluate
	Unit- 6: Pointers	Remember, Understand, Analysis, Evaluate
	Unit- 7: File Management in C	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Fundamentals & ICT Hardware
Paper Code : BCA-HC-1026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Let students know about the basics and hardware components (internal and external to the system unit) of the computer system : • Familiarity with the history and development of modern computers • Familiarity with parts of computer • Understand the input and output devices. • Basic ideas of internal and external storage devices, microprocessors, motherboards, SMPS, BIOS, and the basic Hardware components used in Computer Networks. //	Unit-1 : Evolution & Classification of Modern computer, and Personal Computer hardware	Remember, Understand, Analysis, Evaluate
	Unit-2 : Hard Disk Drive, File system, and Hard disk Tools	Remember, Understand, Analysis, Evaluate
	Unit-3 : Optical Media and their Technologies	Remember, Understand, Analysis, Evaluate
	Unit-4 : Internal Computer Hardware (including Processor, Motherboard, Sockets, Slots, Power/Peripheral/Pin connectors, RAM)	Remember, Understand, Analysis, Evaluate
	Unit-5 : SMPS, BIOS, Network Interface Card, Network cabling, I/O Box, Switches, RJ 45 connectors, Patch panel/cord, racks, IP address.	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Computer Based Accounting and Financial Management
Paper Code : BCA-HG-1016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps students to learn principles and concepts of accountancy • Understand basic concepts of Accounting. • Knowledge regarding how to create ledgers, journals and balance sheet.	Unit-1: Accounting	Remember, Understand, Analysis, Evaluate
	Unit-2: Tally	Remember, Understand, Analysis, Evaluate
	Unit-3: Advanced Accounting	Remember, Understand, Analysis, Evaluate

2nd Semester BCA (Honours)

CORE COURSE

Paper Name : Mathematics –I
Paper Code : BCA-HC-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps to increase Students mathematical abilities. • Reason mathematically about basic discrete structures such as Determinants and Matrices. • Intuitive idea about Limits and	Unit-1: Determinants and Matrices	Remember, Understand, Analysis, Evaluate
	Unit-2: Complex Numbers	Remember, Understand, Analysis, Evaluate
	Unit-3: Limits and Derivatives	Remember, Understand, Analysis, Evaluate

Derivatives • Familiarity with Calculus. //	Unit-4: Calculus	Remember, Understand, Analysis, Evaluate

Paper Name : Digital Logic Fundamentals

Paper Code : BCA-HC-2026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On completion of this course, students will understand : • Digital circuits, • The concept of various components to design stable analog, sequential, combinational circuits • Microprocessor architecture, • Interfacing of various components. //	Unit-1: Boolean Algebra and Logic Gates	Remember, Understand, Analysis, Evaluate
	Unit-2: Combinational Circuit	Remember, Understand, Analysis, Evaluate
	Unit-3: Sequential Circuit	Remember, Understand, Analysis, Evaluate
	Unit-4: Counters	Remember, Understand, Analysis, Evaluate
	Unit-5: Registers	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Basic Electronics

Paper Code : BCA-HG-2016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On completion of this course, students will able to: • Identify the unique vocabulary associated with electronics and explain the basic concepts of Semiconductor diodes such as P-N junction diode, Zener diode. • To apply the basics of diode to describe the working of rectifier circuits such as Full and half wave rectifiers. • Identify and explain the various current components in a transistor. //	Unit-1: Circuit Concepts and Circuit Analysis	Remember, Understand, Analysis, Evaluate
	Unit-2: Analog Electronics	Remember, Understand, Analysis, Evaluate
	Unit-3: Digital Electronics	Remember, Understand, Analysis, Evaluate

3rd Semester BCA (Honours)

CORE COURSE

Paper Name : Software Engineering

Paper Code : BCA-HC-3016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this subject the students have the basic skill in the application of engineering discipline to the creation of software. A software engineer is responsible for developing and/or implementing the new features to improve the existing programs and software.	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Software Project Planning	Remember, Understand, Analysis, Evaluate
	Unit-3: Software Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Software Testing and Maintenance	Remember, Understand, Analysis, Evaluate

Paper Name : Data Structure and Algorithms

Paper Code : BCA-HC-3026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Students will be able to implement linear and non-linear data structure, determine and analyze the complexity of give algorithm • Know about the basic concepts of Function, Recursion, Array and Link-list. • Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees, various Sorting algorithms and Hashing. //	Unit-1: Definition	Remember, Understand, Analysis, Evaluate
	Unit-2: Linked Structure	Remember, Understand, Analysis, Evaluate
	Unit-3: Stacks and Queues	Remember, Understand, Analysis, Evaluate
	Unit-4: Binary Trees	Remember, Understand, Analysis, Evaluate
	Unit-5: Searching	Remember, Understand, Analysis, Evaluate
	Unit-6: Sorting	Remember, Understand, Analysis, Evaluate
	Unit-7: Analysis of Algorithm	Remember, Understand, Analysis, Evaluate

Paper Name : Database Management System

Paper Code : BCA-HC-3036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
To acquaint practical knowledge about creating and manipulating data in the Database. Student gets the knowledge create and populate a RDBMS for a real life applications with constrains and keys, using SQL. Students gain a good understanding of the architecture and functioning of	Unit-1: File Structure	Remember, Understand, Analysis, Evaluate
	Unit-2: Overview of Database Management System	Remember, Understand, Analysis, Evaluate
	Unit-3: Relational Models	Remember, Understand, Analysis, Evaluate

database management systems as well as associated tools and techniques, principles of data modeling using entity relationship and develop a good database design and normalization techniques to normalize a database. //	Unit-4: Database Design	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : Web Technology

Paper Code : BCA-SE-3014

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• Helps students to inculcate knowledge in two domains : ➢ Web Technological concepts and ➢ Functioning of the Internet. • It also Helps to Implement interactive Web Pages using HTML, Java-Script (Client-side programming), and protocols in the workings of the web and web applications. //	Unit-1: Overview of the World Wide Web and the internet	Remember, Understand, Analysis, Evaluate
	Unit-2: Inside the firewall AND Linking database to the Web	Remember, Understand, Analysis, Evaluate
	Unit-3: HTML editors and tools	Remember, Understand, Analysis, Evaluate
	Unit-4: Java Script	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Introduction to Indian History

Paper Code : BCA-HG-3016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
At the end of the course the students will be able to learn : • To realize the past glory of mother land. • To appreciate the values of the life of the earlier people • To impart knowledge on the Indian Heritage. • To understand recent trends in history. • To train the students to face the competitive examinations. //	Unit-1: Indus Valley Civilization, Vedic period, Maurya dynasty and Asoka's administration	Remember, Understand, Analysis, Evaluate
	Unit-2: Gupta Period: Samudragupta, Chandragupta II,	Remember, Understand, Analysis, Evaluate
	Unit-3: Muslim rule in India:, Rise of Mughal power in India,	Remember, Understand, Analysis, Evaluate
	Unit-4: Arrival of Europeans, British power after Battle of	Remember, Understand, Analysis, Evaluate
	Unit-5: Birth of Indian National Congress and Swadeshi Movement, Quit India Movement and independence	Remember, Understand, Analysis, Evaluate

4th Semester BCA (Honours)

CORE COURSE

Paper Name : Computer Organization and Architecture

Paper Code : BCA-HC-4016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On successful completion of this course, the students will be able to Master the following : • Understand the fundamentals of different instruction set architectures and their relationship to the CPU design. • Organization of the Input and Output. • Organization of Memory Subsystem including the Primary and Secondary storage System. //	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Register Transfer Logic	Remember, Understand, Analysis, Evaluate
	Unit-3: Processor Logic Design	Remember, Understand, Analysis, Evaluate
	Unit-4: Control Logic Design	Remember, Understand, Analysis, Evaluate
	Unit-5: I/O Subsystem	Remember, Understand, Analysis, Evaluate
	Unit-6: Memory Subsystem	Remember, Understand, Analysis, Evaluate

Paper Name : Mathematics-II

Paper Code : BCA-HC-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Helps to increase Students mathematical abilities that are commonly used in computer science. In particular Students will learn to : • Reason mathematically about Sets, Relations and Functions • Intuitive idea about Graph Theory and Matrices • Idea about Mathematical Logic • Familiarity with Vector Space. //	Unit-1: Sets, Relations and Functions	Remember, Understand, Analysis, Evaluate
	Unit-2: Graph theory	Remember, Understand, Analysis, Evaluate
	Unit-3: Combinatorics	Remember, Understand, Analysis, Evaluate
	Unit-4: Matrices	Remember, Understand, Analysis, Evaluate
	Unit-5: Logic	Remember, Understand, Analysis, Evaluate
	Unit-6: Vector Space	Remember, Understand, Analysis, Evaluate

Paper Name : Object Oriented Programming in C++

Paper Code : BCA-HC-4036

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper helps students to inculcate knowledge on Object Oriented Programming concepts (OOPs) using C++ by understand fundamentals and basic concepts of object oriented programming concepts includes	Unit-1: Introduction to object oriented programming	Remember, Understand, Analysis, Evaluate
	Unit-2: Classes and objects	Remember, Understand, Analysis, Evaluate
	Unit-3: Function and operator overloading	Remember, Understand, Analysis, Evaluate

classes, objects, Functions, Operator overloading, inheritance, Streams, and File handling mechanism. //	Unit-4: Inheritance	Remember, Understand, Analysis, Evaluate
	Unit-5: Streams	Remember, Understand, Analysis, Evaluate
	Unit-6: Files	Remember, Understand, Analysis, Evaluate

SKILL ENHANCEMENT COURSE (SEC)

Paper Name : Advanced Web Technology

Paper Code : BCA-SE-4034

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• Helps students to inculcate knowledge of Web Development Techniques in two most popular Server Side Scripting methods : ➢ PHP (Hypertext Preprocessor) ➢ JSP (Java Server Page) • It also Helps students to get an overview of the Current Trends in Web Technology. //	Unit-1: Web Development Techniques • Server Side Scripting with PHP • Server Side Scripting with JSP • Intermediate Web Development Techniques	Remember, Understand, Analysis, Evaluate
	Unit-2: Current Trends in Web Technology	Remember, Understand, Analysis, Evaluate

GENERIC ELECTIVE (GE)

Paper Name : Information Security and Cyber Laws

Paper Code : BCA-HG-4026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• The course will cover the basics of information security & spread awareness of this field to help the Students to understand the importance of security in their daily lives in the IT field. • Students could maintain an appropriate level of awareness, knowledge and skill on the disciplines of technology, business and law to allow them to minimize the occurrence and severity of information security incidents. • The course bear a strong adherence to computer based technological skills and capabilities, and thereby resulting in efficiency to handle a variety of issues related to Information and Cyber Security in any organization. //	Unit-1: Course Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Digital Crime	Remember, Understand, Analysis, Evaluate
	Unit-3: Information Gathering Techniques	Remember, Understand, Analysis, Evaluate
	Unit-4: Risk Analysis and Threat	Remember, Understand, Analysis, Evaluate
	Unit-5: Introduction to Cryptography and Applications	Remember, Understand, Analysis, Evaluate
	Unit-6: Safety Tools and Issues	Remember, Understand, Analysis, Evaluate
	Unit-7: Cyber laws to be covered as per IT 2008	Remember, Understand, Analysis, Evaluate

5th Semester BCA (Honours)

CORE COURSE

Paper Name : Java Programming

Paper Code : BCA-HC-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper inculcate knowledge on Java Programming concepts, Programming logic that enables the students to create wide range of Applications using Java by understanding Object Oriented Programming in Java, including defining methods, using class libraries, etc. On successful completion of the course the students should have acquired skill in advanced java programming concepts like Exception Handling. //	Unit-1: JAVA language basics	Remember, Understand, Analysis, Evaluate
	Unit-2: Operators and Control Statements	Remember, Understand, Analysis, Evaluate
	Unit-3: Classes and Methods	Remember, Understand, Analysis, Evaluate
	Unit-4: Inheritance	Remember, Understand, Analysis, Evaluate
	Unit-5: Exception handling	Remember, Understand, Analysis, Evaluate

Paper Name : Operating System

Paper Code : BCA-HC-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
Enable student to get sufficient knowledge about the role of Operating System in their management policies and understand the process management policies. • To make students able to learn different types of operating systems along with concept of file systems, Directory structure and CPU scheduling algorithms used in operating system. • To provide students knowledge of Process management, Memory management, I/O management and deadlock handling algorithms. • At the end of the course, students will be able to implement various algorithms required for management, scheduling, allocation and communication used in Operating System. //	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Processes	Remember, Understand, Analysis, Evaluate
	Unit-3: Process Synchronization	Remember, Understand, Analysis, Evaluate
	Unit-4: Scheduling	Remember, Understand, Analysis, Evaluate
	Unit-5: Deadlocks	Remember, Understand, Analysis, Evaluate
	Unit-6: Memory management	Remember, Understand, Analysis, Evaluate
	Unit-7: File system	Remember, Understand, Analysis, Evaluate
	Unit-8: I/O management	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Project Work / Dissertation (Credit: 6)

Paper Code : BCA-HE-5016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
At the end of this course student will: • Students should be able to design and construct a hardware and software system, component, or process to meet desired needs. • Students are provided to work on multidisciplinary Problems. • c) 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 //	• No Units Specified in this Paper ***Guidelines*** : • The students will be allowed to work on any project based on the concepts studied in core / elective or skill based elective courses. • The group size should be maximum of three (03) students. Each group will be assigned a teacher as a supervisor who will handle both their theory as well lab classes. • A maximum of Four (04) projects would be assigned to one teacher.	Remember, Understand, Analysis, Evaluate

Paper Name : Data Mining & Warehousing

Paper Code : BCA-HE-5026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
On Successful completion of the course the students will learn the following : • To identify the scope and essentiality of Data Warehousing and Mining. • Design data warehouse with dimensional modelling and apply OLAP operations. • Understand Data Warehouse fundamentals, Data Mining Principles • Identify appropriate data mining algorithms to solve real world problems • Compare and evaluate different data mining techniques like classification, prediction, clustering and association rule mining • To analyze data, choose relevant models and algorithms for respective applications. • To develop research interest towards advances in data mining. • Benefit the user experiences towards research and innovation/integration. //	Unit-1: Introduction to Data Warehousing	Remember, Understand, Analysis, Evaluate
	Unit-2: Introduction to Data Mining Introduction	Remember, Understand, Analysis, Evaluate
	Unit-3: Clustering	Remember, Understand, Analysis, Evaluate
	Unit-4: Rule Mining	Remember, Understand, Analysis, Evaluate
	Unit-5: Classification	Remember, Understand, Analysis, Evaluate

6th Semester BCA (Honours)

CORE COURSE

Paper Name : System Administration using Linux

Paper Code : BCA-HC-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• Students will be able to understand the basic commands of Linux operating system • Understand basics of various OS related concepts, from programmer's point of view, like files, directories, kernel, i-nodes, APIs, system calls, processes, signals, etc. • Able to write useful shell scripts for solving problems. Shell scripts will greatly and effectively enhance the usefulness of computers, from the point of view of programmers and application developers. • Use basic fundamental utilities which are required again and again on daily basis to work on a modern operating system. • To develop the skills necessary for systems programming and network programs using sockets • Learn Hands-on Practical / Lab work to be performed Based on Linux. //	Unit-1: Introduction	Remember, Understand, Analysis, Evaluate
	Unit-2: Linux file system	Remember, Understand, Analysis, Evaluate
	Unit-3: Basic Linux Commands	Remember, Understand, Analysis, Evaluate
	Unit-4: Process Creation	Remember, Understand, Analysis, Evaluate
	Unit-5: General User Administration	Remember, Understand, Analysis, Evaluate
	Unit-6: Networking in Linux	Remember, Understand, Analysis, Evaluate

Paper Name : Computer Networks

Paper Code : BCA-HC-6026

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This paper helps students to inculcate knowledge on the basic concepts of Computer Networks :- • Help to get the knowledge on Networking concepts and the underlying technologies used for data communication media. • To role of protocols in networking and to analyze the services and features of the various layers in the protocol stack. • To understand the working various internetworking. • Overview of the Application Layer protocols visible by the user. • To understand the ever crucial Network Security issues	Unit-1: Physical Layer	Remember, Understand, Analysis, Evaluate
	Unit-2: Digital Transmission	Remember, Understand, Analysis, Evaluate
	Unit-3: Data Link Layer	Remember, Understand, Analysis, Evaluate
	Unit-4: Network Layer	Remember, Understand, Analysis, Evaluate
	Unit-5: Transport Layer	Remember, Understand, Analysis, Evaluate
	Unit-6: Application layer & Network Security	Remember, Understand, Analysis, Evaluate

DISCIPLINE SPECIFIC ELECTIVES (DSE)

Paper Name : Automata Theory and Languages

Paper Code : BCA-HE-6016

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
This course focuses on the basic theory of Computer Science and formal methods of computation like automata theory, formal languages, grammars, finite automata and push down automata The student will be able to: • Understand the basic properties of formal languages and grammars. • Differentiate regular, context-free and recursively enumerable languages. • Make grammars to produce strings from a specific language. • Acquire concepts relating to the theory of computation and computational models including decidability and intractability.//	Unit-1: Finite Automata	Remember, Understand, Analysis, Evaluate
	Unit-2: Regular Languages and Regular Grammar	Remember, Understand, Analysis, Evaluate
	Unit-3: Properties of Regular Languages	Remember, Understand, Analysis, Evaluate
	Unit-4: Context Free languages	Remember, Understand, Analysis, Evaluate
	Unit-5: Pushdown Automata	Remember, Understand, Analysis, Evaluate

Paper Name : Microprocessor and Assembly Language Programming

Paper Code : BCA-HE-6056

Course Outcome	Unit / Topic	Bloom's Taxonomy Level
• A thorough understanding of the Intel 8085 microprocessor demands concepts and skills from two different disciplines : ➢ Hardware concepts from *Electronics* and ➢ Programming skills from *Computer Science*. Introduction to the basic Architecture, Instruction sets and the Assembly Language Programming of the Intel 8085 microprocessor Kit. //	Unit- 1: Internal Organization of 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 2: 8085A microprocessor architecture	Remember, Understand, Analysis, Evaluate
	Unit- 3: Assembly language programming in 8085A microprocessor	Remember, Understand, Analysis, Evaluate
	Unit- 4: Interfacing	Remember, Understand, Analysis, Evaluate
	Unit- 5: Interrupt	Remember, Understand, Analysis, Evaluate

---------- ● ----------