



ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

COURSE STRUCTURE AND SYLLABUS

BACHELOR OF COMPUTER APPLICATION (BCA) PROGRAMME

BCA 2ND SEMESTER SYLLABUS STRUCTURE

Sl.No.	Subject Code	Subject Name	L	T	P	C
Theory Subjects						
1	BCA171201	Data Structure and Algorithm	3	2	0	4
2	BCA171202	Mathematics II	3	2	0	4
3	BCA171203	Digital Logic	3	2	0	4
4	BCA171204	Accounting and Financial Management	3	2	0	4
Practical Subjects						
5	BCA171215	Laboratory II (C++Programming)	0	0	10	5
TOTAL			12	8	10	21
Total Contact Hrs: 30; Total Credits:21						

Paper	BCA171201		
Subject Name	Data Structure and Algorithm		
Marks	Theory- 70 , Internal Evaluation:30		
Pre-requisite	Nil		
UNIT		Content	Weeks
1		Introduction to Data Structure : Linear and Non Linear Data structure	1
2		Linear Data Structure Array(one and two dimension),Application of Array, Linked list(singly, double and circular) and its application Stack ,Queue and its application.	4
3		Non linear Data structure Binary tree, Binary search Tree, properties of binary tree and its types, Tree traversal methods	3
4		Graph algorithms Graph ,DFS and BFS, Graph representation in memory, Spanning tree, Kruskal and Prim's Algorithm	4
5		Algorithm Concepts and sorting and searching techniques Analysis of Algorithm: Time and Space complexity of algorithms, average case,best case and worst case analysis Sorting and Searching algorithm such as Selection sort, Insertion-sort, Bubble-sort, Binary search, Linear search.	3
Books	1	Classic Data Strcure : By D Samanta	
	2	Data Structure Through C++ By Y Kanetkar	
	3	Weiss, Data Structures and Algorithm Analysis in C++, Pearson Education	

Paper		BCA171202	
Subject Name		Mathematics II	
Marks		Theory- 70 , Internal Evaluation: 30	
Pre-requisite		Nil	
Unit		Content	Weeks
1		Sets, relations and functions Definition and representation of sets, cardinality of sets, elementary set operations- union, intersection, difference, Cartesian product, concept of universal set and complementation, Venn diagram, De Morgan's Law, simple properties of set operations. Relations, properties of binary relation-reflexive, symmetric, and transitive, equivalence relations, equivalence classes and partitions. Functions, one-to-one and onto function, composition of functions, invertible functions, Principle of mathematical induction.	4
2		Combinatorics and recurrence relations Permutations, Combinations, permutations with repetitions, combinations with repetitions, recurrence relations and their solutions.	3
3		Sequence and Series Sequence, Arithmetic Progression and Geometric Progression, general term, A.M. (Arithmetic Mean), G.M.(Geometric Mean). Relation between A.M and G.M. Sum of AP and GP series, Sum to n terms of special series. Sequence of real numbers, bounded, convergent and divergent sequence, uniqueness of the limit and bounds of convergent sequence. Infinite series, exponential and logarithmic series.	4
4		Basic of Graph Theory: Various types of graphs, paths and cycles, directed and undirected graphs, Hand Shaking Theorem, Eulerian and Hamiltonian graphs, Graph connectivity, graph traversals, Isomorphism of graphs, Subgraphs, Complement of graph,, matrix representation of graphs. Trees: Properties of trees, rooted trees. Distance and centres in trees.	4

	Books	1. Tremblay, J.P, Manohar, R. Discrete Mathematical Structures with Application to Computer Science.	
		2. Discrete Mathematics, N. Ch. SN Iyenger, K.A. Venkatesh, V.M. Chandrasekaran, P.S. Arunachalam, Vikash Publishing House Pvt. Ltd.	
		3. Graph Theory By Narsingha Deo	

Paper		BCA171203	
Subject Name		Digital Logic	
Marks		Theory – 70 , Internal Evaluation - 30	
Pre-requisite		BCA171101	
Unit	PARA	Content	Weeks
1		Representation of information: Number system, Idea about number representation, Decimal, binary, octal, hexadecimal number system and their arithmetic. Representation of negative numbers.	1
2		Boolean Algebra and logic gates: Axiomatic definition of Boolean algebra, Rules (postulates and basic theorems) of Boolean algebra, dual and complement of Boolean expression, Canonical form and Standard form, Sum of product and product of sum form, Conversion between Boolean expression and truth table, Karnaugh map method (upto four variable k-map), Don't care condition, Different types of gates, Implementation of logic expression with logic gates.	5
2		Combinational Circuit : Adder: half adder, full adder, Subtractor: half subtractor and full subtractor, Magnitude comparator, Decoder, Encoder, Application examples of decoder and encoder, Multiplexer, Demultiplexer, Application examples of multiplexer and Demultiplexer.	4
3		Sequential Circuit: Simple RS flip-flop or latch, Clocked RS flip-flop, D flip-flop, JK flip-flop, T flip-flop, Analysis of Clocked Sequential circuits, State Reduction and Assignment, Flip –Flop Excitation tables, Design Procedure for sequential circuits.	4
4		Registers and counters : Introduction to registers and counters. Types of registers and counters , Use of registers and counters.	1
	Books	1.M. M. Mano, <i>Digital Logic and Computer Design</i> , PHI, 1994 C.	
		2. Bartee, <i>Computer Architecture and Logic Design</i> , McGraw Hill, 1991	

Paper	BCA171204	
Subject Name	Accounting and Financial Management	
Marks	Theory- 70 , Internal Evaluation:30	
Pre-requisite	Nil	
Unit No.	Contents	weeks
1.	Introduction to Accounting, GAAP and Accounting Standards Introduction; Meaning of Accounting, Users of Accounting Information; Objectives of Accounting; Advantages & Limitations of Accounting; Qualitative Characteristics of Financial Statements; Branches of Accounting; Basic Accounting Terminology; Double Entry System of Book Keeping. Meaning of Generally Accepted Accounting Principles (GAAP); Basic Assumptions, Basic Principles & Modifying Principles of Accounting.	4
2.	Journalizing, Posting, Balancing and preparation of a Trial Balance Classification of Accounts – Traditional & Modern Approach, Rules for Debit and Credit, Journalising – Simple and compound, Posting of journal into the ledgers.	4
3.	Cash Book and Depreciation Cash Book: Meaning and Types of Cash Book- Single Column, Cash Book with Discount Column, Preparation of Cash Book with Cash, Bank and Discount Column. Depreciation: Meaning of Depreciation and Depreciation Accounting; Causes of Depreciation; Factors Affecting the Amount of Depreciation; Methods of Allocating Depreciation- SLM and WDV Method.	4
4.	Ratio Analysis Meaning of Ratio and Ratio Analysis, Classification of various Accounting Ratios, Advantages and limitations of Ratio Analysis, Computation of Liquidity, Activity and Profitability Ratios.	3
Books	1. P.C.Tulsian - Financial Accounting (Pearson Education) 2. Accountancy – B. B. DAM, Capital Publishing House. 3. Cost and Management Accounting (Theory and Problems) – M.N. Arora, Himalaya Publishing House.	

Paper	BCA171215		
Subject Name	Laboratory II (C++ Programming)		
Marks	Practical- 70 , Internal Evaluation:30		
Pre-requisite	BCA171201		
UNIT		Content	Weeks
1		Concept of Object oriented programming in C++	3
2		Array ,Linked list ,stack ,queue implementation using C++	4
3		Binary search Tree implementation	2
4		DFS and BFS implementation	2
5		Sorting Algorithm: Bubble, Insertion and Selection Sort	2
6		Searching: Linear Search and Binary Search.	2
Books		1.Classic Data Strcure : By D Samanta	
		2. Object oriented Programming with Ansi & Turbo C++ By A. Kamthane	
