Bachelor of Computer Application			
Programme/Class:		**Year:** 1st	**Semester:** 2nd
Subject Code: BCA-102 N	**Subject Title:** Data Structures using C		
Course out comes:	On completion of the course, the student will be able to:		
CO 1:	Understand concepts such as Data Organizations, Need of Data Structures, Types of Data Structure, Algorithm Complexity, and Time-Space trade-off.		
CO 2:	Study linear data structures such as stacks and queues and understand their difference		
CO 3:	Study different techniques for solving problems like sorting and searching		
Credits: 4		**Core Compulsory**	
Max. Marks: 30 + 70		**Min. Passing Marks: 40**	

Tot al No. of Lectures-Tutorials-Practical(in hours per week): 4-0-0

Unit	Topic	No. of Lectures
I	Introduction to Data Structures: Basic Terminology, Elementary Data Organizations, Classification of data structures and its operations. Arrays: Representation of single and multidimensional arrays (up to three dimensions) ; sparse arrays - lower and upper triangular matrices and Tri-diagonal matrices; addition and subtraction of two sparse arrays. (Multidimensional, and, sparse arrays, to be given elementary treatment.)	10
II	Sorting Techniques: Insertion sort, selection sort and merge sort. Searching Techniques: linear search, binary search and hashing.	10
III	Stacks and Queues: Introduction and primitive operations on stack; Stack application: Polish Notations; Evaluation of postfix expression; Conversion from infix to postfix; Introduction and primitive operations on queues; D-queues and priority queues.	10
IV	Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion, searching, Two way lists and Use of headers Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion and deletion;	10
V	Introduction to and creation of AVL trees and m-way search trees - (elementary treatment to be given); Multilevel indexing and B-Trees: Introduction; Indexing with binary search trees; Multilevel indexing, a better approach to tree indexes; Example for creating a B-tree.	10

Suggested Readings:

- Yashavant Kanetkar, Data Structure through ‘C’, BPB Publications.
- S. Chottopadhyay, D. Ghoshdastidar and M.Chottopadhyay, Data Structure through C Language, BPB Publications.

Suggested equivalent online courses:

https://nptel.ac.in/courses/106102064

This course can be opted as an elective by the students of following subjects: NONE			
Suggested Continuous Evaluation Methods: Continuous Internal Evaluations hall be based on allotted Assignment and Class Tests. The marks shall			
	Internal Assessment	**Marks**	
	Class Interaction	5	
	Quiz/Assignments	5	
	Seminar/Presentation	5	
	Unit Test/Class Test	15	
	Total	30	

Bachelor of Computer Application			
Programme/Class:		**Year:**1st	**Semester:**2 nd
Subject Code: BCA-104 N	**Subject Title:** Introduction to Database System		
Course out comes:	On completion of the course, the student will be able to:		
CO 1:	Understand terms related to database design and management.		
CO 2:	Assess various database models.		
CO 3:	Evaluate the normality of a logical data model, and correct any anomalies		
CO4:	Implement relational databases using MySQL.		
Credits:4		**Core Compulsory**	
Max. Marks: 30 + 70		**Min. Passing Marks: 40**	

Tot al No. of Lectures-Tutorials-Practical(in hours per week): 4-0-0

Unit	Topic	No. of Lectures
I	Database: Introduction to database, relational data model, DBMS architecture, data independence, DBA, database users, end users, front end tools	10
II	E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, E- R diagrams, database design using ER diagrams, and Suitable Examples for Practice.	10
III	Relational Data Model: Relational model concepts, relational constraints, primary and foreign key, Functional Dependency, Properties and Types of Functional Dependency, normalization: 1NF, 2NF, 3NF and Suitable Examples for Practice.	10
IV	Structured Query Language: Types of SQL statements, syntax for different SQL query statements, create a database table, create relationships between database tables, modify and manage tables, queries, forms, reports, modify, filter and view data, and Suitable Examples for Practice.	10
V	Database Security, Integrity and Control: Security and Integrity threats, Defense mechanism, Integrity, Recent trends in DBMS, Distributed and Deductive databases.	10

Suggested Readings:

- Abraham Silberschatz, Henry F. Korth, S. Sudarshan, Database System Concepts McGraw Hill Education India Private Limited
- C.J. date, An introduction to Database Systems, Addison Wesley Longman Inc.
- R. Elmsasri, S. Navathe, Fundamentals of Database Systems, Pearson Education.
- MySQL : Reference Manual

Suggested equivalent online courses:

https://nptel.ac.in/courses/106104135

This course can be opted as an elective by the students of following subjects: NONE

Suggested Continuous Evaluation Methods:

Continuous Internal Evaluations hall be based on allotted Assignment and Class Tests. The marks shall

	Internal Assessment	**Marks**	
	Class Interaction	5	
	Quiz/Assignments	5	
	Seminar/Presentation	5	
	Unit Test/Class Test	15	
	Total	30	

Bachelor of Computer Application			
Programme/Class:		**Year:** 1st	**Semester:** 2nd
Subject Code: BCA-106 N	**Subject Title:** Business Organization & Management		
Course out comes:	On completion of the course, the student will be able to:		
CO 1:	Foundations of Business and Management		
CO 2:	Gain knowledge of various forms of business organizations		
CO 3:	Comprehend the concept of organizational structure		
CO4:	Understand the concept of coordination		
Credits: 4		**Core Compulsory**	
Max. Marks: 30 + 70		**Min. Passing Marks: 40**	

Tot al No. of Lectures-Tutorials-Practical(in hours per week): 4-0-0

Unit	**Topic**	**No. of Lectures**
I	Concepts: Business, trade, industry and commerce – Business: Features of business- Trade: Classification, Aids to trade – Industry: Classification – Commerce – Relationship between trade industry and commerce – Functions of Business. Forms of Business Organization Sole Proprietorship: meaning – characteristics –Advantages &disadvantages Partnership - -Meaning – Characteristics – Kinds of Partners – Registration of Partnership – Partnership Deed – Limited liability Partnership (LLP)	10

II	Definition – Management an Art, Science or Profession – Manager Defined – Manager vs Leader - Levels of Management – Skills of Management. Management Thought: Contributions of Henry Fayol (14 principles) – F. W. Taylor's Scientific Management – Max Weber's theory of Bureaucracy	10
III	Planning: Definition - Importance - Steps in planning – limitations - Types of Plans Decision making: Definition – Process – types of decisions: – Programmed and non-programmed decisions – Strategic and routine decisions- major and minor decisions – Individual and group decisions.	10
IV	Meaning – Organization Structure – Organization chart – Formal and informal Organization – Span of Management – Factors determining Span of Management – Line and Staff concepts. Elements of Organization: Delegation of authority: Meaning – advantages and disadvantages Decentralization : Meaning – advantages and disadvantages	10
V	Motivation: Definition – Meaning-Types-Theories of motivation: The Need Hierarchy Theory – Hygiene approach to motivation Leadership: Definition - Leadership styles: Autocratic, Democratic, Free Reign – Managerial Grid. Coordination- Definition –need -Difficulties-Effectiveness-Definition –Control process Control -Definition –Control process-Essential of good control systemmerits and demerits	10

Suggested Readings:

- Y.K. Bhushan, Business organization and management, Sultan Chand publisher.
- R.K. Sharma and Shashi k Gupta, Industrial Organization and Management, Kalyani Publications

Suggested equivalent online courses:

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This course can be opted as an elective by the students of following subjects: NONE

Suggested Continuous Evaluation Methods:

Continuous Internal Evaluations hall be based on allotted Assignment and Class Tests. The marks shall

	Internal Assessment	**Marks**	
	Class Interaction	5	
	Quiz/Assignments	5	
	Seminar/Presentation	5	
	Unit Test/Class Test	15	
	Total	30	

Bachelor of Computer Application			
Programme/Class:		**Year:** 1st	**Semester:** 2nd
Subject Code: BCA-108 N	**Subject Title:** Digital Electronics		
Course out comes:	On completion of the course, the student will be able to:		
CO 1:	Understand Digital Computer and Digital Systems.		
CO 2:	Understand the logic and applications of Boolean algebra and logic gates.		

CO 3:	Understand the concept of Combinational circuits, Sequential circuits and memory

Credits:4	**Core Compulsory**
Max. Marks: 30 + 70	**Min. Passing Marks: 40**

Tot al No. of Lectures-Tutorials-Practical(in hours per week): 4-0-0

Unit	Topic	No. of Lectures
I	Boolean Algebra Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps. Logic gates NOT , AND, OR, Universal gates- NAND , NOR. EX-OR and EX-NOR gates.	10
II	Review of various number systems (Binary, Octal, Hexadecimal), Definition of BCD , Gray codes and Excess – 3 codes and their application	10
III	Arithmetic Circuits Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and divider. Combinational Circuits Multiplexers, De-Multiplexers, decoders, encoders	10
IV	Flip-flops S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop, Realization of one flip-flop using other flip-flop. Shift Registers Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register.	10
V	Counters Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter. Memory Devices - RAM, ROM, PAL & PLA	10

Suggested Readings:

- Morris Mano, "Digital Logic and Computer Design", PHI Publications. ● Raj Kamal, "Digital Systems", Principles and Design, Pearson.
- R. P. Jain, "Modern Digital Electronics", TMH, 3rd Edition.

Suggested equivalent online courses:

This course can be opted as an elective by the students of following subjects: NONE

Suggested Continuous Evaluation Methods:

Continuous Internal Evaluations hall be based on allotted Assignment and Class Tests. The marks shall

	Internal Assessment	Marks	
	Class Interaction	5	
	Quiz/Assignments	5	
	Seminar/Presentation	5	
	Unit Test/Class Test	15	
	Total	30	

	Class Interaction	5	
	Quiz/Assignments	5	
	Seminar/Presentation	5	
	Unit Test/Class Test	15	
	Total	30	