

BENGALURU CENTRAL UNIVERSITY
BACHELOR OF COMPUTER APPLICATIONS,
SYLLABUS (2019-20 ONWARDS)

Title of Papers and Scheme of Study & Examination for BCA, Under Choice Based Credit
System - Semester System (Revised w.e.f. 2019-2020)

Sem	Part	Paper Code	Title of Paper	Hours/Week	Marks			Credits	
					IA	Exam	Total	Subject	Semester
I	Part 1	BCA 101T	Indian Language	4	30	70	100	2	16
		BCA 102T	English	4	30	70	100	2	
	Part 2	BCA 103T	Problem Solving Techniques using C	4	30	70	100	2	
		BCA 104T	Computer Organizations	4	30	70	100	2	
		BCA 105T	Discrete Mathematics	5	50	100	150	3	
		BCA 103P	C Programming Lab	3	15	35	50	1	
		BCA 104P	Office Automation	3	15	35	50	1	
	Part 3		Foundation Course	3	30	70	100	2	
			CC & EC		50		50	1	
II	Part 1	BCA20 1T	Indian Language	4	30	70	100	2	16
		BCA20 2T	English	4	30	70	100	2	
	Part 2	BCA20 3T	Data Structures	4	30	70	100	2	
		BCA20 4T	Database Management System	4	30	70	100	2	
		BCA20 5T	Numerical and Statistical Methods	5	50	100	150	3	
		BCA20 3P	Data Structures using C lab	3	15	35	50	1	
		BCA20 4P	DBMS Lab Using Oracle	3	15	35	50	1	

	Part 3		Foundation Course	3	30	70	100	2	
			CC & EC		50		50	1	
Sem	Part	Paper Code	Title of Paper	Hours/Week	Marks			Credits	
					IA	Exam	Total	Subject	Semester
III	Part 1	BCA301T	Indian Language	4	30	70	100	2	16
		BCA302T	English	4	30	70	100	2	
	Part 2	BCA303T	Object oriented Programming using C++	4	30	70	100	2	
		BCA304T	Financial Accounting and Management	4	30	70	100	2	
		BCA305T	Operating System	5	50	100	150	3	
		BCA303P	OOPS Using C++ Lab	3	15	35	50	1	
		BCA304P	Tally Lab	3	15	35	50	1	
	Part 3		Foundation Course	3	30	70	100	2	
			CC & EC		50		50	1	
IV	Part 1	BCA401T	Indian Language	4	30	70	100	2	16
		BCA402T	English	4	30	70	100	2	
	Part 2	BCA403T	VB.NET Programming	4	30	70	100	2	
		BCA404T	Unix and Shell Programming	4	30	70	100	2	
		BCA405T	Software Engineering	5	50	100	150	3	
		BCA403P	VB.NET Lab	3	15	35	50	1	
		BCA404P	Unix Lab	3	15	35	50	1	
	Part 3		Skill Development	3	30	70	100	2	
		CC & EC		50		50	1		

Sem	Part	Paper Code	Title of Paper	Hours/Week	Marks			Credits	
					IA	Exam	Total	Subject	Semester
V	Part 2	BCA501T	Data Communication and Networks	5	50	100	150	3	20
		BCA502T	Artificial Intelligence	5	50	100	150	3	
		BCA503T	Java Programming	4	30	70	100	2	
		BCA504T	Analysis and Design of Algorithm	4	30	70	100	2	
		BCA505T	Elective 1	5	50	100	150	3	
		BCA503P	Java Programming Lab	3	15	35	50	1	
		BCA504P	Analysis and Design of Algorithm Lab	3	15	35	50	1	
		BCA506P	Project	6	50	100	150	3	
	Part 3		Skill Development Course	3	30	70	100	2	
VI	Part 2	BCA601T	System Programming	5	50	100	150	3	20
		BCA602T	Professional and Business Communication	5	50	100	150	3	
		BCA603T	WEB Programming	4	30	70	100	2	
		BCA604T	Elective 2	5	50	100	150	3	
		BCA605T	WEB Programming Lab	3	15	35	50	1	
		BCA605P	Project Work	12	100	200	300	6	
	Part 3		Skill Development Course	3	30	70	100	2	

SYLLABUS

FIRST SEMESTER

BCA 101T – INDIAN LANGUAGE

Syllabus as per the one prescribed for science courses of Bangalore University

BCA 102T – ENGLISH

Syllabus as per the one prescribed for science courses of Bangalore University

BCA103T: PROBLEM SOLVING TECHNIQUES USING C

Total Teaching Hours: 52

No of Hours / Week: 04

Unit – I

12 Hours

Introduction to Programming Concepts: Software, Classification of Software, Modular Programming, Structured Programming, Algorithms and Flowcharts with examples. Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords, Data types, Variables, Constants, Symbolic Constants, Operators in C, Hierarchy of Operators, Expressions, Type Conversions and Library Functions.

Unit - II

10 Hours

Managing Input and Output Operation: Formatted and Unformatted I/O Functions, Decision making, branching and looping: Decision Making Statements - if Statement, if-else statement, nesting of if-else statements, else-if ladder, switch statement, ?: operator, Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements. Functions: Function Definition, prototyping, types of functions, passing arguments to functions, Nested Functions, Recursive functions.

Unit - III

10 Hours

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays, Multi Dimensional Arrays - Passing arrays to functions. Strings: Declaring and Initializing strings, Operations on strings, Arrays of strings, passing strings to functions. Storage Classes - Automatic, External, Static and Register Variables.

Unit-IV

10 Hours

Structures-Declaring and Initializing, Nested structure, Array of Structure, Passing Structures to functions, Unions, typedef, enum, Bit fields. Pointers – Declarations, Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers and Arrays, Arrays of Pointers, Pointers and Structures. Meaning of static and dynamic memory allocation, Memory allocation functions.

Unit-V**10 Hours**

Files - File modes, File functions, and File operations, Text and Binary files, Command Line arguments. C Preprocessor directives, Macros – Definition, types of Macros, Creating and implementing user defined header files.

TEXT BOOKS

1. E. Balaguruswamy, “Programming In ANSI C”, 4th edition, TMH Publications, 2007
2. Manjunath Aradhya, “ Programming and Data Structures” , Cengage Publications 2017
3. A. K. Sharma, “Computer Fundamentals and Programming in C”, University Press, 2018

REFERENCES BOOKS

1. Ashok N. Kamthane et. al., “Computer Programming and IT”, Pearson Education, 2011
2. Mahapatra, “ Thinking In C ”, PHI Publications, 1998.
3. Yashwant Kanetkar, “Let Us C”, 13th Edition, PHP, 2013

BCA 104T – Computer Organization**Total Teaching Hours: 52****No of Hours / Week : 04**

Unit-I

12 Hours

Digital Logics: Basic logic gates, Universal gates, Combinational circuits-Half adder and full adder, Flip flops-SR-Flip flop, D-flip flop, J-K flip flop, T flip flop. Boolean Algebra: Simplification of expression, K-Map- 2,3 and 4 variables SOP and POS.

Unit-II

10 Hours

Number System: Binary, octal and hexadecimal system, Basic Conversions, Binary addition ,subtraction ,multiplication and division (integers only), Complements-1’s,2’s,9’s and 10’s complements, One’s complement subtraction method, Two’s complement subtraction method, Weighted and Non-Weighted codes. Binary to gray codes, Gray to Binary codes, Excess-3 Codes.

Unit-III

10 Hours

Computer Organization: Instruction format ,Types of basic computer instruction format ,Instruction cycle, Design of basic computer flowchart, Interrupt and its types, Interrupt cycle

Unit-IV

10 Hours

CPU organization: Arithmetic and logic unit(ALU),One,two and three address instruction format ,Data transfer and manipulation instruction, Arithmetic instructions, Logical instructions and shift instructions

Unit-V 10 Hours

Memory Management: Input, output and storage devices, Memory and its types, Direct memory Access, Auxiliary memory, Associative memory and Cache memory

Text Books

1. Floyd, Digital Fundamentals, 8th Edition, Pearson Education
2. Morris Mano, Computer System Architecture, IV th edition, Prentice Hall of India

Reference Books

1. Digital Design, Morris Mano and Michael D.Cilette, Vth edition , Pearson Education
2. William Stallings, Computer Organization and Architecture, Pearson Education

BCA105T: DISCRETE MATHEMATICS

Total Teaching Hours: 65

No of Hours / Week: 05

Unit-I

13 Hrs

Sets, Relations and Functions: Sets, Subsets, Equal Sets, Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, De-mogan's law, Simple Applications. Relations, Properties of Relations, Equivalence Relation, Function: Domain and Range, Onto, Into, One to One, one to many Functions, Composite and Inverse Functions. Mathematical Logic: Proposition and truth values, Logical Connectives and their truth tables, Converse, Inverse and Contrapositive, Tautology and Contradiction, Logical Equivalence – Standard Theorems, Switching Circuits.

Unit-II

13 Hrs

Matrices: Review of fundamentals: Definition of matrix, order, Types of matrices: zero, row, column, square, diagonal, scalar, unit, symmetric, skew-symmetric. Determinant: Value of determinant of order 2x2, 3x3, minors, cofactors, adjoint, inverse of a matrix. Solutions of linear equations: Cramers rule and matrix method involving two and three variables. Eigen values and Eigenvectors: Characteristic equation, characteristic roots, characteristic vectors (without any theorems) only 2x2 order. Cayley Hamilton theorem. (Only statement), verification of Cayley Hamilton theorem (only 2x2 matrices), using the same finding the powers of A (A⁴, A⁵, A⁻¹, A⁻²), Inverse of a Matrix using Cayley-Hamilton theorem.

Unit-III

13 Hrs

Logarithms: Definition of Logarithm, Indices leading to Logarithms and vice versa, Laws of Logarithms with proofs, Problems, Common Logarithm: Characteristic and Mantissa, Use of Logarithmic Tables, Problems. Permutation and Combination: Fundamental Principle of Counting, Factorial n, Permutations: Definition, Examples, Derivation of Formula nPr, Permutation when all the objects are not distinct, Problems, Combinations: Definition, examples, Proving $nCr = nPr / r!$, $nCr = nCn-r$, $nCr + nCr-1 = n+1Cr$, Problems based on above formulae.

Unit-IV**13 Hrs**

Groups: Binary operation, Define of group, properties (only statement), problems (both finite and infinite groups), subgroup, theorems (no proof), problems. Vectors: Definition of vector and scalar, vector addition, dot and cross product, projection of a vector on the other (no geometrical meaning), area of parallelogram, area of a triangle, scalar triple product, volume of parallelepiped, co planarity of three vectors, vector triple product.

Unit-V**13 Hrs**

Analytical Geometry in Two Dimensions: Coordinates, Distance formula, Section Formula, Area of the Triangle formula (no derivation), Locus of point. Straight Line: Slope of a line and angle between two lines, Various forms of equations of lines – Derivation and Problems. Equation of family of lines passing through the point of intersection of two lines, Distance of a point from line (only problems)

Text Books

1. Grewal, B.S.Higher engineering Mathematings, 36th Edition

Reference Books

1. Satyrs S.S, Engineering Mathematics.
2. Peter V.O'Neil. Advanced Engineering Mathematics, 5th Edition

BCA104P – Microsoft Office Automation Lab**Any Ten**

1. Creating the documents with Special effects like underline, bold, different size, different font and different color.
2. Creating Paragraphs Inserting Date & Time, Pictures, Bullets & Numbering , indentation etc. in MS-Word
3. Formatting features of MS-Word.-it includes paper-size, margins, header and footer, page no. and creation of table options.
4. Creation of mail merge for sending the new year wish to your class group .
5. Creating Worksheets in Excel- , Inserting, Deleting, Copying, Moving worksheets in Excel Usage of formulas, Built-in functions in Excel
6. Graph-Plotting facilities in MS Excel
7. Writing conditional expressions (using IF) and Using logical functions (AND, OR, NOT) Using lookup and reference functions (VLOOKUP, HLOOKUP, MATCH, INDEX)
8. Data Validations :Specifying a valid range of values for a cell, Specifying a list of valid values for a cell, Specifying custom validations based on formula for a cell, Sorting and Filtering Data ,Macro facility in MS Excel
9. Creating a presentation in PowerPoint- - Inserting / Deleting slides in PowerPoint
10. Creation of Slide transition and Editing special effects in PowerPoint
11. Creation of Inserting sound and picture in PowerPoint
12. Creation of Inserting chart and organization chart in PowerPoint.

PART – B

During practical examination the External and Internal examiners may prepare exam question paper related to theory syllabus apart from Part-A. (A minimum of 10 Programs has to be prepared).

Note:

- a) The candidate has to write two the programs One from Part-A and other from Part-B and execute one program as of External examiner choice.
- b) A minimum of 10 Programs has to be done in Part-B and has to be maintained in the Practical Record.
- c) Scheme of Evaluation is as follows:

Writing two programs - 10 Marks

Execution of one program - 10 Marks

Formatting the Output - 05 Marks

Viva - 05 Marks

Record - 05 Marks

Total - 35 Marks

BCA 103P-PRACTICALS IN C PROGRAMMING

List of programs:

Part A

Any Ten

1. To design a program and find the roots of the quadratic equations using if-else-if.
2. To design a Menu driven program using switch case and find a)Sum of digits of a number
b) Factorial of N
3. To design a program and find whether a given number is prime or not.
4. To arrange the given numbers in ascending and descending order.
5. To design a program and find product of N*M matrix.
6. To design a program and calculate NCR using functions.
7. To design a program and display Fibonacci series using recursive functions.
8. To design a program and find length of a string without using built in function.
9. To design and implement a program to concatenate two strings using pointers.
10. To design and implement a program to compare two strings using pointers.
11. To design a program to accept details of students such as roll no, name, semester and display them using structures.
12. To design a program to copy content of one file to another file.

PART – B

During practical examination the External and Internal examiners may prepare exam question paper related to theory syllabus apart from Part-A. (A minimum of 10 Programs has to be prepared).

Note:

- a) The candidate has to write two the programs One from Part-A and other from Part-B and execute one program as of External examiner choice.
- b) A minimum of 10 Programs has to be done in Part-B and has to be maintained in the Practical Record.
- c) Scheme of Evaluation is as follows:

Writing two programs - 10 Marks
Execution of one program - 10 Marks
Formatting the Output - 05 Marks
Viva - 05 Marks
Record - 05 Marks
Total - 35 Marks

SECOND SEMESTER

BCA201T: INDIAN LANGUAGE

Syllabus as per the one prescribed for science courses of Bangalore University.

BCA202T: ENGLISH

Syllabus as per the one prescribed for science courses of Bangalore University.

BCA203T: DATA STRUCTURES

Total Teaching Hours: 52

No of Hours / Week: 04

Unit-I

12 Hours

Introduction and Overview: Definition, Elementary data organization, Data Structures, data structures operations, Abstract data types, algorithms complexity, time-space tradeoff. Preliminaries: Mathematical notations and functions, Algorithmic notations, control structures, Complexity of algorithms, asymptotic notations for complexity of algorithms. String Processing: Definition, Storing Stings, String as ADT, String operations, word/text processing, Pattern Matching algorithms

Unit-II

10 Hours

Arrays: Definition, Linear arrays, arrays as ADT, Representation of Linear Arrays in Memory, Traversing Linear arrays, Inserting and deleting, Sorting: Bubble sort, Insertion sort, Selection sort, Searching: Linear Search, Binary search, Multidimensional arrays, Matrices and Sparse matrices.