Bilaspur University, Bilaspur, Chhattisgarh
Syllabus of Bachelor of Computer Application (BCA Yearly System)
w.e.f. academic session 2014-15

SCHEME OF EXAMINATION

&

DETAILED SYLLABUS

For

BACHELOR OF COMPUTER APPLICATIONS (BCA) DEGREE

BILASPUR UNIVERSITY

Bilaspur, Chhattisgarh
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Structure & Syllabi for Three Year Degree Programme of Bachelor of Computer Applications (B.C.A.)

1. The title of the programme will be Bachelor of Computer Application (B.C.A.) and will be introduced from the academic year 2014-15.
2. **Objectives:** The objectives of the Programme shall be to provide sound academic base from which an advanced career in Computer Application can be developed. Conceptual grounding in computer usage as well as its practical software application will be provided.
3. **Eligibility for admission** : In order to be eligible for admission to Bachelor of Computer Applications a candidate must have passed
    a. HSC (10+2) from any stream with English as passing Subject with minimum 40% marks in aggregate.
    b. Three years Diploma Course of Board of Technical Education, conducted by Government of CG or its equivalent.
    c. Three Year Diploma Course (after S.S.C. i.e. 10th Standard), of Board of Technical Education conducted by Government of CG or its equivalent.
4. **Duration**: The duration of the B.C.A. Degree Program shall be three years.
5. **The scheme of Examinations:** The BCA Examination will be of 2400 marks as given Below:
    I) Compulsory papers and Basic Papers: 550 marks
    II) For Theory Papers and Practical Papers: 1850 marks
6. **The Standard of Passing and Award of Class**

    In order to pass in the examination the candidate has to obtain 33% marks out of 100. (Min 33% marks must be obtained in theoretical papers as well as practical papers of University Examination).

    The class will be awarded on the basis of aggregate marks obtained by the candidate for all three years examinations.
7. **RULES OF Promotion**

    As per section 14 of promotion rule.
8. The Medium of Instruction and Examination (Written and Viva) shall be English/Hindi.

9. Instructions to Paper Setters:

a. In each theory paper, six questions are to be set and paper has maximum 100 marks. Question paper should be in English as well as Hindi.

b. Question No. 1 should be compulsory and cover the entire syllabus. This question should have objective or short answer type questions. It should be of 25 marks.

c. Apart from Question No. 1, rest of the paper shall consist of five units as per the syllabus. Every unit should have two questions. However, student may be asked to attempt only 1 question from each unit. Each question should be 15 marks.

10. The Year wise Structure & plan of the programme shall be as follows :

YEAR WISE PLAN

BCA Ist YEAR

Subject Code	Subject Name	Subject Nature	End Year Examination **Maximum Marks**	End Year Examination **Minimum Passing Marks**
BCAYT-101	Discrete Mathematics	Theory	100	33
BCAYT-102	Computer Fundamental and Concepts of Software	Theory	100	33
BCAYT-103	PC Software Packages and Programming in C	Theory	100	33
BCAYT-104	Data Structure	Theory	100	33
BCAYP-105	Software Packages Lab	Practical	75	25
BCAYP-106	Programming lab in C	Practical	75	25
	Total Marks BCA 1st Year Examination		**550**	

BILASPUR UNIVERSITY

Detailed Syllabus
(1st to 3rd Years)
For
Bachelors in Computer Applications
Three Year Degree Course
(BCA)

BCAYT-101
Discrete Mathematics

Unit – I

Recall of statements and logical connectives, tautologies and contradictions, logical equivalence, algebra of propositions quantifiers, existential quantifiers and universal quantifiers.

Unit –II

Boolean algebra and its properties, algebra of propositions as an example, De Morgan's Laws, partial order relations g.l.b., l.u.b. Algebra of electric circuits and its applications. Design of simple automatic control system.

Unit –III

Boolean functions - disjunctive and conjugative normal forms. Boolean's expansion theorem, fundamental forms. Many terminal Networks.

Unit –IV

Arbitrary Cartesian product of sets. Equivalence relations, partition of sets, injective, surjective, bijective maps, binary operations, countable, uncountable sets.

Unit – V

Basic Concept of Graph Theory, Sub graphs, Trees and their properties, Binary Trees, Spanning Trees, Directed Trees, Planar graphs, Euler Circuit, Hamiltonian Graph. Chromatic number.

Text Books:

1. Boolean Algebra and Its Applications, J. Eldon Whitesitt, Addison-Wesley.
2. A Textbook of Discrete Mathematics, Swapan Kumar Sarkar, S. Chand.
3. Discrete Math with Proof, Eric Gossett, Pearson.
4. Discrete Math Workbook: Interactive Exercises, James R Bush, Pearson.

Reference Books:

1. Discrete Mathematics, Prof. H K Pathak, Shiksha Sahitya Prakashan.
2. Discrete Maths, C.L.Liu, T McGraw Hill.

BCAYT-102
Computer Fundamental and Concepts of Software

Unit – I

Basics of Computer

What is Computer?, Introduction to Computing, History of Computers, Application and Issues of Computer, Components of Computer: Input Devices, Output Devices, System Unit, Storage Devices, Communication Devices; Computer Building Blocks: CPU, Hardware Devices: External Connectivity, Video Port, USB Port, all other Ports.

Unit – II

Processing Unit

Processor Building Blocks: Control Unit, Arithmetic Logic Unit, Register Unit, Comparison of Personal Computer Processors, Processor for Mini, Mainframe, Large and Super Computers, Examples of Various Processor and their families, Category of Processor on basis of Word length, Working of Processor and Execution Process, Machine Cycle, System Clock.

Unit – III

Memory and I/O Devices

Types of Memory: RAM, Cache, ROM, Flash Memory, CMOS, Cloud Storage, Optical Discs: CDs, DVDs. Memory Hierarchy, Input Devices: Keyboard, Mouse, Trackball, Touchpad, Pointing Stick, and others; Output Devices: LCD & Plasma Monitors, other Monitors, Printers: Nonimpact, Ink-Jet, Photo, Laser Printers, Plotters, Speakers, Headphones, and Ear-buds, Data Projectors, Interactive Whiteboards.

Unit – IV

Category of Software with example and brief features

Introduction to Software (s/w), Types of s/w: Application Software & System Software, Various Application Software s/w and their examples, System Programming and System Programs, Needs of System Software, BIOS, POST sequence, Concept & introduction to various system s/w such as: Assemblers, Loaders, linkers ,macro processors, Macros, Compilers, Interpreters, Operating system and formula system, Translators and its types, Editor, Simulator, Emulator, Debugger, Device Drivers, Firmware etc. Assemblers: Structure of assembler, Overview of the assembly process, Basic function, Machine dependent and machine independent features of assembler, Types of assemblers – single pass, multi-pass, cross assembler, Macros & Macro processors.

Unit – V

Loaders and Compilers

Basic Loader Functions, Linking and Concept of Static & Dynamic Relocation, Various loader schemes with their advantages and disadvantages, Compilers, Phases of a Compiler, Comparison of Compilers & Interpreters, Machine dependent & Machine Independent Compiler Features, Aspects of Compilation, Lexical Analysis, Syntax Analysis, Memory Allocation, Compilation of Expressions; Code optimization – local and global optimization.

Text Books:

1. Computer science: an overview, Brookshear, J.G., Pearson Education
2. Fundamental of Computers, Raja Raman V., Prentice Hall of India, New Delhi.
3. System Programming- J. J. Donovan, Tata McGraw-Hill Education.
4. System Programming and Operating systems- D. M. Dhamdhere, Tata McGraw-Hill

5. System Software: An introduction to systems programming- Leland L. Beck, Pearson Education
6. Principles of Compiler Design-Aho and Ullman, Pearson Education.
7. Linkers and Loaders, John R. Levine; Morgan Kaufman

Reference Books:

1. PC Upgrade & Repair Black Book by Ron Gilster.
2. Compiling Techniques, J P Bennett, TMH .
3. Modern Compiler Design, Dick Grune, Koen G.L, Henri Bal, Wiley India.
4. Compiler Construction, Principles and Practice, Kenneth C. Louden; Cengage Learning
5. Fundamentals of Computers & Information Technology, A. Jaiswal, Dreamtech Press.

BCAYT-103
PC Software Packages and Programming in C

Unit – I

MS WINDOWS 7 and MS Word

Installing WINDOWS, Basic Elements of WINDOWS, Working with Windows, Connecting to the Internet: Dial-Up Connections, Broadband Connections, Installing New Hardware & Printer, Installing & Removing Software, Power Settings, MS Word: Menus, Shortcuts, Document types; Working with Documents: Function of tool bar and menu bar. MS Power Point: Creating new Presentation, Different presentation templates, Setting backgrounds, Function of Tool Bar and Menu Bar, Inserting pictures, movies, tables, etc into the presentation, Setting Animation & transition effect, Adding audio and video, Printing Handouts, Generating standalone presentation viewer.

Unit – II

MS Excel and MS Access

Introduction: Spreadsheet & its Applications, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets, Computing data: Formula, Formatting Spreadsheets, Worksheet: Sheet Formatting & style background, Graphs, Printing worksheet. MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

Unit-III

C Programming Concepts

History of C language, C Language Character set, Tokens, Constant, Keywords and Identifiers, Variables Data Types and operators, Loop and Branch statements, .

Unit-IV

Arrays, String, Structures and Unions in C

Arrays, Arrays and Strings, Structures and Unions: Definitions, Initialization and Assigning Values to Members, Arrays of Structures and Arrays Within Structures, Structure with in Structure, Unions- Size of Structures, Functions and Pointers: Recursion - Functions with Arrays, Pointers: Declaration and Initialisation of Pointers, Pointer Expression, Operation on Pointers, Pointer and Arrays, Arrays of Pointers, Pointer and Character Strings, Pointers and Functions, Pointers and Structures, Pointer on Pointers.

Unit-V

File Maintenance in C

File Input/Output: Introduction, Defining, Opening and closing a file, Study of file I/O Operations: fopen (), fclose( ), fputs ( ), fgets ( ), fread ( ), fwrite(), Input / Output Operations on a file, Random access to file, Command line arguments, Time, Date and Localization Functions, Dynamic Allocation Functions, Utility Functions, Wide-Character Functions.

Text Books:

1. Comdex Computer Course Kit (windows 7 with office 2010), Gupta Vikas, Dreamtech Publication
2. Mastering MS Office 2000, Professional Edition by Courter, BPB Publication.
3. MS Office 2000 Training Guide by Maria, BPB Publications.
4. MS Office complete by SYBEX.
5. LET US C, Yashwant Kanetkar, BPB PUBLICATIONS
6. The Complete Reference C, Herbert Schildt, Tata McGraw HILL
7. PROGRAMMING IN ANSI C - by E. Balgurusamy – Tata McGraw HILL
8. PROGRAMMINGWITH C, Byron Govtfred, Tata McGraw HILL

Reference Books:

1. The "C" Programming Language, Briain W. Kenigham & Dennis Ritchie, Pearson
2. The Spirit of "C"- Henrry Mulish, Herbert L. Cooper.
3. Mastering "C" - Crain Bolon.

BCAYT-104
Data Structure

Unit – I

Introduction and Array

Data Types, Data Structure and its Classification, Arrays : Array concept (one dimension, two dimension), Operations for one dimension array (insertion, deletion, traversal), Examples.

Unit –II

Linked Lists

Concept of a linked list, Circular & Doubly linked list, Operations on linked lists, List Manipulation with Pointers, Insertion & Deletion of elements, Applications of linked lists.

Unit –III

Stacks-Queues and Binary Tree

Definitions and Structure, Representation using Array & Linked List, Application of Stack and Queues, Postfix and Prefix Conversion, Evolution of Arithmetic Expressions, Binary Trees: Definition, Memory Representation, Trees traversal algorithms (recursive and non-recursive), threaded trees, BFS, DFS.

Unit –IV

Searching and Sorting

Linear and Binary Search Algorithms, Complexity, Binary Search Trees (construction, insertion, deletion & search), Sorting Algorithms: Bubble Sort, Insertion Sort, Selection Sort, Tree sort, Heap Sort, Quick Sort, Merge Sort & Radix sort, External Sorting.

Unit –V

Analysis of Algorithm

Time and Space Complexity of Algorithms, Average Case & Worst Case Analysis, Asymptotic Notation, Big O notations, Analysis of sorting algorithms -Selection sort, Bubble sort, Insertion sort, Heap sort, Quick sort and Analysis of searching algorithms –Linear Search & Binary Search.

Text Book:

1. Data Structures using C, A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.
2. Data Structures using C by A. K. Sharma, Pearson Education

3. Data Structures and Algorithms, A.V. Aho, J.E. Hopcroft and T.D. Ullman, Addison-Wesley, Low Priced Edition.
4. Fundamentals of Data structures, Ellis Horowitz & Sartaj Sahni, AW Pub.
5. Fundamentals of computer algorithms, Horowitz Sahni and Rajasekaran, Pearson Edu.
6. Data Structures and Program Design in C, Robert Kruse, PHI.

Reference Books:

1. Theory & Problems of Data Structures, Jr. Symour Lipschetz, Schaum's outline by TMH
2. Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
3. Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

BCAYP-105
Software Packages Lab

The lab exercise should be based on MS Windows 7 or higher version and MS Office 2007 or higher version and comprises the theoretical paper as well as practical paper.

Section-A

WINDOWS 7 : Basic Elements of WINDOWS, My Computer, Sharing Devices, Windows Explorer, Accessories: Entertainment, Communication, System Tools, Paint Brush, Calculator, Calendar, Clock, Note Pad, Word Pad Etc., Control Panel, Changing Color and Theme, Changing the Desktop Background, Screen Saver, Adjusting Display Settings, Adjusting Sound, Adjusting the Mouse, Changing the Date and Time.

Section-B

Introduction to MS Word: Menus, Shortcuts, Document types; Working with Documents: Opening Files – New & Existing, Saving Files, Formatting page and Setting Margins, Converting files to different formats- Importing, Exporting, Sending files to others, Editing text documents- Inserting, Deleting, Cut, Copy, paste, Undo, Redo, Find, Search, Replace, Using Tool bars, Ruler- Using Icons, Using help; Formatting Documents: Setting Font Styles, Setting Paragraph style, Setting Page Style, Setting Document Styles, Creating Tables, Drawing, Tools, Printing Documents.

Section-C

Introduction to MS Power Point: Opening new Presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts, Creating a presentation, Formatting a presentation-Adding style, Color, gradient fills, Arranging objects, Adding Header & Footer, Slide Background, Slide layout, Inserting pictures, movies, tables.

Section-D

Introduction to MS Excel: Introduction: Spreadsheet & its Applications, Opening spreadsheet, Menus & Toolbars & icons, Shortcuts, Working with Spreadsheets-Opening a File, Saving Files, Setting Margins, Converting files to different formats- Importing, Exporting and Sending files to others, Spreadsheet addressing, Entering and Editing Data, Computing data- Setting Formula, Finding total in a column or row, Mathematical operations, Formulas, Formatting Spreadsheets & Printing worksheet.

Section-E:

Introduction MS Access: Database concepts: Tables, Queries, Forms, Reports, Opening & Saving database files: Creating Tables, Table Design, Indexing, Entering data, Importing data, Creating Queries: SQL statements, Setting relationship, Creating Forms: GUI, Form, Creating & printing reports.

BCAYP-106
Programming Lab in C

List of C Programs

1. Program to find area and circumference of circle.
2. Program to find the simple interest.
3. Program to convert temperature from degree centigrade to Fahrenheit.
4. Program to calculate sum of 5 subjects & find percentage.
5. Program to show swap of two no's without using third variable.
6. Program to reverse a given number.
7. Program to print a table of any number.
8. Program to find greatest in 3 numbers.
9. Program to show the use of conditional operator.
10. Program to find that entered year is leap year or not.
11. Program to find whether given no is even or odd.
12. Program to shift inputed data by two bits to the left.
13. Program to use switch statement. Display Monday to Sunday.
14. Program to display arithmetic operator using switch case.
15. Program to display first 10 natural no & their sum.
16. Program to print Fibonacci series up to 100.
17. Program to find GCD & HCF of given Numbers using Recursion.
18. Program to find whether given no is a prime no or not.
19. Program to display sum of series 1+1/2+1/3+.....+1/n.
20. Program to display series and find sum of 1+3+5+.....+n.
21. Program to use bitwise AND operator between the two integers.
22. Program to add two number using pointer.
23. Program to find sum, subtraction, multiplication & transpose of matrices.
24. Program to reverse a number using pointer.
25. Program to show input and output of a string.
26. Program to find square of a number using functions.
27. Program to swap two numbers using functions.
28. Program to find factorial of a number using functions.
29. Program to show table of a number using functions.
30. Program to show call by value.
31. Program to show call by reference.
32. Program to find largest of two numbers using functions.
33. Program to find factorial of a number using recursion.
34. Program to find whether a string is palindrome or not.

The break-up of marks for second Year's Practical will be as under :			
Sr. No.	Argument	Maximum Marks	Minimum Passing Marks
1.	Lab Record	15	

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2.	Viva-voce	20	
3.	Program Development and Execution	40	
Total Marks		75	25

********** First Year**********