Aggarwal College Ballabgarh

A Post Graduate Co-educational College
(Affiliated to M. D. University, Rohtak)
NAAC Accredited 'A' Grade (CGPA: 3.40)

Certificate Course in Software Development

Duration	6 Months
Course Code	**Course Name**
BVSD-101	Computer Fundamentals and Programming in 'C'
BVSD-102	PC Software
BVSD-103	Communication Skills
BVSD-104	Software Lab- I
BVSD-105	Software Lab- II

Computer Fundamentals and Programming in 'C'

BVSD-101
Time: 3Hrs

External Marks: 60
Internal Marks: 40

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit-I to Unit-IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-I
Computer Fundamentals: Concept of data and information; Components of Computer: Hardware Input Device, Output Device. CPU: Components of CPU; Memory and Storage Devices; Computer Software: System Software and Application Software; Functions of Operating System. Programming Languages: Machine, Assembly, High Level Language, 4GL; Language Translator; Linker, Loader; Classification of Computers: Micro, Mini, Mainframe, Super computer. Advantages of Computer, Limitations of Computer, Range of Applications of Computer, Social concerns of Computer Technology: Positive and Negative Impacts, Computer Crimes, Viruses and their remedial solutions.

Unit-II
Problem Solving: pseudocode, Problem Identification, Analysis, Flowcharts, Decision Tables, Pseudo codes and algorithms, Program Coding, Program Testing and Execution. C Programming Fundamentals: Keywords, Variables and Constants, Structure of a C program. Operators & Expressions: Arithmetic, Unary, Logical, Bit-wise, Assignment & Conditional Operators, Library Functions, Control Statements: Looping using while, do…while, for statements, Nested loops; decision making using if…else, Else If Ladder; Switch, break, Continue and Goto statements.

Unit-III
Arrays & Functions: Declaration and Initialization; Multidimensional Arrays. String: Operations of Strings; Functions: Defining & Accessing User defined functions, Function Prototype, Passing Arguments, Passing array as argument, Recursion, Use of Library Functions; Macro vs. Functions. Pointers: Declarations, Operations on Pointers, Passing to a function, Pointers & Arrays, Array of Pointers, Array accessing through pointers, Pointer to functions, Function returning pointers, Dynamic Memory Allocations.

Unit-IV
Structures and Union: Defining and Initializing Structure, Array within Structure, Array of Structure, Nesting of Structure, Pointer to Structure, Passing structure and its pointer to Functions; Unions: Introduction to Unions and its Utilities. Files Handing: Opening and closing file in C; Create, Read and Write data to a file; Modes of Files, Operations on file using C Library Functions; Working with Command Line Arguments. Program Debugging and types of errors.

Suggested Readings
1. Gill Nasib Singh: Computing Fundamentals and Programming in C, Khanna Books Publishing Co., New Delhi. 5 | P a g e
2. Kenneth.A.: C problem solving and programming, Prentice Hall.
3. Gottfried, B.: Theory and problems of Programming in C, Schaum Series.
4. Gill, Nasib Singh: Handbook of Computers, Khanna Books Publishing Co., New Delhi.
5. Sanders, D.: Computers Today, Tata McGraw-Hill.
6. Rajender Singh Chhillar: Application of IT to Business, Ramesh Publishers, Jaipur.
7. Cooper, Mullish :The spirit of C, An Introduction to Modern Programming, Jaico Publ. House, New Delhi.
8. Kerninghan& Ritchie: The C Programming Language, PHI.
9. Gottfried, B.: Theory and problems of Programming in C, Schaum Series.
10. E. Balaguruswamy: Programming in C, Tata McGraw Hill.
11. H. Schildt: C-The Complete Reference, Tata McGraw Hill.
12. Y. Kanetkar: Let us C, BPB Publication Note: Latest and additional good books may be suggested and added from time to time.

BVSD-102:   PC Software

External Marks:60
Internal Marks: 40

Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit -I to Unit- IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT - I

Operating system-Definition & functions, Concept of Multi Programming, Multitasking, Multithreading, Multiprocessing, Timesharing, Real time, Types of Operating System.

MS-Windows Basic components of windows, icons, types of icons, taskbar, activating windows, using desktop, title bar, running applications, exploring computer, managing files and folders, copying and moving files and folders. Control panel – display properties, adding and removing software and hardware, setting date and time, screensaver and appearance using windows accessories.

UNIT - II

Documentation Using MS-Word - Introduction to word processing interface, Toolbars, Menus, Creating & Editing Document, Formatting Document, Finding and replacing text, Format painter, Header and footer, Drop cap, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Previewing and printing document, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

UNIT - III

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Cell, cell address, Creating & Editing Worksheet, Formatting and Essential Operations, Moving and copying data in excel, Header and footer, Formulas and Functions, Charts, Cell referencing, Page setup, Macros, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation, Database Management using Excel-Sorting, Filtering, Validation, What if analysis with Goal Seek, Conditional formatting, Collaborating with Other Users, Analyzing and Presenting Complex data.

UNIT - IV

Presentation using MS-PowerPoint: Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Excel Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect., Introduction to MS Access: creating database creating and manipulating tables, forms, queries, reports, modules, importing and exporting of data. Overview of MS Outlook.

SUGGESTED READINGS
1. Microsoft Office – Complete Reference – BPB Publication
2. Learn Microsoft Office – Russell A. Stultz – BPB Publication
3. Courter, G Marquis (1999). Microsoft Office 4000: Professional Edition. BPB.
4. Koers, D (4001). Microsoft Office XP Fast and Easy. PHI.
5. Nelson, S L and Kelly, J (4002). Office XP: The Complete Reference. Tata McGraw-Hill.

Note: Latest and additional good books may be suggested and added from time to time.

BVSD-103:   **Communication Skills**

External Marks: 60

Time: 3 hours   **Internal Marks: 40**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit -I to Unit- IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Introduction to Basics of Communication: Communication and its various definitions, features/characteristics of the communication, process of communication, communication model and theories, barrier to effective communication. Importance of working in Teams, Apply effective conversation skills, practice assertive communication skills.

UNIT-II

Improving LSRW: introduction, verbal and nonverbal communication, listening process, group discussion, forms of oral presentation, self-presentation, dyadic communication, 5C's of communication, Developing dialogues, soft skill.

UNIT-III

Basic vocabulary: how to improve vocabulary, prefix/suffix, synonyms/antonyms, one word substitution, spellings Developing fluency: Grammar (conjunction, auxiliaries, prepositions, articles, tenses……), language games.

Proper use of Language: The Communication Skills, The effective Speech. Effective self-presentation & facing interview: The interview process & preparing forit, The presentation skills.

UNIT-IV

SWOT and Self Awareness, Effective business writing skills, Identify and apply business ethics, Apply Critical thinking and problem solving skills, Identify the importance of planning and prioritizing tasks.

SUGGESTED READINGS
1. Vik, Gilsdorf, ―Business Communication‖, Irwin
2. K KSinha, ―Business Communication‖, Himalaya Publishing House / Galgoria
Publication
3. Bovee, ―Business Communication‖, Pearson _ PHI
4. Mohan, Banerjee, Business Communication, Mac million
5. Raman, Singh – Business communication – Oxford Press
Note: Latest and additional good books may be suggested and added from time to time.

BVSD-104:   **Software Lab- I**

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External Marks: 60
Internal Marks: 40

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Based on paper BVSD-101

Note: Paper BVSD -104 Practical ('C' Language) for External Marks 60 will be conducted by External Examiner appointed by University.

BVSD-105:   **Software Lab- II**

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External Marks: 60
Internal Marks: 40

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Based on paper BVSD-102

Note: Paper BVSD -105, Practical (Ms-Office) for External Marks 60 will be conducted by External Examiner appointed by University.

BVSD-106:   Data Structure through 'C'

External Marks: 60

Time: 3 hours   **Internal Marks: 40**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit -I to Unit- IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

Unit-I

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space tradeoff, Big-O notation. Strings: Introduction, Storing strings, String operations, Pattern matching algorithms. Arrays: Introduction, Linear arrays, Representation of linear array in memory Multidimensional arrays, Operations in Arrays, Sparse arrays. Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way linked list, Threaded lists, Garbage collection, Applications of linked lists.

UNIT – II

Stack: Introduction, Array and linked representation of stacks, Operations on stacks, Applications of stacks: Polish notation, Recursion. Queues: Introduction, Array and linked representation of queues, Operations on queues, Deques, Priority Queues, Applications of queues. Tree: Introduction, Definition, Representing Binary tree in memory, Traversing binary trees, Traversal algorithms using stacks Tree: Header nodes, Threads, Binary search trees, Searching, Insertion and deletion in a Binary search tree, AVL search trees, Insertion and deletion in AVL search tree. B-trees, Searching, Insertion and deletion in a B-tree, B+tree, Huffman's algorithm, General trees.

UNIT – III

Graph: Introduction, Graph theory terminology, Sequential and linked representation of graphs.

Graphs: Warshall's algorithm for shortest path, Dijkstra algorithm for shortest path, Operations on graphs, Traversal of graph, Sorting: Internal & external sorting, Radix sort, Quick sort, Heap sort, Merge sort, Tournament sort, Searching: Liner search, binary search, merging, Comparison of various sorting and searching algorithms on the basis of their complexity.

UNIT – IV

Files: Physical storage devices and their characteristics, Attributes of a file viz fields, records, Fixed and variable length records, Primary and secondary keys, Classification of files, File operations, Comparison of various types of files, File organization: Serial, Sequential, Indexed-sequential, Random-access/Direct, Inverted, Multilist file organization. Hashing: Introduction, Hashing functions and Collision resolution methods .

SUGGESTED READINGS

1. Seymour Lipschutz, "Data Structure", Tata-McGraw-Hill
2. Horowitz, Sahni& Anderson-Freed, "Fundamentals of Data Structures in C",Orientlongman.
3. Trembley, J.P. And Sorenson P.G., "An Introduction to Data Structures With Applications", Mcgrraw- Hill International Student Edition, New York.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Addison- Wesley,

(An Imprint Of Pearson Education), Mexico City.Prentice- Hall Of India Pvt.Ltd.,New Delhi.

Note: Latest and additional good books may be suggested and added from time to time.

BVSD-107: **Object Oriented Programming using C++**

External Marks: 60

Time: 3 hours   **Internal Marks: 40**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit -I to Unit- IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I
Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If .. else ,jump, goto, break, continue, Switch case statements - Loops in C++ : For,While, Do - Functions in C++ - Inline functions – Function Overloading.

UNIT-II
Classes and Objects : Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – BVSD fields and classes – Constructor and destructor with static members.

UNIT-III
Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT-IV
Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding , Polymorphism and Virtual Functions. Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling, File Input and output, String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

SUGGESTED READINGS

1. Ashok N Kamthane , OBJECT-ORIENTED PROGRAMMING WITH ANSI AND TURBOC C++, Pearson Education publication. 4003.
2. E. Balagurusamy, OBJECT-ORIENTED PROGRAMMING WITH C++, Tata Mc-GrawhillPupblication, 1998.
3. Maria Litvin&GrayLitvin , C++ for you, Vikas publication, 4002.
4. John R Hubbard, Programming with C, 2nd Edition, TMH publication, 4002.
   Note: Latest and additional good books may be suggested and added from time to time.

BVSD-108: **Environmental Science**

External Marks: 60
Time: 3 hours   **Internal Marks: 40**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of total 10 parts (short-answer type questions) covering the entire syllabus and will carry 20 marks. In addition to the compulsory question there will be four units i.e. Unit -I to Unit- IV. Examiner will set two questions from each Unit of the syllabus and each question will carry 10 marks. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit.

UNIT-I

Environmental studies – Nature, scope and importance, need for public awareness; natural resources – renewable and non-renewable resources, use an overexploitation/ over-utilization of various resources and consequences; role of an individual in conservation of natural resources; equitable use of resources for sustainable lifestyles

UNIT-II

Ecosystems – concept, structure and function of an ecosystem; energy flow in the ecosystem; ecological succession; food chains, food webs and ecological pyramids; types of ecosystem – forest ecosystem, grassland ecosystem, desert ecosystem, aquatic. Ecosystems Environmental Pollution – Definition, cause, effects and control measures of different types of pollutions – air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards; solid waste management – causes, effects and control measures of urban and industrial wastes; role of an individual in prevention of pollution

UNIT-III

Social issues and the environment – Sustainable development, urban problems related to energy, water conservation, rain water harvesting, watershed management; resettlement and rehabilitation of people, its problems and concerns; climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust; Wasteland reclamation, consumerism and waste products

UNIT-IV

Environmental legislation – Environment Protection Act.Air (prevention and control of pollution) Act. Water (prevention and control of pollution) Act, Wildlife Protection Act, Forest Conservation Act

SUGGESTED READINGS:
1. Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi
2. KaushikAnubha, C.P. Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd. Publishers
3. Joseph Benny, Environmental Studies, Tata McGraw Hill Publishing Company Ltd., New Delhi
4. Ubaroi, N.K., Environment Management, Excel Books, New Delhi
   Note: Latest and additional good books may be suggested and added from time to time

BVSD-109:   **Software Lab-III**

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External Marks: 60
Internal Marks: 40

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Based on paper BVSD-106

Note: Paper BVSD -109 Practical (**Data Structure Through'C'**)for External Marks 60 will be conducted by ExternalExaminer appointed by University.

BVSD-110:   **Software Lab-IV**

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External Marks: 60
Internal Marks: 40

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Based on paper BVSD-107

Note: Paper BVSD -110 Practical (**Object OrientedProgramming using C++**)for External Marks 60 will beconducted by External Examiner appointed by University.