

Shri. Dnyaneshwar Maskuji Burungale Science & Arts College, Shegaon

DEPARTMENT OF COMPUTER SCIENCE

SYLLABUS

(Prescribed by Sant Gadge Baba Amravati University, Amravati)

B. Sc. Part-I (Semester-I) CBCS

Code of Subject: 1CS1 Fundamentals of Computer and C Programming

- Unit I:** Introduction to Computer, Characteristics, Generations of Computers, Block diagram of Computer. **Memories:** Primary Memories : RAM, ROM, and its types, Cache Memory, Secondary Storage Devices : Hard Disk, SSD, Pen drives. **I/O Devices:** Keyboard, Mouse, Scanner, Touch Screen, Monitors: LCD & LED. Printers: Impact and non-impact.
- Unit II:** **Operating System:** Definition, Functions of Operating System, Types: Batch Mode, Multiprogramming, Time sharing , Online Real Time, Distributed O.S. Booting process. **Windows:** Introduction, Features and taskbars, Desktop, Customizing Desktop.
- Unit III:** Programming Concept: Algorithm, flowcharting, Types of programming languages, Programming process: Program design, Coding, Compilation & Execution, Testing & Debugging, Documentation. Structured Programming : History of C language, Advantages, Structure of C program, Character set, Identifiers, Keywords, Constants and Variables, Symbolic constants, Qualifiers, Type conversion. Operators and Expressions.
- Unit IV:** **I/O Operations :** Formatted I/O : scanf(), printf(), **Unformatted I/O :** getch(), getchar(), gets(), putchar(), puts(), **Control structures:** Branching: if, if-else, Conditional operator(? :), nested if, switch. Looping: while, do-while, for statements, comma operator, goto, break, continue, nested loops.
- Unit V:** **Arrays-**Declaration and initialization of one and two dimensional array. **Structure-**Definition, declaration, initialization, array of structure, nested structure, union. **Pointers** - Declaration, initialization, pointers arithmetic.
- Unit VI:** **Functions in C:** Introduction, definition of function, function prototype, categories of function, actual argument, formal argument, function calling: call by value, call by reference, function parameters, local and global variable, functions with array, function recursion. **String functions** - String functions : strlen(), strcpy(), strcmp() & strcat().

Books Recommended:

Text books:

- 1) Computer Fundamentals & Networking - P.K.Sinha
- 2) Programming in C: E Balagurusamy : TMH Publication.

Reference Books:

- 1) Fundamentals of Computer - V.Rajaraman
- 2) Computer Network-Andrew Tanenbaum
- 3) ABC of Internet - Christian Crumblish (BPB)
- 4) ANSI C- Dennis Ritchie
- 5) Programming in C - V.Rajaraman
- 6) Programming with C: Venugopal K.R. TMH, Publication.
- 7) Programming with C: Byron Gottfried , Schaum Series Publication.
- 8) Fundamentals of IT and C programming by C H Sawarkar, A P Chendke, G P Gawali Dnyanpath Publication.
- 9) Web Technology and Advance Programming by Dr. P N Mulkalwar, M M Bhonde, A A Tayade. Dnyanpath Publication.

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SYLLABUS

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B. Sc. Part-I (Semester-II) CBCS

Code of Subject: 1CS2

Data Structure and OOPS

- Unit I: Data structure:** Introduction to data structure, Types of data structure: Primitive and Non-primitive, Linear and Non-linear data structure, Data structure operations. **Array:** Definition and concepts, Memory Representations, Operations: Traversing, Insertion, Deletion. **Stacks:** Definition and concepts, Memory Representations, Operations: Traversing, Insertion, Deletion.
- Unit II: Queue:** Definition and concepts, Memory Representations, Operations: Traversing, Insertion, Deletion. Types of Queue. **Linked List:** Definition and concepts, Memory Representations, Types of Linked List, and Operations: Traversing, Insertion, Deletion. **Tree:** Definition and Terminologies, Memory Representations of Trees, Types of Trees : Binary Trees, Complete Binary Trees, Binary Search Trees, Traversing: Preorder, Inorder, Postorder, Insertion, Deletion.
- Unit III: Searching and Sorting:** Definition and concept. **Searching Techniques:** Linear Search, Binary Search and Indexed Sequential Search. **Sorting Techniques:** Bubble Sort, Selection Sort, Insertion Sort, Radix Sort, Merge Sort & Quick Sort.
- Unit IV: Object Oriented Programming:** Features, Advantages and Applications of OOPS. Comparisons between POP and OOP, Introduction to C++, Program structure in C++. **Classes and Objects:** Classes and Objects Specifiers, Defining data member and member functions, Accessing members. **Managing Console I/O:** Formatted and Unformatted, Usage of manipulators: endl & setw, Scope Resolution Operator.
- Unit V: Functions in C++:** Passing objects to and returning objects from functions. Function Overloading and Default argument, Inline function, Friend function. Array of Objects, Pointer to objects, 'this' pointer. Constructor and Destructor: Types of constructor, Usage of Constructor.
- Unit VI: Operator Overloading:** Definition, Overloading Unary and Binary operators. **Inheritance:** Definition, Types of Inheritance, Visibility mode; Types of inheritance with example, Virtual base classes and Abstract base classes.

Books Recommended:

Text books:

1. Object Oriented Programming with C++ : E Balagurusamy TMH
2. Data Structures , Seymour Lipschutz , Schaum's Outlines Series, Tata McGraw-Hill.
3. Text Book of Computer Science (Data Structure and C++): S D Pachpande, R B Ghayalkar and Athar Iqbal, Dnyanpath Publication.

Reference Books:

1. Fundamentals of Data Structures in C, Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed. W. H. Freeman and Company.
2. Object-Oriented Programming in C++, Fourth Edition, Robert Lafore, SAMS Publication.
3. Data Structure and Algorithms :Aho, Hopcroft, Ulman
4. Introduction to Data Structure : Bhagat Singh, Thomas L Naps
5. Mastering in C++ by K. R. Venugopalan.
6. Data Structure and C++: P.S.Bodkhe, A.A.Tayade, S.B.Agarmore, Dnyanpath Publication.

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SYLLABUS

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B. Sc. Part-II (Semester-III) CBCS

Code of Subject: 2CS1

Networking & Web Technology

- Unit I: Introduction to Networking:** Introduction, Need of computer communication network, Communication protocol, Types of network. **Topology:** Ring, Bus, Star & Mesh. LAN, MAN, WAN and Internet. Connection v/s Connectionless protocol.
- Unit II: OSI Reference Model:** Introduction, OSI Model, Functions of seven layers of OSI. **Data Transmission Media:** Guided Media and Wireless media. **Switching:** Circuit, Message, Packet. **Multiplexing:** Frequency Division, Time Division.
- Unit III: Internet:** History, Applications of Internet, Types of Internet Connection: wired and wireless. Internet Protocols: TCP/IP, FTP, HTTP, URL, e-mail address, WWW, Web browsers, Search Engines.
- Unit IV: HTML:** History of Markup Languages, Introduction to HTML, Structure of HTML Document, Tags: <HTML>, <HEAD>, <TITLE>, <BODY>, Heading tags, <P>,
, <HR>, , <I>, <U>, , <PRE>, <BIG>, <SMALL>, , <STRIKE>, <SUB>, <SUP>, <A>, <LINK>, , <MARQUEE>, <BLOCKQUOTE>, Table tags and its attributes, List tags and its Attributes, tags.
- Unit V: XML:** Features of XML, Simple XML document, Elements, Attributes, **Components of XML document:** document prolog and document instance. **DTD (Document Type Definition):** Introduction, Need of DTD, declaring elements, element content model, declaring attributes, attribute types, Internal and External DTD.
- Unit VI: Style Sheet:** Introduction, Advantages and applications of style sheet, **CSS:** Introduction, syntax of CSS with example, Type of style sheet (Embedded, External, Inline and Class), Units, Classes and Id attributes, **Properties:** Text, Font, Color, Background, Border, Height, Margin, width. CSS with HTML and XML.

Books Recommended:

Text Books:

1. Computer Networks (Fourth Edition) - Andrew S. Tanenbaum (PHI)
2. Mastering XML: Ann Navaro, Chuck White, Linda Burman, BPB Publication.
3. HTML Complete :BPB Publication

Reference Books:

1. Business Data Communication & Networking (fifth edition) - Fitzerland & Dennis.
2. Data and Computer Communication – William Stallings (Pearson)
3. Data Communication and Networking – Behrouz A. Forouzan (McGraw Hill)
4. Computer Network & Internet - Douglas E. Comer (Pearson)
5. The Complete reference-Web Design, Second Edition By Thomas A. Powell, TMH.
6. Inside XML : BPB Publication.

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B. Sc. Part-II (Semester-IV) CBCS

Code of Subject: 2CS2

RDBMS & Core Java

- Unit I: Fundamental of DBMS:** Traditional Vs DBMS File approach, DBMS Architecture, Data Models, Relational Model, Relations, Domain and Attributes, Keys, E-R diagram, reducing ER diagram to table, Functional Dependency, Normalization: 1NF, 2NF, 3NF, 4NF, BCNF.
- Unit II: Introduction to SQL:** Components of SQL, data types, operators **DDL Commands:** CREATE, ALTER, DROP, RENAME, **DML Commands:** SELECT, INSERT, DELETE & UPDATE; **Clauses:** ORDER BY, GROUP BY and HAVING; **Joins and Unions:** Self, Equi and Outer Join, Unions and Intersection. Functions: aggregate functions, string functions.
- Unit III: PL/SQL:** Features and block structure, variables and constant, data types, Identifiers, Operators and expression, Conditional statement, iterative statement. **Cursor:** Concepts of cursor, types of cursor, declaring, opening, using cursors, fetching data, closing a cursor, cursor attributes, Handling Exceptions, Creating Procedures, Creating Function, **Triggers:** Create Triggers, Types of Triggers, Creating BEFORE and AFTER Triggers, INSTEAD-OF triggers, Inserting, Updating and Deleting Triggers.
- Unit IV: Introduction to JAVA:** History and evolution, Feature, JRE, JDK, JVM, Tokens of Java, Data types and Literals, Operators, Structure of Java Program, Access controls, modifiers, type conversion and casting, **Control of Flow:** Selection Statements, Iteration Statements. Command Line Argument, Arrays.
- Unit V: Classes & OOPs:** Class, Object, Method, **Constructor:** types, this Keyword, **Polymorphism:** Overloading & Overriding, **Inheritance:** types of inheritance, Super, Abstract class, **Interfaces:** Interface concept, Defining, and Implementing of Interface., Using Final (variables, methods and classes). Garbage Collection.
- Unit VI: String & Packages: String:** String operation, String comparison, Searching and modifying string, StringBuffer. Wrapper classes, **Packages:** Package concept, Defining Package, organizing classes and interfaces in packages, making jar files for library packages, Java In-built Package.

Books Recommended:

Text Books:

1. Introduction to Database Management Systems by Muzumdar TMH
2. Database System Using Oracle: A simplified Guide to SQL & PL/SQL : Nilesh Shah, PHI Publication
3. Herbert Schiedt "Java the Complete Reference", TMH
4. Teach Yourself 'Java' in 2 Hrs : By Sams.
5. Java for You : By P. Koparkar

Reference Books:

1. Fundamentals of Database Systems (4th Ed) By: Elmasri and Navathe
2. Database System Concepts (4th Ed) By: Korth, Sudarshan, Silberschatz
3. Patricks Naughton, "Java Handbook", Osborne McGraw Hill
4. Programming with JAVA - A Primer : By E. Balguruswamy (Tata McGraw)

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B. Sc. Part-III (Semester-V)

Paper-5S: .Net Technology and Java Programming

- Unit I: Introduction to .NET Framework:** NET framework, MSIL, CLR, CLS, CTS, Namespaces, Assemblies The Common Language Implementation, Assemblies, Garbage Collection, The End to DLL Hell – Managed Execution
- Unit II: Introduction to visual programming:** Concept of event driven programming - Introduction to VB.Net environment, The .NET Framework and the Common Language Runtime. Building VB.NET Applications, The Visual Basic Integrated Development - Basic Language - Console application and windows application, Data types, Declaring Variables, scope of variables, operators and statements.
- Unit III: Decisions and loop:** Making Decisions with If . . . Else Statements, Using Select Case, Making Selections with Switch and Choose, Loop statements - Do Loop, for, while - The With Statement - Handling Dates and Times - Converting between Data Types - Arrays - declaration and manipulation - Strings & string functions – Sub Procedures and Functions.
- Unit IV: Introduction to JAVA:** History and evolution ,Feature, JDK, JVM, Difference between C++ and Java, Structure of Java Program, Keywords, Variable, Data types and Literals, Operators Control of Flow, (Selection Statements, Iteration Statements), Command Line Argument, One dimensional and two dimensional array.
- Unit V: Classes and inheritance:** Class, Object, Method, Overloading Method, Constructor, Constructor Overloading, this Keyword, Inheritance: Introduction to Inheritance, Super, Multilevel Hierarchy, method overriding, Abstract class, Using Final (variables , methods and classes).
- Unit VI: String, Package and Interface:** String: String operation, String comparison, Searching and modifying string, Package: Package concept, Defining Package, Finding Package, Java In-built Packages Interface: Interface concept, Defining, and Implementing of Interface.

Books Recommended:

- 1) .NET Framework, OREILY Publication.
- 2) Steven Holzner, Visual Basic .NET Black Book
- 3) Rebecca Riordan, VB.NET for Developers, Keith Franklin, SAMS
- 4) Jason Beres, Sams Teach Yourself Visual Studio .NET 2005 in 21 Days,
- 5) Jesse Liberty, Learning Visual Basic .NET
- 6) The Complete Reference JAVA2 by Herbert Schildt (Tata McGraw)
- 7) The Complete Reference JAVA by Patrik Noughton
- 8) Programming with JAVA - A Primer : By E.Balguruswamy (Tata McGraw)
- 9) Programming in JAVA : By S.S.Khandare (S.Chand)
- 10) Teach Yourself 'Java' in 2 Hrs : By Sams.
- 11) Java for You : By P. Koparkar

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B. Sc. Part-III (Semester-VI)

Paper-6S: Advanced Java and VB.net

- Unit I: Exception Handling and Multithreading: Exception Handling:** Concept of Exception handling, Type of Exception, Try, Catch, and Finally. Multiple Catch blocks, Nested Try Statements, throw, throws. **Multithreading:** Multithreading concept, life cycle, creating and running thread, thread priority.
- Unit II: Applet:** Introduction to Applet, Applet life cycle, HTML applet tag with all attributes, Running the applet, Passing parameters to applets, Displaying using applet viewer, getDocumentBase() and getCodeBase() methods, Applet context, Applet vs Application, Graphics introduction, Graphic class, draw lines, circle, rectangle, ellipse.
- Unit III: Event Handling and AWT:** Introduction, Event delegation model, Java AWT event description, sources of event, Event listener interfaces, Adapter classes, Inner classes. AWT (Abstract Window Toolkit): Introduction, AWT Controls Label, Button, Checkboxes, Lists, ScrollBar, TextField, TextArea, Layout manager.
- Unit IV: Windows Applications: Forms:** Adding Controls to Forms, Handling Events, MsgBox, InputBox, Working with Multiple Forms, Setting the Startup Form, SDI & MDI Forms, Handling Mouse & Keyboard Events, **Common controls:** Text Boxes, Rich Text Boxes, Labels, Buttons, Checkboxes, Radio Buttons, Group Boxes, List Boxes, Checked List Boxes, Combo Boxes, Picture Boxes, Scroll Bars, Tool Tips, Timers, properties – methods.
- Unit V: Object Oriented Programming: Classes and Objects:** Class definition, Creating objects, Defining Member functions, Methods and Events, Attaching a class with form, Delegates. **Exceptions Handling:** Exception classes in .net framework, Structured and Unstructured exceptions, tracing errors, breakpoints, watch, Quick watch.
- Unit VI:** Data Access with ADO.Net, accessing data with Server Explorer, Accessing Data with data Adaptors and Data sets, Creating a new data connection, creating and populating Data set, displaying data in Data Grid, selecting a data provider, Data accessing using Data adapter Control, Binding Data to Controls.

Books Recommended:

- 1) Steven Holzner, Visual Basic .NET Black Book
- 2) Rebecca Riordan, VB.NET for Developers, Keith Franklin, SAMS
- 3) Jason Beres, Sams Teach Yourself Visual Studio .NET 2005 in 21 Days,
- 4) Jesse Liberty, Learning Visual Basic
- 5) The Complete Reference JAVA2 by Herbert Schildt (Tata McGraw)
- 6) The Complete Reference JAVA by Patrik Noughton
- 7) Programming with JAVA - A Primer : By E.Balguruswamy (Tata McGraw)
- 8) Programming in JAVA : By S.S.Khandare (S.Chand)
- 9) Teach Yourself 'Java' in 2 Hrs : By Sams.
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