

SYLLABUS FOR B.Sc. COURSE

SUBJECT: COMPUTER SCIENCE

(Pass Course)

FOR

Nagaland University

B.Sc. Course Structure

Subject : Computer Science

Semester	Course No	Course Name	Credits	Marks	Course
I	COMP101	Computer Basics(Theory)	4	100	Pass
	COMP102	Computer Basics (Practical)	1	50	Pass
II	COMP201	C Programming (Theory)	4	100	Pass
	COMP202	C Programming (Practical)	1	50	Pass
III	COMP301	Data Structures using C (Theory)	4	100	Pass
	COMP302	Data Structures using C (Practical)	1	50	Pass
IV	COMP401	Database Management Systems (Theory)	4	100	Pass
	COMP402	Database Management Systems (Practical)	1	50	Pass
V	COMP501	Visual Basic (Theory)	4	100	Pass
	COMP502	Visual Basic (Practical)	1	50	Pass
VI	COMP601	Web Technology (Theory)	4	100	Pass
	COMP602	Web Technology (Practical)	1	50	Pass

SEMESTER I

COMP101: Computer Basics (Theory)

Objective: The objective of this paper is to introduce basic computer concepts to the students and help them to acquire the knowledge for developing their hardware and software skills.

Unit-I: Introduction to computer

Introduction to Computer:-Definition, Characteristics, Capabilities and Limitations. Introduction to Operating System. Components of a Computer System-Control Unit, ALU, input/output functions and characteristics. Memory Introduction, Classifications- Volatile Memory and Non-Volatile , Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory.

Unit-II: Input and Output devices:

Input, Output Units:-Computer Keyboard, Pointing Devices: Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digitalcamera.

Hard Copy Devices:- Impact and Non- Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer, Comb Printers, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters.

Unit-III: Software

Software and its different types- System Software, Application software.Hardware, Firmware, Compiler, Interpreter and Assembler. High Level Language and Low Level Language.

Unit IV: Windows Operating System: Operating system-Definition & functions, basics of 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, screen saver and appearance. Using windows accessories

Unit-V- Disk Operating System

Internal and External Commands, Difference between External and Internal Commands. Internal Commands:- MD, CD, RD, COPY CON, TYPE, DATE & TIME, VOLUME VERSION, REN, PROMPT, CLS, DIR/P/W, COPY , DEL Etc. External commands:-FORMAT , DISKCOPY, DISKCOMP, XCOPY, CHKDISK, SCANDISK, HELP, DEBUG, PRINT etc.

Text Books:

1. Computer Fundamentals – B. Ram – New Age International Publishers
2. C.S. French "Data Processing and Information Technology", BPB Publications
3. P.K Sinha `Computer Fundamentals`, BPB Publications
4. S.K.Basandra, "Computers Today ", Galgotia Publications.

COMP102: Computer Basics (Practical)

The student needs to be exposed/shown various components and supposed how to switch on a computer.

- Creating and renaming of files and folders
- Opening and closing of different Windows,
- Windows Setting, Control Panels, Notepad, Window Accessories.

Switching Between DOS and Windows, Basic DOS Commands:

- Disk drives, Default drive
- Changing the default drive ,
- Directories ,Specifying a filename ,Copying files
- Abbreviating filenames in DOS
- Listing the contents of a file on the monitor, Subdirectories,
- The AUTOEXEC.BAT file

An Introduction to Word Processing:

- Opening Documents and Closing documents,.
- Save and Save as, Page Setup Printing of Documents.
- Display/Hiding of Paragraph Marks
- Inter Word Space, Moving Around in a Document
- Paragraph and Tab Setting, Text Selection
- Cut, copy and paste, Font and Size selection
- Draw Table

SEMESTER II

COMP201: C Programming (Theory)

Objective: The objective of the course is to introduce the fundamentals of C programming language and develop the skills for solving problems using computers. This will also help them improve their reasoning and logical abilities.

Unit I: C fundamentals

C Fundamentals: The C character set, identifiers and keywords, Data types, constants, variables and arrays, declarations, symbolic constants, Operators (Arithmetic, unary, relational, logical, assignment), expressions, statements, C program structure, Need of header files, Process of compiling and running a C program.

I/O functions: Header files (stdio.h, conio.h) - getch(), getche(), getchar(), putchar(), scanf(), printf(), gets(), puts(), clrscr(), window().

Unit II: Control statements

Control statements: Decision making and branching (**if..else**, **switch**), Decision making and looping (**while**, **do .. while**, **for**), Jumping (**break**, **continue**, **goto**), Nested loops

Unit III: Arrays and Functions

Arrays: Array, Single dimensional, Multi dimensional array.

Functions: Overview (definition, declaration), defining a function, accessing a function, function prototypes, call by value, call by reference. String functions (strcpy(), strcmp(), strcmpi (), strlen(), strrev (), strcat (), toupper (), tolower ()), Math functions (sqrt (), abs (), sin (), cos ()), Standard function- exit (), Memory allocation functions (malloc (), free (), realloc(), calloc()).

Unit IV: Pointers

Pointer definition and declarations, passing pointer to a function, pointer and one dimensional arrays, Operation on pointers, pointers and multidimensional arrays, arrays of pointers, passing functions to other functions, pointer to function, functions returning pointers.

Unit V: Structure and Union Defining a structure, processing a structure, user defined data types, structures and arrays, structures and pointers, passing structures to a function, Union, Union of structures, Enumerated, typedef.

Recommended Text Books

1. E. Balaguruswamy Balaguruswamy, *Programming in ANSI C*, (Second Edition), Tata McGraw Hill publication,
2. Yashavantashavant Kanetkar Kanetkar, *Let us C* , (Fourth Edition), BPB Publications, 2003

References

1. Byron S. Gottfried Gottfried, *Theory and Problems of Programming with C*, (Second Edition), Tata McGraw Hill Publication

COMP202: C Programming (Practical)

Practical Assignments

(Questions need not be restricted to this list)

1. Write a program to display the message "Welcome to the C programming world" on the screen.
2. Write a program to find out the greatest of three numbers.
3. Write a program for **swap swapping** the two numbers with / without using another variable.
4. Write a program to find whether the given year is a leap year or not (use % modulus operator)
5. Write a program to find out the real roots of quadratic equation, $Ax^2+Bx+C=0$.
6. Write a program to convert the given temperature in Fahrenheit to Celsius using the following conversion formula, $C=(F-32)/1.8$.
7. 11. Write a program to check whether the given string is palindrome or not.
8. 18. Write a program to generate positive prime numbers.
9. 19. Write a program to display the multiplication table of a given number from 1 to 20.
10. 20. Write a program to display the multiplication table of a given number for a given range.
11. 27. Write a program to display the multiplication table of a given group of numbers (maximum five numbers) for a given range.
12. 24. Write a program to find the sum of row, column, and diagonals of the given matrix.

SEMESTER III

COMP301: Data Structures using C (Theory)

Objective: Objective of the course is to understand the ways of storing and organizing [data](#) in a [computer](#) and provide a means to manage huge amounts of data efficiently.

Unit I: Introduction to data structures

Definition. Classification of data structures. Operations on data structures, Introduction to Time and space Complexity. Primitive Data Structures Integer, Character, float, strings-memory representation and primitive operations, String manipulation using pointers. Arrays Storage Representation for 1D and 2D arrays, Insertion and deletion on 1D arrays, advantages and disadvantage of arrays.

Unit II: Linked Lists

Pointers, Dynamic Memory Allocation, singly Linked Lists, Operations on linked lists, Insertion and deletion of a node, Introduction to circularly linked lists and Doubly linked lists.

Unit III: Stacks

Concepts, Operations, sequential and linked implementation, Application of stacks, recursion, tower of Hanoi, infix to postfix conversion, Evaluation of Postfix Expressions.

Unit IV: Queues

Concepts, operations, sequential and linked implementation, Circular queues, Priority queues and Dequeues (Introductory concepts), Application of queues.

Unit V: Trees, Searching and sorting

Definitions and concepts – Binary trees, Sequential and Linked Representation of Binary Tree, Insertion and deletion on binary trees, Binary Tree Traversal Graphs Concepts, Sequential and linked representation of Graphs, BFS and DFS Traversal, Linear and Binary search, Selection sort, Insertion sort, Quick sort, Merge sort.

Recommended Text Books:

1. Ashok N Kamthane, "PROGRAMMING & DATA STRUCTURES" – Pearson Education
2. Ellis Horowitz & Sartaj Sahni: Fundamentals of Data Structure, Galgotia Book Source
3. Data structure using C – Aaron M Tanenbaum, Yedidyehlangsam, Moshe J Augenstein.

COMP302: Data Structures using C (Practical)

Practical Assignments

(Questions need not be restricted to this list)

1. Write a program in C to implement simple Stack, Queue, Circular Queue, Priority Queue.
2. Write a menu driven program that implements singly linked list for the following operations:
Create, Display, Concatenate, merge, union, intersection
3. Write a menu driven program that implements doubly linked list for the following operations:
Create, Display, Count, Insert, Delete, Search, Copy, Reverse, Sort
4. Write a menu driven program that implements doubly linked list for the following operations:
Create, Display, Concatenate, merge, union, intersection
5. Write a menu driven program that implements Singly circular linked list for the following operations:
Create, Display, Count, Insert, Delete, Search, Copy, Reverse, Sort
6. Write a program in C for sorting methods.
7. Write a menu driven program in C to
 - a. Create a binary search tree
 - b. Traverse the tree in Inorder, Preorder and Post Order
 - c. Search the tree for a given node and delete the node
8. Write a program in C to implement insertion and deletion in AVL tree

SEMESTER IV

COMP401: Database Management Systems (DBMS) (Theory)

Objective: The objective of the course is to let the student learn the design and management of database.

Unit – I

DBMS Definition, Characteristics of DBMS ,Application and advantages of DBMS, Instances , Schemas and Database States, Three Levels of Architecture , Data Independence, DBMS languages, Data Dictionary.

Unit – II

Data Models types and their comparison, E-R Diagram, RDBMS –Concept,

Unit – III

Relational Algebra (selection, projection, union, intersection, Cartesian product, Different types of join like theta join, equi-join, natural join, outer join) Functional Dependencies, Normalization: 1NF, 2NF, 3NF, BCNF, 4NF 5NF.

Unit – IV

Introduction to SQL, DDL, DML, and DCL statements, Creating Tables, Adding Constraints, Altering Tables, Update, Insert, Add, Delete commands, Joining Multiple Tables

Unit – V

Introduction to PL/SQL (blocks of PL/SQL, Variables, constants), Control Structure Introduction to Stored Procedures, Functions, Cursor and Triggers

Text Books :

1. Elmasri&Navathe, Fundamentals of Database systems, Addison &Weisely, New Delhi.

References:

1. H. F. Korth& A. Silverschatz, Database Concepts, Tata McGraw Hill, New Delhi
2. C. J. Date, Database Systems, Prentice Hall of India, New Delhi

COMP402: Database Management Systems (DBMS) (Practical)

Draw the E-R diagram. Create the database in systems like Oracle, MySQL, MSSQL. Compare the features of each of these systems.

Frame and execute the SQL queries for the following:

- List name of all students who have registered for courses in more than one department.
- List name and SSN of all students who have registered for more than one course in a specified department.
- List name of all students who have got atleast B grade in all the courses taken by him/her.
- List name of all students who have got A in all the courses offered by CS department.
- List the highest grade obtained in each course by students majoring in each of the departments.

SEMESTER V

COMP501: Visual Basic (Theory)

Objective: The main objective of this course is to give a strong foundation in Visual Programming including Crystal Report, Menu Design, and Database Management.

Unit I: Overview Environment

Overview: Visual Basic Application Types, Visual Basic Application Components- (Projects, Forms, Controls, Code modules, Class modules, User controls, Property pages)

VB Environment: Menu Bar, Toolbar, Toolbox, Form, Project explorer, Property window, Immediate window, Form layout window. Creating a project, Forms, Naming a project, Saving a project.

Controls: Label control, TextBox control, Command Button, Frames, Option Buttons, Check Boxes, Picture control, Image Control, Shape control, Line control, Timer control, HscrollBar control, VscrollBar control, FileListBox control, DirListBox, DriveListBox control.

List and Menus: List Box control, Combo Box Control, Menu editor.

Unit II: Programming

Variables: Data types, Declaring variables, Scope and lifetime of a variable, Examples of variables, Variant data types.

Arrays: Different Array types, Control Array.

Conditional Logic and Looping: If... Then, Select... Case, Do...While, While...Wend, Loop...While, Do...Until, Loop...Until, For... Next, Nested constructs, Exit For/Exit Do, Exit Sub/Exit Function

Unit III: Built in Functions

Built-in Functions: String Functions, Date Functions, MsgBox, InputBox, Common Dialog Control.

Unit IV: Data control and Programming

JET database Engine, ADODC, DAO Data Control

Data Entry with ADO: Creating a new ADO project, Adding data, Editing data, Deleting data.

Unit V: Creating Reports

Data Report and crystal Report.

Text Books

1. Paul D Sheriff Sheriff, Paul Sheriff Teaches Visual Basic 6, Prentice Hall of India

2. Evangelos Petroutsos, Mastering Visual Basic 6, BPB Publication,

References

1. Michel C Amundsen and Curties L Smith Smith, Teach Yourself Database Programming with Visual Basic 5 in 21 Days, TechMedia
2. Peter Norton, Peter Norton's Guide to Visual Basic 6, Techmedia

COMP502: Visual Basic (Practical)

Practical Assignments

(Questions *need not be restricted to this list*)

1. Design a form and place a TextBox in it. Call it (assign its name property) txtInput. Place a Command Button and call it cmdExtract. Assign the caption property of the Command button as "Extract". Write a program to extract each digit or letter of a number, word or sentence that is entered in txtInput and display them in a second Text Box called txtOutput, one at a time on the click of a button.
2. Design a form with suitable controls to input a single digit number and write appropriate event handlers to check if the number is automorphic or not. A number is called automorphic if the last digit of the square of the number is same as the number itself. (e.g. 6).
3. Design a form with suitable controls and write appropriate event handlers to take in a string and determine whether the given string is palindrome or not.
4. Design a form with suitable controls and write appropriate event handlers to generate the calendar of a given month. The user must enter the month and the year. Assume that 1st January 1900 was a Monday. Do not use the standard Visual Basic functions to generate the calendar.
5. Write a program to calculate and display the factorial of a given number, using a recursive function.
6. The following information is to be maintained regarding the users of electricity: Name, code and units consumed. Write a program that will take the name and units consumed and hence generate a bill. For the first 20 units cost is 30p/unit, for the next 20 units, 40p/unit, for the rest, 50p/unit. Make provisions for reading, editing and deleting data. Make provisions to keep the rates alterable. Use ADO data control.

SEMESTER VI

COMP601: Web Technology (Theory)

Unit I: Web Publishing

Web Browser, WWW, Web Server , The Phases of web site development , Implementation, Maintenance, Testing, What are Links or URLS

Unit II: The Markup Tags

Basic HTML Concepts,HTML, HEAD, TITLE, BODY, Paragraphs, Lists, Formatted and Unformatted Text , Hyperlink,Font (Size, Color), image.

Unit III: Introduction to Dreamweaver

The Dreamweaver Interface , Toolbars , Menus, Accessing Code, Building Styles Sheet.

Unit IV: PHP

Why PHP and MySQL?, Server-side web scripting, Installing PHP, Adding PHP to HTML, Syntax,and Variables, Passing information between pages, Strings, Arrays and Array Functions, Numbers,Basic PHP error/problems.

Unit V: Designing Web Pages

Working with text , Inserting Images, Web Graphic Format GIF, JPEG, PNG, Inline Images
Background images, Horizontal Rules, Banner Ads, Rollover Images , Establishing Web Links
Understanding URLs, Adding an E-Mail Link, Navigating with Anchors, Working with Divs and Layers,1 Placing <div> tags, Creating Layers, Modifying a Layer, Creating Lists, Unordered Lists, Ordered Lists, Definition Lists, Nested Lists

Reference Books

1. Dreamweaver MX 2004 BIBLE
2. WEB PUBLISHING BY MONICA D' SOUZA & JUDE D' SOUZA
3. COMPLETE REFERENCE - HTML – TOWELL

COMP602: Web Technology (Practical)

- Creation of the Home Page of a Web Site (HTML) with proper links.
- Creation of a dynamic web page using appropriate web development tool (e.g. Dream weaver) for three different concepts.
- Students should be given orientation of web/multimedia usability issues and interface design basics.

SYLLABUS OF COMPUTER SUBJECT (common Paper) FOR UG PROGRAMME IN THE SEMESTER SYSTEM

Semester III

Semester	Course No	Course Name	Theory	Course
III	CSC301	Computer and its Application	100	Pass (Common Paper)

CSC301: Computer and its Applications

Unit-I: Fundamentals of Computer

Basic Components of a Computer System-Control Unit, ALU, Input/output functions and characteristics. Memory Introduction, Classifications- Volatile Memory and Non- Volatile , Flash Memory, ROM, RAM, EPROM, PROM, EEPROM other types of memory.

Unit-II: Input and Output devices

Computer Keyboard, Mouse, Trackball, Touch Panel, and Joystick, Light Pen, Scanners, Various types of Monitors, Touch-sensitive screens, Optical Recognition System, Pen based systems, Digitizers, MICR, OCR, OMR, Bar-code Reader, digital camera. Impact and Non-Impact Printers- Daisy Wheel, Dot Matrix, Line Printer, Chain Printer, Comb Printers, Non Impact Printers- DeskJet, Laser Printer, Thermal Transfer Printer, Barcode Printers, Electro static printers and plotters

Unit-III: Windows Operating System Overview

MS-Windows: Operating system-Definition & functions, basics of 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, screen saver and appearance. Using windows accessories.

Unit-IV: Application Software

Documentation Using MS-Word - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features of MS-Word-Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit-V: E-mail & Internet

Some Basic Terminology (www, http, kbps, mbps, server, Email),E-mail Account & Its Functions, Search Engine, Surfing Web Pages, Basics of Social Networking Site & Virus.

Text Books:

1. Computer Fundamentals – B. Ram – New Age International Publishers
2. C.S. French "Data Processing and Information Technology", BPB Publications
3. P.K Sinha `Computer Fundamentals`, BPB Publications

