Scheme and Syllabus

of

B. Sc. (Computer Science) Hons.
I to VI Semester

w.e.f. July 2011
(2011 – 2014 Batch onwards)

Devi Ahilya Vishwavidyalaya,
Indore (M.P.), 452001

(Effective from July 2011 session for 2011-14 batch onwards)
<table>
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<tr>
<th>CLASS /SEMESTER</th>
<th>B. Sc.(CS) Hons.</th>
<th>CCE</th>
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(Effective from July 2011 session for 2011-14 batch onwards)
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PS: CCE ---- CONTINUOUS COMPREHENSIVE EVALUATION, INDIVIDUAL PASSING REQUIRED FOR THEORY AND PRACTICAL SUBJECTS

(Effective from July 2011 session for 2011-14 batch onwards)
CS/IT-2301 DATA STRUCTURE USING C LANGUAGE
Commencing from 2012 onwards

Unit- I

Unit- II
Stack : Definition, Array implementation of stack (static stack) : Operations PUSH, POP, TRAVERSE .Applications of stack : Infix, Prefix , Postfix representation and evaluation using stack, Use of stack in recursive implementation. Queue : Definition, Array implementation of queue (static queue) : Operations INSERT, DELETE, TRAVERSE. Introduction to Circular queue: Definition & implementation, Priority queue, Double ended queue Applications of queue

Unit- III
Introduction to Linked List: Definition, advantages, Types of linked list: single, doubly, circular linked list Operations: Creation, insertion, deletion & traversal of linked list

Unit- IV

Unit- V
Introduction to Tree: Definition, Binary tree: Definition, representation, Operations: Traversal, insertion, deletion Binary search Tree(BST): Definition and creation, Search using BST Introduction to B-Tree & B+ tree. Introduction to graph: Definition & representation, Graph Traversal: Depth First Search (DFS),Breadth First Search(BFS) algorithm.

Text Books:

Reference Books:

(Effective from July 2011 session for 2011-14 batch onwards)
CS/IT 2301P Practical Exercise on Data Structure using C
Commencing from 2012-13 onwards

1. Write a program for address calculation of an element in one and two dimensional array (row major order and column major order).
2. Write a program for insertion, deletion and traversal of elements of an array.
3. Write a program for sparse matrix implementation.
4. Write a program for complete implementation of stack using array with push, pop and traversal operations.
5. Write a program for conversion of an infix expression into postfix representation and evaluation of that postfix form.
6. Write a program for complete implementation of queue using array with insertion, deletion and traversal operations.
7. Write a program for complete implementation of circular queue using array with insertion, deletion and traversal operations.
8. Write a program for complete implementation of double ended queue using array with insertion, deletion and traversal operations.
9. Write a program to create singly link list (creation, insertion, deletion and traversal).
10. Write a program to create doubly link list (creation, insertion, deletion and traversal).
11. Write a program to create circular singly link list (creation, insertion, deletion and traversal).
12. Write a program to create circular doubly link list (creation, insertion, deletion and traversal).
13. Write a program for complete implementation of stack using link list with push, pop and traversal operations.
14. Write a program for complete implementation of queue using link list with insertion, deletion and traversal operations.
15. Write a program for implementation of binary tree (creation, insertion, deletion), with preorder, inorder and postorder traversal.
16. Write a program for implementation of binary search tree (creation, insertion, deletion), with preorder, inorder and postorder traversal.
17. Write a program for implementing graphs and showing depth first search and breadth first search traversals.
18. Write a program for linear search.
19. Write a program for Binary search.
20. Write a program for interpolation search.
21. Write a program for bubble sort.
22. Write a program for selection sort.
23. Write a program for insertion sort.
24. Write a program for merge sort.

(Effective from July 2011 session for 2011-14 batch onwards)
CS – 2302H OPERATING SYSTEM USING LINUX
Commencing from 2012-13 onwards

UNIT-I
Evolution of operating system, Definition of operating system, Objectives & Function of operating system, Operating system as a resource manager, Types of operating systems, features of linux, basic architecture of Linux system, features of kernel and shell. Differentiate DOS, Windows and Linux.

UNIT-II
Structure of file system, Essential Linux commands – Commands for files and directories, creating and viewing files using cat, cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, file comparisons – cmp and comm., view files, disk related commands, checking disk free spaces, chmod with its options, cal, date, who, tty, lp, stty.

UNIT-III
Filters and pipes: head, tail, wc, pr, cut, paste, sort, unique, grep, egrep, fgrep, tee. The process: shell process, parent and children, process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process, mathematical commands – bc, expr, factor, units.

UNIT-IV
Creating and editing files with VI editor with their command options, Operators, Text deletion, Text movement, changing text, yanking text, filtering text, the ex mode, moving text from one file to another. Communication: the bulletin board – news, write, msg, talk, mail, elm, pine, finger, vacation and connecting to the remote machine.

UNIT-V
System administration Common administrative tasks, identifying administrative files – configuration and log files, role of system administrator, managing user accounts – adding and deleting users, changing permissions and ownerships, Installation of Linux system – Linux installation requirement, complete procedure steps, Partitioning the Hard drive, system start up and shut down process, init and run levels. File system mounting, lpsstat. Backup strategies, installing software on Linux.

Text Book:
1. Unix concepts and application – Sumitabha Das – Tata Mcgraw Hill.

Reference Books:

(Effective from July 2011 session for 2011-14 batch onwards)
CS/IT–2401 DATABASE MANAGEMENT SYSTEM
Commencing from 2012-13 onwards

Unit – 1

Unit – 2
Modeling the Real World, Various Data Models & their Comparison, Entity Relationship Models. RDBMS –Concept, Components, Data Integrity, Keys, Relational data Manipulations and Relational Algebra, Tuple Calculus.

Unit – 3

Unit – 4
Introduction to SQL, DDL, DML, and DCL statements, Creating Tables, Adding Constraints, Altering Tables, Update, Insert, Delete & various Form of SELECT- Simple, Using Special Operators for Data Access. Nested Queries & Exposure to Joins, Aggregate Functions.

Unit – 5

Text Book:

References Books:
2. C. J. Date, Database Systems, Prentice Hall of India, New Delhi.

(Effective from July 2011 session for 2011-14 batch onwards)
CS-2402H SYSTEM PROGRAMMING
Commencing from 2012-13 onwards

UNIT I FUNDAMENTALS

UNIT II ASSEMBLERS

UNIT III LOADERS AND LINKERS

UNIT IV MACRO PROCESSORS

UNIT V SYSTEM SOFTWARE TOOLS
Text editors – Overview of the editing process – User interface – Editor Structure Interactive debugging systems – Debugging functions and capabilities Relationship with other parts of the system – User interface criteria.

TEXT BOOK

REFERENCES BOOKS:

(Effective from July 2011 session for 2011-14 batch onwards)
Objective: To introduce the concept of object oriented programming through C++.

UNIT I
Introduction, OOPS languages, characteristics of OOP’s languages, application of OOP’s, OOP’s paradigm, concepts: object, class, data abstraction, data encapsulation, inheritance, and polymorphism. Static and dynamic binding, message passing, benefits of OOP’s, disadvantage of OOP’s. Application of OOP’s.

UNIT II
C++ programming basics, basic program structure, preprocessor directive, data types, operators, manipulator, type conversions, C++ stream class. Control statement: for, do, while, do-while, Decision statement if, if-else, switch-Case. Jump statement: break, continue, go to, exit.

UNIT III
Function and arrays. Classes and instances, defining classes in object oriented language, building and destroying instances (constructors and destructors), modifiers, friend and inline functions, string handling function.

UNIT IV
Data encapsulation, polymorphism, operator overloading, function overloading, virtual functions.

UNIT V
Inheritance, reusability of code through inheritance, type of inheritance, data abstraction, abstract classes. Templates and exception handling.

TEXT BOOK:
1. Object oriented programming with C++ by Balaguruswamy, TMH Publishing

REFERENCE BOOKS:
   DreamTech Press.

(Effective from July 2011 session for 2011-14 batch onwards)
1. Write a program to find the maximum of three using conditional operator.
2. Write a program to find the largest, second largest and third largest in a given array.
3. Write a program to generate Armstrong series.
4. Write a program to find the factorial of a given number.
5. Write a program to generate the Fibonacci series.
6. Write a program to check whether the given number is palindrome or not.
7. Write a program to find the GCD and LCM of two numbers.
8. Write a program to print the diagonal elements of a matrix.
9. Write a program to demonstrate use of array of objects.
10. Program to demonstrate use of function overloading.
11. Write a function which accepts object as a parameter and returns object.
12. Write a program to demonstrate the virtual base class.
13. Write a program to demonstrate use of polymorphism (virtual function).
14. Write a program to overload ++ operator to increment age of person by one month.
15. Write a program to illustrate the use of scope resolution operator.
16. Write a program to find the square root using inline function.
17. Write a program to illustrate the use of friend function.
18. Create two employee objects and display each object’s yearly salary.
19. Give each employee a 10% raise and display each Employee’s yearly salary again.
20. Write C++ program to create five object of book, get information of book using getdata() function including name, price, publication and author.

(Effective from July 2011 session for 2011-14 batch onwards)
CS-3502 H COMPUTER GRAPHICS
Commencing from 2013-14 onwards

UNIT – I
Introduction to computer graphics, application of computer graphics, Hardware and software requirements for computer graphics, Pixel, frame buffer, Resolution, aspect ratio. Types of graphics Display Devices: Video Display Devices: Random Scan, Raster Scan Monitors, Color CRT Monitor, DVST, flat panel and Plasma Panel display devices. Input Devices: mouse, Trackball, Light pen, Scanner, Digital Camera and Hard copy devices: Printers & plotters

UNIT – II

UNIT – III
2D Transformation: Translation, Scaling, Rotation, Reflection, shearing, composite transformation, homogeneous Coordinates. 3-D Transformation: Translation, Scaling, Rotation, Reflection, shearing, composite transformation. 3-D Viewing: Viewing pipeline, Projections: parallel and perspective.

UNIT – IV

UNIT – V
Light and Color, Different color models, RGB, CMY, YIQ, Introduction to multimedia, Computer animation, Raster animation, Computer animation languages.

Text Books:

Reference Books:
CS-3502PH Practical on Computer Graphics  
Commencing from 2013-14 onwards

1. Write program for DDA line Method.
2. Write program for Brasnham’s line drawing Algorithm.
3. Write program for Brasnham’s Circle drawing Algorithm.
4. Write program for drawing a polygon.
5. Write program for Scan – Filling a Polygon.
6. Write program for translation transformation for an object.
7. Write program for rotation transformation for an object.
8. Write program for scaling transformation for an object
9. Write program for Sutherland Hodgeman Polygon Clipping.
10. Write program for Cohen- Sutherland line clipping method and clip a line using this.

(Effective from July 2011 session for 2011-14 batch onwards)
CS-3503H Computer Oriented Numerical Methods
Commencing from 2013-14 onwards

Unit I

Unit II

Unit III

Unit IV

Unit V
Numerical differentiation and Integration: Differentiation based on polynomial fit - Numerical integration using Simpson’s rule and Gaussian quadratic formula - Numerical solution of differential equations of the form dy/dx=f(x,y) using Euler’s method and Runge-Kutta method

Textbook:
1. V. Rajaraman, Computer Oriented Numerical Methods, PHI.

Reference Books:
4. Computer based numerical algorithms by E.V. Krishnamoorthy

(Effective from July 2011 session for 2011-14 batch onwards)
5. Introduction to Numerical Analysis by E. Atkinso

CS-3601 Computer Network
Commencing from 2013-14 onwards

UNIT-I
Computer Network, Goals and Applications, Reference models – OSI and TCP/IP. A Comparative study. Network hardware – LAN, MAN and WAN and topologies, LAN components – File server, Workstations, Network Adapter Cards. Connection Oriented and Connection less services,

UNIT-II
Data communication system, data communication links, character codes, digital data rates, serial data formats, encoded data formats, error detection & correction. Transmission media- guided and unguided media, Switching Techniques – Circuit Switching, Packet Switching, Message Switching.

UNIT-III
Data link protocol, character oriented protocol & bit oriented protocol, network architecture protocols, Ethernet, token bus & token ring.

UNIT-IV
Internet basics: - Elements of the web, viewing web pages with a browser, using a browser for a mail, News and chat, security and privacy issues. Internet: advantage and disadvantage. Internet Services
Web server and proxy server, Web caches, Web browser like Internet Explorer, Netscape Navigator, and Communication Suit, Internet Security issues, Embedded and Software based firewall, Data encryption and Digital Signature and Certificates

UNIT-V
The art of creating the website and home page, The HTML programming basics, Syntax and rules, Tables, Frames, Forms, Example of HTML page, Choice of colour, banners, Linking with HTML page, Div, Span, met tags, span, Introduction to DHTML, JavaScript, Use of JavaScript, JavaScript Syntax, Data type, Variable , Array , Operator and Expressions.

Text Books:
1. Data & Network Communication by Michael A. Miller

Reference Books:

3. Computer Networks – A.S. Tanenbaum

(Effective from July 2011 session for 2011-14 batch onwards)
CS-3601P (Practical Exercise on Computer Network)  
Commencing from 2013-14 onwards

1. Create a webpage that prints your name to the screen.
2. Create a webpage that print the numbers 1 - 10, each number being a different colour.
3. Print a paragraph with 4 - 5 sentences. Each sentence should be a different font.
4. Print two lists with any information you want. One list should be an ordered list, the other list should be an unordered list.
5. Print a paragraph that is a description of a book, include the title of the book as well as its Author. Names and titles should be underlined, adjectives should be italicized and bolded
6. Print some preformatted text of your choosing
7. Create a page with a link at the top of it that when clicked will jump all the way to the bottom of the page. At the bottom of the page there should be a link to jump back to the top of the page
8. Display an image that has a border of size 2, a width of 200, and a height of 200.
9. Display five different images. Skip two lines between each image. Each image should have a title
10. Display an image that when clicked will link to a search engine of your choice
11. Add a simple table to for storing Train information (Train No, Name, Source, Destination, Time) without borders. Do the following
   1. Add border value of 1, save and view.
   2. Add a border value of 5, save and view.
   3. Make the top row a table header, save and view.
   4. Align all data elements to the middle of their cells, save and view.
   5. Divide Time into Departure Time, Arrival Time.
12. Write a JavaScript, which calculate sum or product depending on the drop down menu selection of two numbers, accepted using textbox and display the result in the third textbox. The action performs on click event on button.
13. Write a JavaScript which displays current date and time when page loads.
14. Write a JavaScript that prompts the user for his or her name as the page load (via dialog box) and then welcome the user by name in the body of the page.
15. Create a Webpage using two image files, which switch between one another as mouse pointer mover over the images.
16. Write a JavaScript, which calculate factorial a number, accepted using textbox and display the result in second textbox. The action performs on click event on button.
17. Write a JavaScript which reverse the number accepted in textbox.
18. Create a HTML form that has number of textboxes like First Name, Last Name, Address and Pincode. Write a JavaScript code to verify following on click event of a button:
   1. Pop Up an alert indicating which textbox has left empty and set focus on that specific textbox.
   2. Give message “Thank You” if all text boxes are filled

(Effective from July 2011 session for 2011-14 batch onwards)
3. Pop Up an alert message if text within Pin code is not numeric value and greater than 6 digits and set focus on it till it is given proper value.

CS-3602H COMPUTER ARCHITECTURE
Commencing from 2013-14 onwards

UNIT I
A brief history of Computers. structure and function, Pentium and power evolution, computer components, computer function, interconnection structure, bus interconnection, PCI,

UNIT II
Computer Memory System, Semiconductor main memory, cache memory, advance DRAM organization, Magnetic Disk, Optical memory, Magnetic tap.

UNIT III

UNIT IV
Micro Operations, control of the CPU, Hardwired implementation, Basic Concepts of Micro programmed control, microinstruction sequencing, and microinstruction execution, applications of micro programming

UNIT V
External Devices, I/O modules, Programmed I/O Interrupt-Driven I/O, Direct Memory Access, I/O Channels and processors, parallel processor, RAID, Introduction to Assembly Language.

TEXT BOOK:

REFERENCE BOOK:
1. Computer Architecture and Organisation, Nicholas carter, Schaum Series TMH Adaptation, 2nd Ed. 2010

(Effective from July 2011 session for 2011-14 batch onwards)
CS-3603H Visual Basic .NET
Commencing from 2013-14 onwards

UNIT 1

UNIT-2
The VB.NET Language- Variables -Declaring variables, Data Type of Variables, Arrays, Handling and Using Interfaces, Control flow statements: conditional statement, loop statement. Message box & Input box, Function creation.

UNIT 3

UNIT -4

UNIT 5
Database : Connections, Data adapters, and datasets, Data Reader, Connection to database with server explorer Multiple Table Connection Data binding with controls like Text Boxes, List Boxes, Data grid etc.Navigating data source Data Grid View, Data form wizard Data validation
Connection Objects, Command Objects, Data Adapters, and Dataset Class.

REFERENCE BOOKS
1. Mastering VB.NET by Evangelos petroutsos- BPB publications
2. Introduction to .NET -Worx publication
3. Introduction to .NET –Unleashed

(Effective from July 2011 session for 2011-14 batch onwards)
CS-3603 PH Practical on VB.Net

1. Create a window application for simple Calculator.
2. Create a window application to compare b/w two no, compare b/w 3 no.
3. Create a login form for a user.
4. Create a program with a textbox and one button control to check no is even or odd.
5. Create a program with a textbox and one button control check the year is leap year or not.
6. Create a windows application to calculate simple interest.
7. Create a windows application to calculate factorial of a number.
8. Create a windows application to calculate for storing and displaying 10 numbers in an array.
9. Create a windows application to display your name scrolling using timer.
10. Create a windows application to calculate to generate Fibonacci series.
11. Create a windows application to display same menu as in MS-WORD 2003.
12. Create a windows application to calculate Sum and Average of 10 numbers stored in a array.
13. Create a program to determine whether a given angle forms a valid triangle.
14. Create a program which allow user to select gender using checkbox control.
15. Create a program to change the case of text box according to selected radio button.
16. Create a program to add a record in SQL-SERVER Database.
17. Create a program with a textbox and two button control to set the buttons to open a file and to save a file dialog box.
18. Create a windows application that contains text boxes and a button. The click event of the button displays the percentage of student on the basis of marks entered in the text boxes.

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