UNIVERSITY OF CALICUT

(Abstract)

B.Sc Programme in Computer Science – under Choice based Credit Semester System UG – syllabus of Core, Complementary and Open Courses - revised Syllabus– implemented with effect from 2009 admission onwards – approved – orders issued.

GENERAL & ACADEMIC BRANCH-IV 'J' SECTION

U No. GA IV/J1/4639/10 (i) Dated, Calicut University PO, 13/09/2011

Read: 1. GA 1/J2/3601/08 (Vol II) dtd 19/6/09
2. U.O.No.GAI/J1/2471/06 27.06.09.
3. Minutes of the meeting of Board of Studies in Computer Science & Computer Applications held on 04-06-2011.
4. Orders of the Vice-Chancellor dated 29.08.11 in file of even no.

O R D E R

As per the paper read as (1) above Choice based Credit Semester System and grading was implemented for UG Programmes from 2009-10 academic year onwards.

The Scheme and Syllabus of B.Sc Programme in Computer Science under Choice based Credit Semester System (UG) was implemented as per U.O read as (2) above.

The Board of studies in Computer Science & Applications in its meeting held on 4/6/11 as per item No:1, resolved to approve the revised syllabus of B.Sc. Computer Science Programme of the following Courses .

a) CS1B01- Computer Fundamentals & Programming in C
b) Open Courses (other streams)

The Vice-Chancellor, in view of exigency, exercising the powers of Academic Council has approved the minutes of the meeting of the Board, subject to ratification by the Academic Council.

Sanction has therefore been accorded for implementing the revised syllabi of B.Sc Programme in Computer Science with effect from 2009 admission onwards.

Orders are issued accordingly. Revised Syllabus appended.

Sd/-
DEPUTY REGISTRAR(G&A IV)
For REGISTRAR

To

The Principals of all affiliated Colleges offering
B.Sc Programme in Computer Science

Copy to:

CE/EX section/EG-I/DR-B.Sc/DR III Exam/Tabulation section/ System Administrator (with a request to upload in the University website)/Enquiry/Information Centres/GA I 'F'/ SF/DF/FC

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SECTION OFFICER

UNIVERSITY OF CALICUT

B.Sc. Computer Science Programme

Syllabi for Core, Complementary & Open Courses

Programme Structure

Total Courses: 40

Total Credits: 120

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
I semester	1	A01	Communication Skills in English	4	0	4	3
	2	A02	Critical Reasoning, Writing and Presentation	5	0	5	3
	3	A07	Communication Skill in Languages other than English	5	0	5	4
	4	CS1B01	Computer Fundamentals and Programming in C	2	0	2	3
	5	CS1B02	Programming Language C Lab-I	0	2	2	-
	6	MM1C01	Complementary-I Mathematics	4	0	4	4
	7		Optional Complementary-I Or Optional Complementary-I with Lab	3 2	0 1	3 3	3 3
Total 7 courses 20 Credits						25	20

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
II semester	8	A03	Reading Literature in English	4	0	4	4
	9	A04	Reading on Indian Constitution Secularism and Sustainable Environment	5	0	5	4
	10	A09	Literature in Languages other than English	5	0	5	4
	11	CS2B03	Database System Design & RDBMS	2	0	2	2
	12	CS2B04	Programming Language RDBMS Lab-II	0	2	2	-
	13	MM2C02	Complementary-II Mathematics	4	0	4	3
	14		Optional Complementary-II Or Optional Complementary-II with Lab	3 2	0 1	3 3	3 3
Total 7 courses 20 Credits						25	20

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
III semester	15	A06	History and Philosophy of Science	4	0	4	4
	16	A12	General Informatics	4	0	4	4
	17	CS3B05	Data Structures & Object Oriented Programming using C++	4	0	4	3
	18	CS3B06	Data Structures & C++ Lab-III	0	3	3	-
	19	MM3C03	Complementary-III Mathematics	5	0	5	3
	20		Optional Complementary-III	5	0	5	3

			Or Optional Complementary-III with Lab	3	2	5	3
Total 6 courses 17 Credits						25	17

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
IV semester	21	A13	Basic Numerical Skills	4	0	4	4
	22	A14	Entrepreneurship Development	4	0	4	4
	23	CS4B07	Visual Programming	3	0	3	3
	24	CS4B08	Visual Programming, Data Structures & C++ Lab-IV	0	4	4	2
	25	MM4C04	Complementary-IV Mathematics	5	0	5	3
	26		Optional Complementary-IV Or Optional Complementary-IV with Lab	5 3	0 2	5 5	3 3
Total 6 courses 19 Credits						25	19

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
V semes	27	CS5B09	Programming in Java	3	0	3	4
	28	CS5B10	Web Programming using PHP	4	0	4	4
	29	CS5B11	Software Engineering	3	0	3	4

ter	30	CS5B12	Programming in Java Lab-V	0	5	5	-
	31	CS5B13	Web Programming Lab-VI	0	5	5	-
	32		Open Course-I (Other Streams)	3	0	3	4
	33	CS5B14	Mini Project Work	0	2	2	-
Total 7 courses 16 Credits						25	16

Semester	Course No	Course Code	Course Title	Contact Hours			Credits
				Theory	Lab	Total	
VI semester	34	CS6B15	Microprocessor and Applications	3	0	3	4
	35	CS6B16	Computer Networks	3	0	3	4
	36	CS6B17	Web Programming using ASP.NET	4	0	4	4
	37	CS6B18	Java & Web Programming using PHP Lab-VII	0	5	5	4
	38	CS6B19	Microprocessor & Web Programming using ASP.NET Lab-VIII	0	5	5	4
	39		Choose I Course from List of Elective Courses	3	0	3	4
	40	CS6B24	Project Work	0	2	2	4
Total 7 courses 28 Credits						25	28
Total 40 Courses and 120 Credits							

List of Elective Courses Offered in the Sixth Semester	
Code	Title of Course
CS6B20	Multimedia
CS6B21	Operating System
CS6B22	Hardware Assembly and Troubleshooting

CS6B23	Computer Graphics

Components of internal evaluation (Theory)

	Weightage	Grading
Assignment	1	Graded as A, B, C, D and E depending on quality.
Test paper	2	Graded as A, B, C, D and E
Attendance	1	90% and above: A, 85-89%: B, 80-84%: C, 75-79%: D, Below 75%: E.
Seminar	1	Graded as A, B, C, D and E depending on presentation

Question Paper Scheme

Type of Questions	Question Numbers	Weightage
Twelve objective type questions	1 - 4	1
	5 - 8	1
	9 - 12	1
Nine Short Answer Questions to be answered in one or two sentences	13	1
	14	1
	15	1
	16	1
	17	1
	18	1

	19	1
	20	1
	21	1
Seven Short Essays to be answered in 50 words each. Only five questions (best five) will be considered for weightage.	22	5×2 = 10
	23	
	24	
	25	
	26	
	27	
	28	
Three Long Essays to be answered in 100 words each. Only two questions (best two) will be considered for weightage.	29	2×4 = 8
	30	
	31	
Total Weightage		**30**

Components of internal evaluation (Practical)

	Weightage	Grading
Timely submission of record & Assignment	2	Graded as A, B, C, D and E
Test paper	2	Graded as A, B, C, D and E
Attendance	1	90% and above: A, 85-89%: B, 80-84%: C,

		75-79%: D, Below 75%: E.

Question Paper Scheme (Practical)

Semester IV (CS4B08) - One question each from Data structure using C++ & VB.Net.

Weightage 5 each

Total Weightage- 5+5=10

Semester VI – Practical I (CS6B18) - One question each from Java & PHP

Practical II (CS6B19) - One question each from Microprocessor & ASP.NET

Weightage 5 each

Total Weightage- 5+5=10

	Weightage	Grading

Record	1	Graded as A, B, C, D and E
Flow chart/User interface/Class Diagram	1	Graded as A, B, C, D and E
Coding	2	Graded as A, B, C, D and E
Output	1	Graded as A, B, C, D and E

Total Weightage 5 + 5= 10

Project Evaluation (CS6B24) - Graded as A, B, C, D and E depending on quality & presentation

CS1B01 - Computer Fundamentals and Programming in C

Course Number: 4
Contact Hours: 2 T + 0 L
Number of Credits: 3
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with fundamental principles of operations of various units of computer and to impart them with basic principles and concepts of computer programming

Objectives of the Course

- To learn the basics of computer hardware components
- To learn the basics of computer hardware units and how they work together
- To learn the concept of programming
- To study C language

Prerequisites

Background of the basic science at +2 level

Course Outline

Module I – 12 Hrs (Chapter 1, 2 of Text 1)

Digital Logic Circuits:- Digital computer, Logic gates, Boolean algebra, Map simplification – POS simplification, Don't care condition, Combinational circuits – Half-Adder, Full-Adder, Flip-Flops – SR , D, JK, T, and Edge-Triggered Flip-Flop, Excitation Tables, Sequential circuits. Digital Components:- Integrated circuits, Decoders, Multiplexers, Shift registers, Binary counters, Memory unit – RAM, ROM, ROM types.

Module II – 12 Hrs (Chapter 3, 8, 12 of Text1)

Data Representation: - Number systems, Decimal representation, Alphanumeric representation, Complements, Subtraction of unsigned numbers, Fixed-Point representation, Floating-Point representation, Other Binary codes, Error-Detection codes. Central Processing Unit:- General Register Organization, Stack Organization, Instruction formats, Addressing modes, CISC and RISC architecture (basic idea and characteristics only), Memory Organization:- Memory Hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory.

Module III – 12 Hrs (Chapter 2, 3, 4, 5 of Text2)

Algorithms and Flowcharting concepts, Constants, Variables and Data Types:- Character set, C tokens, Keywords and identifiers, Constants, Variables, Data types, Declaration of variables, Declaration of storage class, Assigning values to variables, Defining symbolic constants. Operators and Expressions:- Arithmetic, Relational, Logical, Assignment, Increment, Decrement, Conditional, Bitwise, Comma and sizeof operators, Arithmetic expressions, Type conversions in expressions, Operator precedence and associativity. Managing Input and Output Operations:- Reading and Writing a character, Formatted input and output. Decision making And Branching:- Decision making with if statement, Simple if statement, The if...else statement, Nesting of if...else statements, The elseif ladder, The switch statement, The ?: operator, The goto statement.

Module IV – 12 Hrs (Chapters 6, 7, 8, 9 of Text2)

Decision making and Looping:- while, do and for statements, break, continue. Arrays:- One-dimensional arrays declaration, initialization, Two-dimensional arrays,

Initialization, Multidimensional arrays. Character arrays and strings:- Declaring and initializing string variables, Reading and Writing strings, Arithmetic operations on characters, String handling functions. User-defined functions:- it's Need, Elements of user-defined functions, Definition of functions, Return values and their types, Function calls, Function declaration, Category of functions, Nesting of functions, Recursion, Passing arrays to functions.

Module V – 12 Hrs (Chapter 10, 11, 12 of Text2)

Structures and Unions:- Defining a structure, Declaring structure variables, Accessing structure members, Structure initialization, Operations on individual members, Arrays of structures, Structures within structures, Unions, Pointers:- Accessing the address of a variable, Declaring pointer variables, Accessing a variable through its pointer, Pointer expressions, Pointer increments and scale factor, Pointers and Arrays, Arrays of pointers, Pointers as function arguments

Text Books:

1 M. Morris Mano, "Computer System Architecture", Pearson Education Third edition.
2 E. Balagurusamy, "Programming in ANSI C", Tata Mc Graw Hill , 4th Edition

Reference Books:

1. P.V.S Rao, Computer System Architecture, PHI, 2009
2. Byran Gotfried, Schaums Outline series- "*Programming with C"*

CS1B02 – Programming Language C Lab-I

Course Number: 5
Contact Hours: 0 T + 2 L
Number of Credits: 0
Number of Contact Hours: 30 Hrs

Aim of the Course

To equip the students with fundamental programming principles

Objectives of the Course

- To learn the concept of programming
- To study C language

Prerequisites

Basic programming concepts

Course Outline

Programming in C

1. Programs involving no transfer of control
2. Programs involving if, if…else, else if ladder, switch, ?: and goto statement
3. Programs involving while, do…while, for, break and continue statements
4. Programs involving one and two dimensional arrays
5. Programs involving functions, recursions, arguments as arrays, strings
6. Programs involving structures, arrays of structures, structure within structure
7. Programs involving pointers, pointers and arrays, pointers and strings, pointer arguments to functions, return value as pointer, pointers and structures
8. Programs involving files, command line arguments

CS2B03 - Database System Design & RDBMS

Course Number: 11
Contact Hours: 2 T + 0 L
Number of Credits: 2
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with principles and concepts of database design

Objectives of the Course

- To learn the basic principles of database and database design
- To learn the basics of RDBMS
- To learn the concepts of database manipulation SQL
- To study PL/SQL language

Prerequisites

Basic knowledge of the computer functional units and their functioning and basic programming knowledge

Course Outline

Module I – 12 Hrs

Introduction: Purpose of database systems, View of data- Data abstraction, Instances and Schemas, data models. Database languages, Database administrator, database users, database architecture. The entity-relationship model- Entity sets, Relationship sets, Attributes. Constraints- Mapping cardinalities, Keys, ER diagrams,

Weak entity sets, Strong entity sets.

Module II – 12 Hrs

Relational Database Design: 1st, 2nd, 3rd, BCNF, 4th, 5th Normal forms. Transactions - Properties (ACID), States, Concurrent executions. Concurrency control-lock-based protocols - Locks.

Module III – 12 Hrs

Data Definition in SQL: Data types, creation, Insertion, viewing, updation, deletion of tables, modifying the structure of tables, renaming, dropping of tables. Data constraints- I/O constraints- Primary key, foreign key, Unique key constraints. Business rule constraints- Null, not null, check integrity constraints, Defining different constraints on table, ALTER TABLE Command.

Module IV – 12 Hrs

Database Manipulation in SQL: Computations done on table data - Select command, Logical operators, Range searching, Pattern matching, Grouping data from tables in SQL, GROUP BY, HAVING clauses, Joins - Joining Multiple Tables, Joining a Table to itself. Views - Creation, Renaming the column of a view, destroys view. Granting and revoking permissions - Granting privileges, Object privileges, Revoking privileges.

Module V – 12 Hrs

Program with PL/SQL – data types – Using set and select commands-procedural flow-if-if/else-while-goto-global variables - Security- Locks, types of locks, levels of locks. Cursors- working with cursors- Error handling-developing stored procedures- create, alter and drop- passing and returning data to stored procedures-using stored procedures within queries- building user defined functions—creating and calling a scalar function-implementing triggers-creating triggers - multiple trigger interaction.

Core Reference:

1. Database System Concepts Abraham Silberschatz, Henry F Korth, S. Sudarshan, 5th Ed.
2. Ivan Bayross, SQL, PL/SQL The programming Language of Oracle.
3. Alex Kriegel and Boris M. Trukhnov, SQL Bible, Wiley pubs.
4. Paul Nielsen, Microsoft SQL Server 2000 Bible, Wiley dreamtech India pubs.

Course Number: 12
Contact Hours: 0 T + 2 L
Number of Credits: 0
Number of Contact Hours: 30 Hrs

Aim of the Course

To equip the students with fundamental programming principles

Objectives of the Course

- To learn the concept of SQL programming
- To study SQL commands and procedures

Prerequisites

Basic programming concepts

Course Outline

SQL Commands and Procedures

CS3B05 - Data Structures & Object Oriented Programming Using C++

Course Number: 17
Contact Hours: 4 T + 0 L
Number of Credits: 3
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with principles and concepts of object oriented design

Objectives of the Course

- To learn the basic concepts and principles of object oriented design
- To study C++ language

Prerequisites

Basic programming knowledge

Course Outline

Module I – 12 Hrs

OOP Concepts: Introduction: Characteristics of OOP **C++ Fundamentals:** C++ data

types, Operators, Expressions, Type conversion, iostream library, Control statements, Functions: Prototype, Arguments passing, Return type, Default arguments, Inline functions, Function overloading **Classes:** Classes and Objects, Defining classes, Creating objects, Defining member function, Static class members, Friend functions, Passing and returning objects to and from functions, Nesting of classes Constructors: Default constructors, Parameterized constructors, Constructor overloading, Constructors with default arguments, Copy constructors - Destructors,

Module II– 12 Hrs

Pointers: Dynamic memory management, new and delete operators, Pointers to objects, Pointers to object members, Accessing members, this pointer, Operator overloading: Overloading unary and binary operators, Type conversion: Between objects and basic types and between objects of different classes, **Inheritance:** Single Inheritance, Overriding base class members, Abstract classes, Constructors and destructors in derived classes, Multilevel inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual functions, Virtual base class, File processing: Opening and closing files, File pointers, File stream functions, Creating and processing text and binary files

Module III– 12 Hrs

Program Performance: Space complexity, Time complexity, Asymptotic notations, Contiguous data structures - Arrays: Structure of arrays, Representation of arrays, Operations on one dimensional arrays, Overloading operators for one-dimensional arrays, Polynomials using one-dimensional arrays, Multidimensional arrays, String representation and manipulation **Non Contiguous Data Structures:** Lists: Representation and Traversing of linked list, Operations with linked list, Doubly linked list, Circular list, Header linked list, Sparse matrices: Array representation and Linked representation of Sparse matrices

Module IV – 12 Hrs

Contiguous Data Structures: Stacks: Definition, Operation on stack, Implementation using arrays and linked lists, Evaluation of arithmetic expressions, Queues: Definition, Implementations using arrays and linked lists, Circular queue, Dequeues, Priority queues, Applications of queues **Trees and Graphs:** Basic terminology, Binary trees, Properties of binary tree, Traversal application, Representation of binary trees, Sequential representation of binary trees, Linked representation of binary trees, BST: Definition, Insertion, Deletion, Traversal and Searching BST, Threaded binary tree, Heap tree: Insertion and deletion,

Module V– 12 Hrs

Graphs: Representation of graphs, Graph search methods (BFS and DFS), Shortest path problems **Searching and Sorting:** Searching: Linear search, Binary search, Comparison of different methods, Sorting: Insertion, Bubble, Selection, Quick, Heap, Merge sort methods, Comparisons, Hashing: Different hashing functions, Methods for collision handling

Core Reference :

1 E. Balagurusamy, Object Oriented Programming in C++, TMH

2 Sartaj Shani, "*Data Structures, Algorithms and Applications in C++"*

References:

1 Bjarne Stroustrup, "*The C++ Programming Language*", Addison Wesley, 1999.

2 Aron M Tenenbaum, "*Data Structure Using C and C++*"

CS3B06 – Data Structures & C++ Lab-III

Course Number: 18
Contact Hours: 0 T + 3 L
Number of Credits: 0
Number of Contact Hours: 50 Hrs

Aim of the Course

To develop the basic programming skills

Objectives of the Course

- To learn the implementation of various data structures

Prerequisites

Basic programming knowledge in C and C++

Course Outline

Experiments should include but not limited to :

- Implementation of array operations:

- Stacks and Queues : adding, deleting elements
- Circular Queue : Adding & deleting
- Implementation of linked lists: inserting, deleting, inverting a linked list.
- Implementation of stacks & queues using linked lists
- Implementation Polynomial addition, Polynomial multiplication using linked lists
- Implementation Sparse Matrices using linked lists: Multiplication, addition.
- Implementation of trees and graphs
- Recursive and Non-recursive traversal of Trees
- Threaded binary tree traversal.
- Implementation of searching & sorting techniques.

CS4B07 – Visual Programming

Course Number: 23
Contact Hours: 3 T + 0 L
Number of Credits: 3
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with principles of various visual programming environment

Objectives of the Course

- To learn the basic principles of visual programming
- To study VB.Net language

Prerequisites

Basic programming knowledge

Course Outline

Module I – 12 Hrs

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 Environment. Forms- properties, events. The Visual Basic Language- Console application and windows application, Data types ,Declaring Variables, scope of variables, operators and statements.

Module II – 12 Hrs

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.

Module III – 12 Hrs

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

Module IV – 12 Hrs

Object-Oriented Programming - Creating and using Classes & objects - Handling Exceptions- *On Error GoTo*- Raising an Exception- Throwing an Exception- Using Structured Exception Handling – Debugging and tracing

Module V – 12 Hrs

Data Access with ADO.NET- Accessing Data with the Server Explorer- Accessing Data with Data Adaptors and Datasets- Creating a New Data Connection- Creating and populating Dataset- Displaying Data in a Data Grid- Selecting a Data Provider- Data Access Using Data Adapter Controls- Binding Data to Controls- Handling Databases in Code – Binding to XML data

Core Reference:

1. Visual Basic .NET Black Book, by Steven Holzner

References:

1. VB.NET for developers, By Keith Franklin, Rebecca Riordan, SAMS.
2. Sams Teach Yourself Visual Studio .NET 2005 in 21 Days, By Jason Beres
3. Learning Visual Basic .NET by Jesse Liberty
4. Visual Basic .Net programming in easy steps BY TIM ANDERSON, DreamTech Press

CS4B08 – Visual Programming, Data structures & C++ Lab-IV

Course Number: 24
Contact Hours: 0 T + 4 L
Number of Credits: 2
Number of Contact Hours: 60 Hrs

Aim of the Course

To develop the basic programming skills

Objectives of the Course

- To learn the basic programming skill .Net environment
- To learn the implementation of various data structures

Prerequisites

Basic programming knowledge in C, C++ and VB.Net

Course Outline

Module I: Data Structure Using C++ – 30 Hrs

Experiments should include but not limited to :

- Implementation of array operations:
- Stacks and Queues : adding, deleting elements
- Circular Queue : Adding & deleting
- Implementation of linked lists: inserting, deleting, inverting a linked list.
- Implementation of stacks & queues using linked lists
- Implementation Polynomial addition, Polynomial multiplication using linked lists
- Implementation Sparse Matrices using linked lists: Multiplication, addition.
- Implementation of trees and graphs
- Recursive and Non-recursive traversal of Trees
- Threaded binary tree traversal.
- Implementation of searching & sorting techniques.

Module II: Programming in VB.Net – 30 Hrs

CS5B09 – Programming in Java

Course Number: 27
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in Java

Objectives of the Course

- To learn the core Java language

Prerequisites

Basic programming knowledge in C and C++

Course Outline

Module I – 12 Hrs

Introduction to Java: Features of Java, Data types, variables and arrays, constants, operators, control statements. Introducing classes. String handling. Java I/O classes and interfaces

Module II – 12 Hrs

Inheritance basics. Using super, multi level hierarchy, abstract and final classes, object class. Packages, access protection, importing packages. Interfaces. Exception handling and java built-in exceptions. Java thread model. Creating a thread, suspending, resuming and stopping a thread

Module III – 12 Hrs

HTML basics. Two types of applets, applet basics, applet classes, applet skeleton, applet initialization and termination, simple applet display method, passing parameters to applets. Event classes, event listeners. AWT classes, window fundamentals, creating frame window and handling events, working with graphics, working with colour, working with fonts, understanding layout managers, menu bars and menus, dialog boxes. Introduction to swing, a simple swing application.

Module IV – 12 Hrs

Introduction to JDBC, JDBC and ODBC, Establishing connection, getting data from table, storing data to table, prepared statements, callable statements, stored procedures, database metadata, resultset metadata. Java servlets, benefits, anatomy of java servlet, reading from client, reading HTTP request headers, sending data to client and writing the HTTP response header, working with cookies, tracking sessions.

Module V – 12 Hrs

Enterprise Java Beans, deployment descriptors, environment elements, security elements, Query element, assembly elements, session java bean, message driven

bean. Remote Method Invocation concept, server side, client side.

Core Reference books

1. Java Complete Reference, Herbert Schildt, Tata McGraw hill edition.
2. J2EE Complete Reference, Jim Keogh, Tata McGraw hill edition.
3. Java Enterprise in a nutshell, David Flanagan, Jim Farley, William Crawford & Kris Mangnusson, O'Reilly

CS5B10 – Web Programming using PHP

Course Number: 28
Contact Hours: 4 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in Web Designing

Objectives of the Course

- To learn the Web Designing

Prerequisites

Basic knowledge in HTML

Course Outline

Module I – 12 Hrs

HTML: Introduction to HTML, Basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Different attributes like align, color, bgcolor, font face, border, size. Navigation Links using anchor tag: internal, external, mail and image links.Lists: ordered, unordered and definition, Table tag, HTML Form controls: form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, Frameset and frames

Module II – 12 Hrs

Javascript: Introduction, Client side programming, script tag, comments, variables, Document Methods: write and writeln methods, alert, Operators: Arithmetic, Assignment, Relational, Logical, Javascript Functions, Conditional Statements, Loops,

break and continue. Events Familiarization: onLoad, onClick, onBlur, onSubmit, onChange

Module III – 12 Hrs

PHP: Introduction to PHP, Server side scripting, Role of Web Server software, including files, comments, variables and scope, echo and print, Operators: Logical, Comparison and Conditional operators, Branching statements, Loops, break and continue, PHP functions.

Module IV– 12 Hrs

Working with PHP: Passing information between pages, HTTP GET and POST method, String functions: strlen, strops, strstr, strcmp, substr, str_replace, string case, Array constructs: array(),list() and foreach(), PHP advanced functions: Header , Session, Cookie Object Oriented Programming using PHP: class, object, constructor, destructor and inheritance

Module V – 12 Hrs

PHP & MySQL: Features of MySQL, data types, Introduction to SQL commands-SELECT, DELETE, UPDATE, INSERT, PHP functions for MySQL operations: mysql_connect, mysql_select_db, mysql_query, mysql_fetch_row, mysql_fetch_array, mysql_fetch_object, mysql_result, Insertion and Deletion of data using PHP, Displaying data from MYSQL in webpage

Core Reference:

1. Jon Duckett, *Web Programming with HTML,XHTML*, CSS, Wrox Beginning
2. Jim Converse & Joyce Park, *PHP & MySQL Bible*, Wiley

Reference Books

1. HTML 4.0 IN SIMPLE STEPS Author : Kogent Solutions Publishers : Wiley
2. HTML 4 FOR DUMMIES Author : ED TITTEL & MARY BURMEISTER Publishers: Wiley
3. Beginning PHP D W Mercer,A Kent,S D Nowicki Publisher:Wrox
4. PHP & MYSQL FOR DUMMIES, 3RD ED Author : JANET VALADE Publishers: Wiley

CS5B11 – Software Engineering

Course Number: 29
Contact Hours: 3 T + 0 L
Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic system development skills

Objectives of the Course

- To learn the basic concepts of SE

Prerequisites

Basic programming knowledge

Course Outline

Module I – 12 Hrs

Software - Characteristics, Classification, Myths, Crisis, Software Engineering: Definition , Comparison with other disciplines , Ethics & professional practice , Phases in Software Engineering, Challenges, Software Process, Project, Product - Components of Software process ,process framework, process assessment , Software Life Cycle Models , Selection criteria, Process change management , Quantitative process management

Module II – 12 Hrs

Software Requirements – Definition, Types, Requirement Engineering process, Feasibility Study - Types of feasibilities , Process Requirements Elicitation - techniques, Requirements Analysis – Structured Analysis, Object Oriented Modeling, Other approaches, Requirements Specification – Structure of SRS, Requirements Validation , Requirements Management – A Case study

Module III – 12 Hrs

Software Design – basic principles, concepts , Data design , Data Architectural design, Component level design , User Interface design ,Pattern based Software design, Design Notations, Design Reviews – types, process, evaluating reviews, Software Design Documentation, A Case study, Software Coding – features, guidelines, Methodology, Programming practices, Verification techniques, documentation

Module IV – 12 Hrs

Software Testing - basics, guidelines, characteristics, Test Plan – steps in development, Software testing strategies, V Model of Software testing, Levels of Software testing – Unit, Integration, System, Acceptance, Testing Techniques (basic idea of black box and white box testing), Object Oriented testing, Debugging, Software test report, Software Maintenance – basics, Legacy Systems, factors affecting maintenance, types of maintenance, Life cycle, Models, Techniques

Module V – 12 Hrs

Software Planning and Scheduling – project planning, planning process, project plan, Project Scheduling – principles, techniques, Project staffing, Risk management, Software Quality – Concepts, Quality Assurance Activities, Software reviews, Evaluation, Capability Maturity Model , Software Reliability, Software Configuration Management process, Concept of Software Re Engineering – approaches, process models

Core Reference:

1. Software Engineering Principles And Practices By Rohit, Khurana, Vikas Publishing House Pvt. Ltd.

Reference Book:

1. Software Engineering A Practitioners Approach By ROGER S, Pressman 5th Edition Mcgraw Hill International Edition
2. Rajib Mall, Fundamentals of Software Engineering, PHI

CS5B12 – Programming in Java Lab-V

Course Number: 30
Contact Hours: 0 T + 5 L
Number of Credits: 0
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in Java

Objectives of the Course

- To learn the core Java language

Prerequisites

Basic programming knowledge in C and C++

Programs list

1. Largest among three numbers
2. Reverse of a number
3. Fibonacci series with in a range
4. Generate n prime numbers
5. Strange nos up to a limit
6. Calculate the distance between 2 points
7. Calculate the sum of two complex numbers and display it using a class
8. Find the area of a rectangle and square using method overloading
9. Illustrate single level inheritance
10. Illustrate multiple inheritance using interface
11. String sorting
12. Illustrate thread
13. Create Three thread priorities
14. Package
15. Exception handling(user-defined)
16. Abstract class
17. Method overriding
18. Receive username and password as parameters and display it in applet
19. Create an applet for a moving ball using thread
20. Create an AWT application for a simple calculator
21. Frame application to Illustrate the window events
22. Swing application
23. Create a JDBC application to add the details of a student into a table
24. Display the details of the student with a particular course

CS5B13 – Web Programming Lab-VI

Course Number: 31
Contact Hours: 0 T + 5 L
Number of Credits: 0
Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in web programming

Objectives of the Course

- To learn PHP

Prerequisites

Basic programming knowledge in web programming

Course Outline

Open Course-I (Other Streams)

Course Number: 32

Contact Hours: 3 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

CS5B14 – Mini Project Work

Course Number: 33

Contact Hours: 0 T + 2 L

Number of Credits: 0

Number of Contact Hours: 30 Hrs

Aim of the Course

To equip the students with Computer Applications

Objectives of the Course

- To learn the basic industrial application

Prerequisites

Basic programming knowledge

Course Outline

Mini Project in any platform using any language of student's choice

CS6B15 – Microprocessor and Applications

Course Number: 34

Contact Hours: 3 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with the architecture and instruction sets of different microprocessors and to design systems using microprocessors.

Objectives of the Course

- To study the architecture of microprocessors like 8085, 8086 and higher versions
- To understand the instruction set of the above.
- To know the methods of connecting them to the peripheral devices. To learn the basic concepts and functions of operating system

Prerequisites

Basic programming knowledge

Course Outline

Module I – 12 Hrs

8-Bit Microprocessor: 8085 Architecture and Memory interfacing, interfacing I/O devices, Instruction set, stack, subroutine, Addressing Modes, Assembly language programming, counters and time delays, interrupts, timing diagram. Microprocessor applications

Module II – 12 Hrs

16-Bit Microprocessor: 8086 Architecture, Pin Configuration, 8086 Minimum and Maximum mode configurations, Addressing modes, 8086 Instruction set (Data transfer, Arithmetic, Branch, Processor control & String instruction), 8086 interrupts.

Module III – 12 Hrs

Assembler Directives: Data Definition And Storage Allocation – Program Organization- Alignment – Program End- Value Returning Attribute – Procedure Definition- Macro Definition – Data Control – Branch Displacement- Header File Inclusion-Target Machine Code Generation Control Directives.

Module III – 12 Hrs

Peripherals and Interfacing: Interfacing output displays (8212), interfacing input keyboards, key Debounce, Programmable communication interface (8251A), programmable peripheral interface (8255), Programmable DMA Controller (8257), Programmable interrupt controller (8259), Programmable interval timer (8253).

Module III – 12 Hrs

Advanced Microprocessors: Introduction to 80186, 80286, 80386, 80486 and Pentium processors, General introduction to BIOS and DOS interrupts.

Core Reference:

1. Ramesh S. Gaonkar, Microprocessor Architecture Programming and Applications with 8085. Fourth edition, Penram International Publishing 2000.
2. K.R. Venugopal, Raj Kumar ,Microprocessor X86 programming, Bpb publications New Delhi

References:

1. B Ram, Fundamentals of Microprocessors and Microcomputers - Dhanpat Rai Publications Pvt. Ltd., New Delhi
2. Mohamad Rafiquzzaman, Microprocessors and Microcomputer Based System Designing. – Universal Bookstall, New Delhi
3. Yu. Cheng Liu, Glenn A Gibson, Microcomputer Systems: The 8086/8088 Family. Architecture, Programming & Designing – Prentice Hall of India Pvt. Ltd., New Delhi
4. Barry.B.Brey. "The Intel Microprocessor 8086/8088. 80186, 80286, 80386 and 80486 Architecture Programming and Interfacing", Prentice Hall of India Pvt.Ltd.1995.
5. Ray A.K.Bhurchandi.K.M, "Advanced Microprocessor and Peripherals", Tata McGraw-Hill, 2002.
6. Abel P, IBM PC Assembly Language & Programming – 5th Edition – Parson Education Asia 2001

CS6B16 – Computer Networks

Course Number: 35

Contact Hours: 3 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with Computer Networks

Objectives of the Course

- To learn the Network concepts

Prerequisites

Basic knowledge in Networks

Course Outline

Module I – 12 Hrs

Introduction to Networking, Uses of Computer Networks, Network Hardware, ISO OSI Reference Model, Transmission Media - Magnetic Media, Twisted Pair, Coaxial Cable, Fibre Optics, Wireless Transmission - Radio Transmission, Microwave Transmission, Satellites. PSTN - Structure of Telephone System, Trunks and Multiplexing, Switching, Mobile Telephone System-GSM, CDMA

Module II– 12 Hrs

Datalink layer Design Issues- Framing Error Detection and Correction, Data link Protocols-Unrestricted Simplex Protocol, Simplex Stop-and- Wait Protocol. One Bit Sliding Window Protocol Medium access control Sublayer, Bluetooth

Module III – 12 Hrs

The Network layer Virtual Vs Datagram Routing Algorithms-Shortest path Flooding Distance Vector etc, Congestion Control Algorithms Internetworking

Module IV– 12 Hrs

Transport Layer Connection Establishment Connection Release Flow control and Buffering ,Multiplexing Crash Recovery Remote Procedure Call,Internet Transport Protocols: TCP, TCP Service Model TCP Protocol

Module V – 12 Hrs

Application Layer-The domain Name System,DNS namespace ,Name Servers,Email Architecture and services The User agent Sending and Reading Email WWW-Architectural overview Client side Server side URL Cookies Multimedia Introduction to Digital audio - Audio Compression Video Compression Cryptography (Basic concepts)

Core Reference:

1. Computer Networks – Andrew .S. Tanenbaum Pearson Edu Asia Fourth edition

Reference:

1. Brijendra Singh, Data Communications and Computer Networks, PHI, 2nd Ed, 2007

CS6B17 – Web Programming using ASP.NET

Course Number: 36

Contact Hours: 4 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in web programming

Objectives of the Course

- To learn ASP.NET

Prerequisites

Basic programming knowledge in web programming

Course Outline

Module I – 12 Hrs

Overview of ASP.NET framework, Understanding ASP.NET Controls, Applications, Web servers, installation of IIS, Web forms, web form controls - server controls, client controls, web, forms & HTML, Adding controls to a web form,Buttons, Text Box, Labels,

Checkbox, Radio Buttons, List Box, etc, Running a web Application, creating a multiform web project

Module II – 12 Hrs

Form Validation: Client side validation, server Side validation, Validation Controls: Required Field Comparison Range. Calendar, control, Ad rotator Control, Internet Explorer Control, State management- View state, Session state, Application state

Module III – 12 Hrs

Architecture of ADO.NET, Connected and Disconnected Database, Create Connection using ADO.NET Object Model, Connection Class, Command Class,

Module IV– 12 Hrs

Data Adapter Class, Dataset Class. Display data on, data bound Controls and Data Grid, Database Accessing on web applications: Data Binding concept with, web, creating data grid, Binding standard web server controls, Display data on web form using Data bound controls

Module V– 12 Hrs

Writing datasets to XML, Reading datasets with XML, Web services: Introduction, Remote method call using XML, SOAP, web service description language, building & consuming a web, service, Web Application deployment

Core Reference

1. ASP.NET Unleashed, C# programming – Wrox publication,

CS6B18 – Java & Web Programming Using PHP Lab - VII

Course Number: 37

Contact Hours: 0T + 5 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with basic programming skill in Java

To equip the students with basic programming skill in web programming

Objectives of the Course

- To learn the core Java language
- To learn PHP

Prerequisites

Basic programming knowledge

Course Outline

CS6B19 – Microprocessor & Web Programming using ASP.NET Lab-VIII

Course Number: 38

Contact Hours: 0 T + 5 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Aim of the Course

To equip the students with the architecture and instruction sets of different microprocessors and to design systems using microprocessors.

To equip the students with basic programming skill in web programming

Objectives of the Course

- To study the architecture of microprocessors like 8085, 8086 and higher versions
- To understand the instruction set of the above.
- To know the methods of connecting them to the peripheral devices. To learn the basic concepts and functions of operating system

- To learn ASP.NET

Prerequisites

Basic programming knowledge

Basic programming knowledge in web programming

Course Outline

Choose one Course from list of Elective Courses

Course Number: 39

Contact Hours: 3 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

CS6B24 – Project Work

Course Number: 40

Contact Hours: 0 T + 2 L

Number of Credits: 4

Number of Contact Hours: 40 Hrs

Aim of the Course

To equip the students with Computer Application

Objectives of the Course

- To learn real world projects

Prerequisites

Advanced programming knowledge

Course Outline

Major Project in any platform using any language of student's choice

SYLLABUS OF ELECTIVE COURSES

CS6B20 – Multimedia

Course Number: 39

Contact Hours: 3 T + 0 L

Number of Credits: 4

Course Outline

Module I – 12 Hrs

Multimedia Basics: Multimedia: Definition, Multimedia Developers, Multimedia Project, Multimedia Highway - Multimedia Applications: Business, Schools, Home, Public Places, Virtual Reality - Stages of Multimedia Project: Planning & Costing, Designing & Producing, Testing, Delivering - Multimedia Hardware: Macintosh Platform, Windows Platform, Networking Mac & Windows Computers - Connections: SCSI, IDE, USB, Firmware (IEEE 1394). Memory & Storage Devices: RAM, ROM, Floppy & Hard Disks, Zip, Jaz, SyQuest Drives, Optical storage Devices, CD, DVD - Input Devices: Keyboard, Mouse, Trackball, Touch Screen, Magnetic Card Encoders and Readers, Graphics Tablets, Scanners, OCR, Infrared Remotes, Voice Recognition Systems, Digital Cameras - Output Hardware: Audio Devices, Amplifiers & Speakers, Monitors, Video Devices, Projectors, Printers - Communication Devices: Modems, ISDN & DSL, Cable Modems - Basic Software Tools: Text Editing and Word Processing Tools, OCR Software, Painting and Drawing Tools, 3-D Modeling and Animation Tools. Image Editing Tools, Sound Editing Tools - Animation, Video and Digital Movie Tools – Video Formats, Quick time for Windows & Macintosh, Microsoft Video for Windows, Movie Editors, Compressing Movie files - Multimedia Authoring Tools – Multimedia Authoring, Authoring Software - Types – Card or Page based Tools, Icon based Event-driven Tools, Time based Tools - Cross-Platform Authoring.

Module II – 12 Hrs

Text & Sound for Multimedia: Text:- Fonts, Faces, Cases - Text in Multimedia - Designing with Text, Choosing Text Fonts, Symbols & Icons - Font Editing & Design Tools - Fontographer, Making Pretty Text - Hyper Media & Hyper Text - Sound: Definition, Acoustic Signals, Amplitude, Frequency, Sampling Rate, Quantization, Multimedia System Sounds - Digital Audio – Digital Audio files, File size versus Quality, Setting proper Recording levels - Editing Digital Recordings – Multiple Tracks, Trimming. Splicing and Assembly, Volume Adjustments, Format Conversion, Resampling or Downsampling, Fade-in & Fade-out, Equalization, Time Strecting, Digital Signal Processing(DSP), Reversing Sounds - MIDI, Audio File Formats, MIDI versus Digital Audio, Sound for WWW, Adding Sound to Multimedia Project, Red Book Standard.

Module III – 12 Hrs

Graphics & Animation: Images & Graphics: Introduction - Making Still Images – Bitmaps, Clipart, Bitmap Software - Capturing & Editing Images – Scanning Images, Vector Drawing - Vector Graphics versus Bitmaps, Conversion between bitmaps & Drawn Images, 3D Drawing & Rendering - Color:– Natural Light & Color - Computerized Color – Additive Color, Subtractive Color, Monitors, Computer Color Models - Color Palettes, Dithering - Image File Formats – Macintosh, Windows, Cross-Platform - Animation: Definition, Principles of Animation, Animation by Computer - Animation Techniques – Cel Animation, Computer Animation, Kinematics, Morphing, Animation File Formats.

Module IV– 12 Hrs

Analog & Digital Video: Video:- Understanding how Video Works - Broadcast Video Standards – NTSC, PAL, SECAM, ATSC DTV, HDTV - Analog Video – Overscan and Safe Title Area, Video Color, Interlacing Effects, Text & Titles for Television - Digital Video – Digital Video Architectures, Digital Video Compression (MPEG 1, 2, 4, 7, 21) - Video Recording & Tape Formats – Composite Analog Video, Component Analog Video (S-Video, Three Channel Component – RGB, YUV, Chrominance, Luminance) - Composite Digital, Component Digital, ATSC – Digital TV, Comparison of Formats - Shooting & Editig Video – Shooting Platform, Lighting, Chroma Keys, Composition, Optimizing Video Files for CD-ROM.

Module V – 12 Hrs

Designing & Delivering Multimedia: Designing Multimedia:- Structure, Navigation, Hotspots, Hyperlinks, Buttons, Icons - Designing the user Interface – Expert Modes, GUIs, Graphical Approaches, Audio Interfaces - A Multimedia Design Case History, Producing Multimedia - Delivering Multimedia – Testing, Alpha Testing, Beta Testing, Polishing to Gold - CD Technology, CD Standards (Red, Yellow, Green & Orange Book Standards), White Book, DVD.

Textbook:

1. Multimedia: Making It Work – Tay Vaughan (TATA McGRAW-HILL)

References:

1. Multimedia: Computing Communications & Applications – Ralf Steinmetz and Klara Nahrstedt, Pearson Education
2. Multimedia BASICS – Weixel, Fulton, Barksdale, Morse, Thomson Brooks/Cole – ESWAR Press

3. Multimedia & Web Design – Vikas Gupta, Dreamtech Press
4. Adobe Premiere Pro Bible – Droblas, Greenberg , Wiley – India
5. Digital Multimedia – Chapman & Chapman, Wiley – Dreamtech
6. Fundamentals of Multimedia – ZeNinan Li, Mark Drew, Pearson – PrenticeHall

CS6B21 – Operating System

Course Number: 39

Contact Hours: 3 T + 0 L

Number of Credits: 4

Number of Contact Hours: 60 Hrs

Course Outline

Module I – 12 Hrs

Operating System Objectives and functions-The Evolution of Operating Systems-Serial Processing-Simple batch Systems-Multi Programmed batch Systems-Time Sharing Systems.

Module II – 12 Hrs

Definition of Process-Process States-Process Control Block-Operations on Process-Process Communication-Communication in Client-server System- Basic concepts of threads - Concurrency-Principles of Concurrency-Mutual exclusion - Semaphores – Messages – Deadlock - Deadlock Prevention - Deadlock detection - deadlock avoidance

Module III – 12 Hrs

Memory Management-Address binding-Logical Vs Physical address space-Dynamic Loading-Dynamic Linking and Shared Libraries-Overlays-Swapping-Contiguous Memory allocation-Paging-Segmentation-Virtual memory-Demand paging-Page replacement-Thrashing.

Module IV – 12 Hrs

CPU Scheduling - Scheduling Criteria-Scheduling algorithms – FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization-The Critical Section Problem-Synchronization Hardware-Classical Problems of synchronization, File and Database

System-File System-Functions of organization-Allocation and Free space management.

Module V – 12 Hrs

Modern Operating Systems-Architecture and Features, Case Studies-Linux –Windows Network OS - Windows XP (Design principles and components only)

Textbook:-

1. "Operating System Concepts"-Silberschatz, Galvin, Gagne-Sixth edition –Sixth Edition-John Willey & Sons INC

Reference book:-

"Operating Systems, Internals and Design Principles"-William Stallings-Fifth Edition-PHI Publications New Delhi

CS6B22 – Hardware Assembly and Troubleshooting

Course Number: 39
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs
Course Outline

Module I – 12 Hrs

Fundamental of Computer: Block diagram and brief introduction of each block- Types of computers. **Personal/ Micro Computers:** Main Parts: CPU Box, Monitor, & Peripherals [Keyboard, Mouse, Speaker] (A Brief introduction). Inside CPU Box: Motherboard, I/O Cards, Cables, Floppy Drivers, HDD, CD-Drive, SMPS (Brief introduction of each, with their function).

Module II – 12 Hrs

Mother Board In Detail: Nomenclature, technology, standards AMD CPUs, Cyrix CPUs CPUs: CPU over clocking, troubleshooting, CPU problems - Chip Sets: AMD chip sets, Intel chip sets, VIA chip sets SIS chip sets, OPTI chipsets, Legacy and support ICS - Mother Boards: PC-XT-AT, and above (like 80286, 80386, 80486 and Pentium) The expansion Bus: (Page 297-34 Hardware bible)

Module III – 12 Hrs

Memory: Basic Concept - Binary Cell, Semiconductor memory. Types of Memory - RAM and ROM in detail - Memory Chips: RAM and ROM EPROM etc. Memory Modules and packaging - Logical and Physical organization of memory in computer. Cache Memory - LX and LZ, EDO - Various terms used in computer memory.

Module IV – 12 Hrs

PC-Assembly And CMOS Setup and Troubleshooting: Observation of all parts of Floppy drives, HDD, CD, and SMPS. Identification of cables and computers - Mounting Motherboard in cabinet Installation of cards, devices and then connecting cables - Fitting of cabinet. CMOS - Setup Troubleshooting.

Module V – 12 Hrs

Basic of Printers: Types of printers and printing mechanism, how printer works - Inject printer, working of laser printer, Fonts/Type faces - Trouble shooting printers.

Text Books:

1. Hardware bible By : Winn L Rosch, Techmedia publications
2. Trouble shooting, maintaining and repairing PCs By
3. Stephon J Bigelow Tata McGraw Hill Publication
4. Modern All about printers By : Manohar Lotia, Pradeep

Reference Books:

1. The complete PC upgrade and maintenance guide by Mark Minasi, BPB Publications.

CS6B23 – COMPUTER GRAPHICS

Course Number: 39
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs
Course Outline

Module I – 12 Hrs

Overview of Graphic Systems – Display Devices – hard copy Devices – Interactive Input Devices – Display Processor – Graphic software – Output Primitives – Line Drawing Algorithms – Initializing Lines – Line command – fill areas – circle Generation Algorithms.

Module II – 12 Hrs

Attributes of output primitives – line style – colour and Intensity – area filling algorithms – character Attributes – inquiry functions – bundled attributes – two dimensional transformations – basic and composite transformations – metric representations.

Module III – 12 Hrs

Windowing and Clipping – Windowing concepts – Clipping Algorithms – Window to view port Transformations – segments – Interactive input methods – Physical input devices – logical classification of input devices – interactive picture construction techniques – input functions.

Module IV – 12 Hrs

Three dimensional concepts – 3D Display Techniques – 3D representation – polygon and curved surface – 3D transformations.

Module V – 12 Hrs

3D viewing – projections – viewing transformation – Implementation of viewing operations – Hidden surface and Hidden Line removal – back free removal, depth buffer and scan line methods – shading.

Textbook:

1. "Computer Graphics" – Donald Hearn and M.Pualine Baker, PHI, 1997, 3rd Edition.
2. Computer Graphics – Desai – Prentice Hall of India

Reference Book:

"Principles of Interactive computer Graphics" – William M.Neuman and Robert F Sproul - McGraw Hill International

CHOICE BASED CREDIT SEMESTER SYSTEM (CCSS UG)

Complementary Course - Computer Science

SYLLABUS - Science Stream

Sem	Course No	Course	Course Code	Course Title	Contact Hours			Credits		
					Theory	Practical	Total	Theory	Practical	Total
I	6	Complementary Course I	CS1C01	Computer Fundamentals & Application Packages	2	2	4	2	0	2
II	13	Complementary Course II	CS2C02	Programming in C	2	2	4	2	0	2
III	19	Complementary Course III	CS3C03	Fundamentals of System Software, Networks & DBMS	3	2	5	2	0	2
IV	25	Complementary Course IV Complementary Course V	CS4C04 CS4C05	Visual Programming Programming Lab	3	2	5	2	4	6

Semester-I

Course Code – CS1C01
Course Title- Computer Fundamentals & Application Packages
Credits-2
Prerequisite- Plus two level knowledge
Hours for Theory/Week-2 Hrs
Hours for Practical-2Hrs
Total Working Hours-64 Hrs (Theory- 34 Hrs, Practical 30 Hrs)

Unit I -6Hrs

Number systems- Non-positional number systems and positional number systems (Binary, Octal and Hexadecimal), Converting from one number system to another- decimal to a new base, converting to decimal from another bases, converting from base other than ten to base other than ten, short cut method for converting from binary to octal, octal to binary, binary to hexadecimal and hexadecimal to binary, Computer Codes (BCD, EBCDIC, ASCII) error detecting and correcting codes, parity bit, Hamming Code, computer arithmetic ,importance of binary, binary addition and subtraction.

Unit II –8 Hrs

Boolean Algebra and Logic circuits- fundamental concepts of Boolean Algebra, postulates, Principle of duality, theorems of Boolean Algebra, Boolean functions, minimization, complement, canonicals forms, conversion between canonical forms. Logic Gates- AND, OR, NOT, NAND, NOR, XOR and XNOR, logic circuits, converting expression to logic circuit, universal NAND and NOR gates, Exclusive OR and equivalence functions, Design of Combinational circuits (Half Adder, Subtractor and Full Adder)

Unit III –7 Hrs

Basic Computer Organization-Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU organization, Control Unit (micro programmed and hardwired control), primary storage, memory hierarchy, storage locations and addresses, storage capacity, bit, byte, nibble, RAM, ROM, PROM and EPROM, cache memory, registers. Secondary storage devices (Magnetic tape, Hard disk and CD drive)

Unit IV –7 Hrs

I/O devices- Input Devices-identification and its use, keyboard, pointing devices (mouse, touch pad and track ball), Video digitizer, remote control, joystick, magnetic stripes, scanner, digital camera, microphone, sensor, and MIDI instruments, Output Devices- identification and its use, monitor, printer (laser, ink jet, dot-matrix), plotter, speaker, control devices (lights, buzzers, robotic arms, and motors)

Unit V –6 Hrs

Planning a Computer program- purpose of program planning, algorithm, flowchart- symbols, sample flowcharts, advantages and limitations

Text book

1. Computer Fundamentals by P.K Sinha

Reference books

1. An introduction to Digital Computer design by V. Rajaraman and T. Radhakrishnan
2. Computer fundamentals by B. Ram

SI LAB

PRACTICAL LIST

MS WORD

1. Paragraph formatting
2. Newspaper style Document
3. Table creation
4. Mail merge
5. Page formatting & printing

MS EXCEL

1. Worksheet including Formulas
2. Formatting cells
3. Chart creation
4. Functions

MS POWERPOINT

1. Creating presentation
2. Animations
3. Sound
4. Inserting picture

Semester-II

Course Code – CS2C02
Course Title- Programming in C
Credits-2
Prerequisite- Knowledge in Algorithms and Flowcharts
Hours for Theory/Week-2 Hrs
Hours for Practical-2Hrs
Total Working Hours-64 Hrs (Theory- 32 Hrs, Practical 32 Hrs)

Unit I -6Hrs

Introduction to C- Structure of C program, Character Set, Keywords, Identifiers, Data Types, Qualifiers, Variables, Declarations, Symbolic Constants, Expressions, Statements, Different Types of Operators (Arithmetic, Logical, Relational & Equality, Unary and Conditional), Operator Precedence and Associativity, Library Functions, Comments, I/O functions-(Formatted scanf() & printf() , getchar (), putchar (), getche(), gets(), puts())

Unit II- 7 Hrs

Control Statements- Selection Statements (if, if-else, else if ladder, switch), iteration (while, do while, for), jumping (goto, break, continue), Nested Control Statements

Unit III- 6 Hrs

Structured Data types- Arrays (One dimensional and Two Dimensional), Character and String Functions, Structure (Definition, Processing-period Operator), Union

Unit IV- 7 Hrs

User defined Functions- Advantages, Definition, Accessing functions, formal and Actual Parameters, Recursion, Storage Classes- Automatic, External, Static and Register Variable, Argument Passing Mechanism

Unit V- 6 Hrs

Pointers and data files- Pointers, advantages, declaration, operations on pointers, pointers and one dimensional arrays, dynamic memory allocation. Data files (sequential), file handling functions (fopen (), fclose (), fputc (), fgetc (), fgets (0, fputs (), fscanf (), fprintf ()

Text Book

1. Programming in ANSI C by E. Balaguruswamy

Reference Books

1. Programming in C by C. Karthikeyan
2. Programming with C - Schaum Series

S2 LAB

PRACTICAL LIST (C Programs)

1. Prime nos
2. nFibonacci numbers
3. Factorial using recursion
4. Simple calculator
5. Solving quadratic equation
6. Armstrong numbers
7. String palindrome
8. Sorting nos and names
9. Matrix transpose
10. Matrix multiplication
11. Trace of a matrix

12. Sum of the digits and reverse
13. Sin series
14. Cosine series
15. First n Even no and odd numbers in a range
16. Vowels in a string
17. LCM and HCF of 2 nos
18. No of positives, negatives and zeros in a set of numbers
19. Base conversion
20. Appending array

Semester-III

Course Code – CS3C03
Course Title - Fundamentals of System Software, Networks & DBMS
Credits-2
Prerequisite- Knowledge in Computer Organization & Basic Console Operations
Hours for Theory/Week-3 Hrs
Hours for Practical-2Hrs
Total Working Hours-80 Hrs (Theory- 48 Hrs, Practical 32 Hrs)

Unit I -9Hrs

System software – classification of programming languages (Machine, assembly & High level), Characteristics and Comparison, language processors (Assembler, Interpreter and Compiler), Operating Systems-Functions, types of OS (batch, multiprogramming, time sharing, real time and distributed)

Unit II -10Hrs

Computer networks- goals of networking, network topologies, types of networks (LAN, MAN and WAN), network model, OSI model- 7 layers, Internet Layer- 5 layers, Communication Media-Guided (Twisted Pair, Coaxial Cable and Fiber Optic) and Unguided (microwave, satellite)

Unit III –10 Hrs

Database Management Systems-definition, structure of Database, data models (Record based Data model, Network model: - Basic Components, Record types, data types, links, relationships, Hierarchical model and Relational model)

Unit IV -9Hrs

Structured query language-Create, insert, select, update, delete, alter, drop

Unit V -10Hrs

HTML-hyper text, hyper media, understanding basic HTML tools- HTML editor, web browser, General structure of HTML document, different types of elements-doc type, comment element, structural element, HTML tags and attributes- <HTML>,<BODY>,<HEAD>,<TITLE>, <H1>, <H2>,……,<H6> , <BR>, <TABLE>, <IMG>, <HR>, adding links, background image to the body, creating lists

Reference Books

1. Fundamentals of Computers by P. K Sinha
2. OS A concept based Approach by D.M Dhamdhere
3. Data Communication & Networking by Behrouz A Forouzan Fourth Edn MC Graw Hill
4. Principles of web page design by Joel Sklar, Vikas publications

S3 LAB
PRACTICAL LIST

HTML

1. Simple HTML document creation
2. Table creation
3. List creation

MYSQL

1. Database creation
2. Data retrieval
3. Insertion and deletion
4. Alteration of a table

Semester-IV

Course Code – CS4C04
Course Title – Visual Programming
Credits-2
Prerequisite- Knowledge in Programming language
Hours for Theory/Week-3 Hrs
Hours for Practical-2Hrs
Total Working Hours-80 Hrs, (Theory- 48 Hrs, Practical 32 Hrs)

Unit I- 10 Hrs

Introduction to visual Programming -Concept of event driven programming, introduction to VB.Net, The .Net Frame work and Common language runtime, Building VB. Net Application, VB IDE, forms, properties, events, VB language-console application and

windows application, data type, declaring variable, scope of variable, operators and statements

Unit II- 9 Hrs

Control Statements- if-then, if –then- else, else-if ladder, select case, choose, loop statements- do loops, for, while-The with statement, converting between data types, Handling dates and times. Arrays-declaration and manipulation, Strings and String functions, procedures and functions

Unit III- 9 Hrs

Windows Applications-forms, adding controls to forms, handling events, MsgBox, Input Box, multiple forms, handling mouse and Keyboard events, object oriented programming-creating and using classes and objects, Handling Exceptions- on Error Goto

Unit IV- 10 Hrs

Common controls- textbox, Rich textbox, label, command Button, option button, checkbox, frame, list box, combo box, scrollbar, picture box, image box, timer, Data control, OLE, file controls-properties and methods

Unit V- 10 Hrs

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

Text Book

1. Visual Basic. NET Black Book, by Steven Holzner

Reference Books

1. Visual Basic. NET for developer, by Keith Franklin, Rebecca Riordan, SAMS.
2. Sams teach yourself Visual studio, Net 2005 in 21 days by Jason Beres
3. Learning Visual Basic. Net by Jesse Liberty
4. Visual Basic. Net programming in easy steps by Tim Anderson, Dreamtech Press

S4 LAB

PRACTICAL LIST

1. Program to display odd nos & even nos up to a given number
2. Program to accept an amount in rupees and to calculate and display the number of currency notes for each denomination 1000,500,100,50,20,10,5,2,1
3. Program to calculate electricity bill
4. Program to print prime numbers in a range
5. Program to print n Fibonacci numbers
6. Program to check whether the given number is Armstrong or not
7. Program to check whether the given string is palindrome or not
8. Program to display n numbers in ascending order
9. Program to illustrate Checkbox
10. Program to illustrate Radio button
11. Program to illustrate list box
12. Program to illustrate rich textbox
13. Program to illustrate group box
14. Program to illustrate picture box
15. Program to illustrate image list
16. Program to illustrate dropdown list (combo box)
17. Program to Illustrate color dialog, font dialog, and open file dialog
18. Program to Illustrate timer
19. Program to Illustrate Scrollbar
20. Program to Illustrate Menu strip
21. Program to read and print the details of n students using class and objects
22. ADO.net connectivity to read details from a table
23. Program to Insert, delete & update to a table by ADO.net

Practical record

Minimum of 3 exercises each from MS word, MS Excel, MS PowerPoint, HTML & MYSQL.

20 C Programs & 15 VB.NET applications

Practical

Course Code – CS4C05

Course Title – Programming in C and VB.NET

Credits - 4

Practical External Examination - One question each from Programming in C & VB.Net.

Practical Internal Evaluation – Exercises from MS word, MS Excel, MS PowerPoint, HTML & MYSQL.

EVALUATION

The evaluation scheme for each course shall contain two parts: (i) internal evaluation

(ii) External evaluation. 25% weight shall be given to internal evaluation and 75% weight for external evaluation.

Components of internal evaluation (Theory)

	Weightage	Grading
Assignment	1	Graded as A, B, C, D and E depending on quality.
Test paper	2	Graded as A, B, C, D and E
Attendance	1	90% and above: A, 85-89%: B, 80-84%: C, 75-79%: D, Below 75%: E.
Seminar	1	Graded as A, B, C, D and E depending on presentation

Components of internal evaluation (Practical)

	Weightage	Grading
Timely submission of record & Assignment	2	Graded as A, B, C, D and E
Test paper	2	Graded as A, B, C, D and E
Attendance	1	90% and above: A, 85-89%: B, 80-84%: C, 75-79%: D, Below 75%: E.

Question Paper Scheme (Theory)

Type of questions	Question Nos	Weightage
Twelve objective type questions	1 - 4	1
	5 - 8	1
	9 - 12	1
Nine Short Answer Questions to be answered in one or two sentences	13 - 21	9 x 1 = 9
Seven Short Essays to be answered in 50 words each. Only five questions (best five) will be considered for weightage.	22 - 28	5 x 2 = 10
Three Long Essays to be answered in 100 words each. Only two questions (best two) will be considered for weightage.	29 - 31	2 x 4 = 8

Total Weightage - 30

Question Paper Scheme (Practical)

One question each from Programming in C & VB.Net.

Weightage 5 each

	Weightage	Grading
Flow chart/User interface	1	Graded as A, B, C, D and E
Coding	2	Graded as A, B, C, D and E
Output	2	Graded as A, B, C, D and E

Total Weightage 5 + 5= 10

CHOICE BASED CREDIT SEMESTER SYSTEM (CCSS UG)

Open Course for other Streams

SYLLABUS

List of Open Courses (For Other Streams)	
Code	Title of Course
CS5D01	Web Designing
CS5D02	Computer Fundamentals
CS5D03	Introduction to Computers & Office Automation

CS5D01 – Web Designing

Course Number: 32
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs

Course Outline

Module I – HTML

Introduction – history of html,sgml - structure of html document, web page layout, html tags and types - font type, paragraph formatting, meta data, blockquote, hyperlinks, linking, comments, white space, horizontal ruler, images, ordered and unordered lists, frames, tables, forms

Module II – DHTML

Introduction, DHTML technologies, elements of DHTML, document object model, events – window events, form events, keyboard events, mouse events, style sheets, properties used in style sheets – background properties, positioning properties

Module III – javascript

Introduction and advantages pf javascript, java script syntax, writing javascript in html, javascript operators, arrays and expressions, programming contructs – for .. in loop, while loop – dialog boxes and prompts – alert, prompt, confirm methods – functions – built-in functions and userdefined functions, scope of variables, handling events, using event handlers and event methods, form object, properties, methods, form element's properties and methods

Module IV – frontpage

Introduction, advantages of frontpage, creating, opening, saving a web page, building forms, formatting and aligning text and paragraph, adding lists, styles and themes, linking pages, working with images, frames

Module V – web fundamentals

History of internet, basic services, search engines, e- mail, WWW, web browsers, web servers – IIS, apache - protocols- HTTP, FTP, telnet – uses of internet

References:-

Internet and World Wide Web – H.M.Dietel - Pearson

CS5D02 – Computer Fundamentals

Course Number: 32
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs
Unit I – 8 Hrs

Computer basic, Generation, Characteristics, Simple Computer model – Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU Organization, Control Unit , primary Storage, Memory Hierarchy, Storage Locations and Addresses, Storage Capacity, Bit, Byte, Nibble, RAM, ROM, PROM and EPROM, Cache Memory, Registers, Secondary Storage Devices (Magnetic tape, Hard disk and CD drive).

Unit II – 10 Hrs

System software – Classification of Programming Languages (Machine, Assembly and High Level), Characteristics and Comparison, Language processors (Assembler, Interpreter and Compiler), Operating Systems – Structure of Operating System, Bootstrapping, POST, Functions of Operating Systems, Types of Operating Systems(Batch, Multiprogramming, Time Sharing, Real Time and Distributed), Examples of Operating Systems(DOS, Windows,Linx, Unix).

Unit III – 12 Hrs

Networks – Goals of networks, Network Topologies, Types of Networks(LAN, MAN and WAN), Network Model, OSI Model, Connectors(Repeaters,Hubs,Bridges, Switches, Routers and Gateways), Communication Media – Guided (Twisted Pair, Coaxial cable and Fiber Optics) and Unguided(Microwave, Satellite), Internet – Goals of Internet, WWW, Web Browser, Web Server, Webpage, Components of Webpage(HTML, HTTP), DNS, IP Address, Application of Internet , Search Engine –Definition, Software, types of Search Engine.

Unit IV – 12 Hrs

Computer Graphic – Introduction, Acquisition of Textual Data and Pictures, Storage Formats for Pictures, Image Compression Fundamentals, Basics of Audio and Video Signal Acquiring and Storing of Audio Signals, Compression of Audio Signal and MPEG Compression Standard of Video Data, Display Devices – Video Display Devices(CRT, TFT), Flat Panel Display(LED, LCD).

Unit V – 6 Hrs

Computer Threats – Introduction, Viruses, Spam, Cookies, Adware, Spyware, Malware, Hackers, Trojan Horses, Security – Antivirus, Firewall.

References

1. Computer networks by Andrews tanenbaum pub: Pearson
2. Computer system architecture by Moris mano pub:PHI
3. Information technology by V.Rajaraman : pub. PHI
4. Information technology in action by Aalen enans :pub. Pearson
5. Operating system concepts by Siberschat,galvin
6. Computer graphics by Donald hearn

CS5D03 – Introduction to Computers & Office Automation

Course Number: 32
Contact Hours: 3 T + 0 L
Number of Credits: 4
Number of Contact Hours: 60 Hrs

Module I (7 Hours)

Introduction to Computers-Types of Computers- DeskTop, Laptop, Notebook and Netbook – Hardware: CPU, Input / Output Devices, Storage Devices–System – Software - Operating Systems, Programming Languages, Application Software – Networks - LAN,WAN -Client-Server.

Module II(13 Hours)

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.

Module III(10 Hours)

Electronic Spread Sheet using MS-Excel - Introduction to MS-Excel, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions,

Charts, Advance features of MS-Excel-Pivot table & Pivot Chart, Linking and Consolidation.

Module IV(10 Hours)

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.

Module V(10 Hours)

Internet - History of Internet – Intranet and Extranet – DNS – Connections-Dial-up, ISDN, DSL, T1, T3,WiFi,Wireless, and Satellite

Communications--E-mail, Chat, Forum, Blog, and Newsgroups – Browsers – Search Engines.

References:

1. Absolute Beginner's Guide to Computer Basics, Michael Miller, Prentice Hall.

2. Learn Microsoft Office – Russell A. Stultz–BPB Publication
3. Internet & World Wide Web – How to program, H.M.Deitel, P.J.Deitel, et al., Prentice Hall.