

# UNIVERSITY OF CALICUT

(Abstract)

B.Sc. Programme in Computer Science - under Choice based Credit Semester System - Scheme and Syllabus - implemented with effect from 2009 admission onwards - approved - Orders issued.

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## GENERAL AND ACADEMIC BRANCH - I 'J' SECTION

No. GA I/J1/2471/06

Dated, Calicut University. P.O., 27.06.2009.

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- Read: 1. U.O.No.GAI/J2/3601/08 Vol.II dated 19.06.2009.  
2. Minutes of the meeting of the Board of Studies in Computer Science and Applications held on 02.05.2009.  
3. Item No.2(xxii) of the minutes of the meeting of Faculty of Science held on 05.05.2009.  
4. Item No.II-A-23 of the minutes of meeting of the Academic Council of 14.05.2009.

### **ORDER**

Choice Based Credit Semester System and Grading has been introduced for UG curriculum in all affiliated colleges under this University with effect from 2009 admission onwards and the Regulations for the same implemented vide paper cited 1<sup>st</sup> above.

As per paper read as (2) above, the Board of Studies has resolved to approve the scheme and Syllabus of B.Sc. Programme in Computer Science under Choice based Credit Semester System.

As per paper read as (3) & (4) above, the Faculty of Science at its meeting held on 05.05.2009 endorsed the minutes of Board of Studies and the Academic Council held on 14.05.2009 approved the same.

Sanction has therefore been accorded to implement the Scheme and Syllabus of B.Sc. Programme in Computer Science under Choice based Credit Semester System in the University with effect from 2009 admission onwards.

Orders are issued accordingly. Scheme and Syllabus appended.

Sd/-  
**DEPUTY REGISTRAR (G&A I)**  
**For REGISTRAR.**

To

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

Copy to: C.E, EX Sn, EGI, DR, B.Sc  
System Administrator (with a request to  
upload in University website), Tabulation Sn.,  
Enquiry/G&A-I F.Sn./SF/DF/FC.

Forwarded/By Order



**SECTION OFFICER**



# UNIVERSITY OF CALICUT

## B.Sc Computer Science Programme

### Syllabi for Core/Open Courses

#### Programme Structure

Total Courses: 40

Total Credits: 120

S e m e s t e r	Co u r s e N o	Course Code	Course Title	Contact Hours			Credi ts
				Th e o r y	La b	T o t a l	
I S e m e s t e r	1	CS1A01	Communication Skills in English	4	0	4	3
	2	CS1A02	Critical Reasoning, Writing And Presentation	5	0	5	3
	3	CS1A07	Communication skill in languages other than English	5	0	5	4
	4	CS1B01	Computer Fundamentals & Programming in C	3	0	3	3
	5	CS1B02	Programming Language C Lab-I	0	2	2	--
	6	CS1C01	complementary- 1	3	0	3	4
	7	CS1C02	Optional Complementary-I	3	0	3	3
			or optional complimentary with lab	2	1	3	3
<b>Total (7 Courses)</b>						<b>25</b>	<b>20</b>

II S e m e s t e r	8	CS2A03	Reading Literature In English	4	0	4	4
	9	CS2A04	Reading on Indian constitution secularism and sustainable environment	5	0	5	4
	10	CS2A09	Literature in Languages other than English	5	0	5	4
	11	CS2B03	Database System Design & RDBMS	3	0	3	2
	12	CS2B04	Programming Language RDBMS Lab-II	0	2	2	--
	13	CS2C03	complementary - II	3	0	3	3
	14	CS2C04	Optional Complimentary II or Optional complimentary with lab	3 2	0 1	3 3	3 3
<b>Total (7 Courses)</b>						<b>25</b>	<b>20</b>
III S e m e s t e r	15	CS3A06	History And Philosophy of science	5	0	5	4
	16	CS3A12	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	CS3C05	complementary - III	4	0	4	3

	20	CS3C06	Optional Complimentary – III	5	0	5	3
			or Optional Complimentary with Lab	3	2	5	3
<b>Total (6 Courses)</b>						<b>25</b>	<b>17</b>
IV S e m e s t e r	21	CS4A13	Basic Numerical Skills	4	0	4	4
	22	CS4A14	Entrepreneurship Development	4	0	4	4
	23	CS4B07	Visual Programming	3	0	3	3
	24	CS4B08	Visual Programming ,Data Structures&C++ Laboratory - IV	0	4	4	2
	25	CS4C07	complimentary - IV	5	0	5	3
	26	CS4C08	Optional Complimentary – IV	5	0	5	3
			or Optional Complimentary-IV	3	2	5	3
<b>Total (6 Courses)</b>						<b>25</b>	<b>19</b>
V S e m e s t e r	27	CS5B09	Programming in Java	3	0	3	4
	28	CS5B10	Web Programming using PHP	3	0	3	4
	29	CS5B11	Software Engineering	3	0	3	4
	30	CS5B12	Programming in Java Lab-V	0	5	5	--

	31	CS5B13	Web Programming Lab-VI	0	5	5	--
	32	CS5D01	Open Course – I ( Other Streams)	4	-	4	4
	33	CS5B14	Mini Project Work	0	2	2	–
	<b>Total (7 Courses)</b>					<b>25</b>	<b>16</b>
<b>VI S e m e s t e r</b>	34	CS6B15	Microprocessor and Applications	3	0	3	3
	35	CS6B16	Computer Networks	3	0	3	3
	36	CS6B17	Web Programming using ASP.NET	3	0	3	3
	37	CS6B18	Microprocessor Lab - VII	0	5	5	7
	38	CS6B19	Web Programming using.NET Lab -VIII	0	6	6	8
	39	CS6B20E1	Choose 1 Course from Open Course - II	3	0	3	2
	40	CS6B20	Project Work	0	2	2	2
	<b>Total (7 Courses)</b>					<b>25</b>	<b>28</b>
<b>Total 40 Courses and 120 Credits</b>							
<b>Open Course - I</b>							
CS5D1A – Digital Electronics CS5D1B– Operations Research CS5D1C– Basic Psychology CS5DD– Accounting and Financial Management							
<b>Open Course - II</b>							
CS6D2A – Multimedia							

CS6D2B– Operating System

CS6D2C– Hardware Assembly and Troubleshooting

CS6D2D– Computer Graphics

**Question Paper Scheme**

Type of Questions	Question Numbers	Weightage
Twenty multiple choice objective questions (4 choices for each question)	1 - 4	1
	5 - 8	1
	9 - 12	1
	13 - 16	1
	17 - 20	1
Six Short Answer Questions to be answered in one or two sentences	21	1
	22	1
	23	1
	24	1
	25	1
	26	1
Six Short Essays to be answered in 50 words each. Only four questions (best four) will be considered for weightage.	27	4×2 = 8
	28	
	29	
	30	
	31	
	32	
Three Long Essays to be answered in 100 words each. Only two questions (best two) will be considered for weightage.	33	2×4 = 8
	34	
	35	
<b>Total Weightage</b>		<b>27</b>

## CS1B01 - Computer Fundamentals & Programming in C

**Course Number: 4**

**Contact Hours: 3T**

**Number of Credits: 2**

**Number of Contact Hours: 50 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 –

Programming principles-algorithms.Flow charts,Truth tables.time and space complexity analysis of algorithms.Variable types,operatrs-precedence of evaluation.

#### Module II –

control flow-If statement,If-Else and Else-If constructs,nested If statements, swithch statements, looping, for loops, nested loops,While-do and Do-While loops; Break and Continue statements.

#### Module III –

Functions: Arguments and local variables, declaration,return values,global variables;auto,static and register variables; recursive functions,structures and unions,typedef statement, data type conversions. Typecasting character strings,string functions, escape characters.

#### Module IV –

Pointers: pointers and structures, pointers and functions, pointers and arrays, operations on pointers. Input and output character I/O, formatted I/O, print and scan functions, file I/O; fopen, fclose and feof functions; stdin, stdout and stderr.

#### Module V –

The preprocessors: #define, #include, #if, #undef, etc., commandline arguments; dynamic memory allocation; sizeof operator. Elementary graphics; subroutines to draw geometrical shapes, functions to fill and shade images.

#### Reference:

- 1 . *Programming in ANSIC*, by F.Balagurusamy
- 2 . *Programming in C*, by S.G.Kochen
- 3 . *C Language Reference*, by Kernigham and Ritchie.

## **CS1B02 - Programming in C**

**Course Number:05**

**Contact Hours: 2 L**

**Number of Credits: 2**

**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**

##### **Module I – 30 Hrs**

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 and RDBMS

**Course Number: 11**

**Contact Hours: 3T**

**Number of Credits: 2**

**Number of Contact Hours: 50 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 – 10 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 – 10 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 – 10 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 – 10 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 – 10 Hrs

Program with 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, 5<sup>th</sup> 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.

**CS2B04 – RDBMS Lab****Course Number: 12****Contact Hours: 0 T + 2 L****Number of Credits: 2****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
- To study SQL commands and procedures

**Prerequisites**

Basic programming concepts

**Course Outline****Module I– 30 Hrs**

SQL Commands and Procedures

**CS3B05 - Data Structures & Object Oriented Programming Using C<sup>++</sup>****Course Number: 17****Contact Hours: 4 T****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, Filestream 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 Graps:** 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 Balagurusamy, Object Oriented Programming in C++, TMH
2. raj Shani, "Data Structures, Algorithms and Applications in C++"

### References:

Bjarne Stroustrup, "*The C++ Programming Language*", Addison Wesley, 1999.  
Aron M Tenenbaum, "*Data Structure Using C and C++*"

## **CS1B06 – Data structures & C++ Lab**

**Course Number:06**

**Contact Hours: 3 L**

**Number of Credits: 3**

**Number of Contact Hours: 30 Hrs**

### **Aim of the Course**

To equip the students with fundamental of Datastructure and C++ programming principles

### **Objectives of the Course**

- To learn the concept of C++ programming

### **Prerequisites**

Basic programming concepts

## **CS4CB07 – Visual Programming**

**Course Number: 23**

**Contact Hours: 3 T**

**Number of Credits: 3**

**Number of Contact Hours: 50 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 – 10 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 – 10 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 – 10 Hrs**

Windows Applications-Forms- Adding Controls to Forms, Handling Events, *MsgBox* , *InputDialog* , 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 – 10 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 – 10 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
- 2.

#### **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 – Programming Laboratory - 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 I: Programming in VB.Net – 30 Hrs

## CS5B09 – Programming Java

**Course Number: 27**

**Contact Hours: 3 T**

**Number of Credits: 4**

**Number of Contact Hours: 50 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
- To learn
- To learn

## Prerequisites

Basic programming knowledge in C and C++

## Course Outline

### Module I – 10 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 – 10 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 – 10 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 – 10 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 – 10 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: 3 T**

**Number of Credits: 4**

**Number of Contact Hours: 50 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 – 10 Hrs**

**HTML:** Introduction to HTML, Basic formatting tags: heading, paragraph, underline break, bold, italic, underline, superecript, 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 – 10 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 – 10 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– 10 Hrs**

**Working with PHP:** Passing information between pages, HTTP GET and POST method, String functions: strlen, stripslashes, strpos, 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 – 10 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**

**Number of Credits: 4**



**Number of Contact Hours: 50 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
- To learn the

### **Prerequisites**

Basic programming knowledge

### **Course Outline**

#### **Module I – 10 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 – 10 Hrs**

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

#### **Module III – 10 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 – 10 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 – 10 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 5<sup>th</sup> Edition Mcgraw Hill

- International Edition  
2. Rajib Mall, Fundamentals of Software Engineering, PHI

## **CS5B12 – Programming in Java Lab-V**

**Course Number: 30**

**Contact Hours: 5 L**

**Number of Credits: \***

**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
- To learn
- To learn

### **Prerequisites**

Basic programming knowledge in C and C++

### **Programming in Java**

#### **Programs list**

- 1) Freehand Drawing
- 2) Illustrate Mouse Events
- 3) Creating Menu Bar
- 4) Package example
- 5) Exception handling example
- 6) Demonstrating threads
- 7) Demonstrating multilevel inheritance
- 8) Application form to accept address of student using Frames
- 9) Establishing JDBC connection
- 10) A simple swing application
- 11) A servlet reading and processing a parameter typed by the user into HTML form
- 12) Client sending message to the server using Java RMI

## CS5B13 – Web Programming Lab-VI

**Course Number: 31**

**Contact Hours: 5 L**

**Number of Credits: \***

**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
- To learn
- To learn

### Prerequisites

Basic programming knowledge in web programming

### Course Outline

<b>CS5D01</b>	<b>Open Course – I (Other Stream)</b>
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**Course Number: 32**

**Contact Hours: 4 T**

**Number of Credits: 3**

**Number of Contact Hours: 60 Hrs**

## CS5B14 – Mini Project Work

**Course Number: 33**

**Contact Hours: 2 L**

**Number of Credits: 2**

**Number of Contact Hours: 40 Hrs**

### Aim of the Course

To equip the students with Computer Application

## 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**

**Number of Credits: 3**

**Number of Contact Hours: 50 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 – 10 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 – 10 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 – 10 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 – 10 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 – 10 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**

**Number of Credits: 3**

**Number of Contact Hours: 50 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 – 10 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– 10 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 – 10 Hrs**

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

#### **Module IV– 10 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 – 10 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, 2<sup>nd</sup> Ed, 2007

## **CS6B17 Web Programming using ASP.NET**

**Course Number: 36**

**Contact Hours: 3 T**

**Number of Credits: 3**

**Number of Contact Hours: 50 Hrs**

#### **Aim of the Course**

To equip the students with basic programming skill in web programming

#### **Objectives of the Course**

- To learn php
- To learn
- To learn

#### **Prerequisites**

Basic programming knowledge in web programming

## Course Outline

### Module I – 10 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 – 10 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 – 10 Hrs

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

### Module IV– 10 Hrs

DataAdapter 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– 10 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 Microprocessor Lab - VII

**Course Number: 37**

**Contact Hours: 5 L**

**Number of Credits: 8**

**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

### CS6B19 Web Programming using .NET Lab -VIII

Course Number: 38

Contact Hours: 6 L

Number of Credits: 8

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
- To learn
- To learn

#### Prerequisites

Basic programming knowledge in web programming

#### Course Outline

**CS6D02**

**Open Course - II**

Course Number: 39

Contact Hours: 3 L

Number of Credits: 2

Number of Contact Hours: 50 Hrs

### CS6B20 – Project

Course Number: 40

Contact Hours: 2 L



**Number of Credits: 2**

**Number of Contact Hours: 40 Hrs**

#### **Aim of the Course**

To equip the students with Computer Application

#### **Objectives of the Course**

- To learn the basic concepts

#### **Prerequisites**

Basic programming knowledge

#### **Course Outline**

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

**COURSE 1 ELECTIVE**

## **CS5OD01A – Digital Electronics**

**Course Number: 32**

**Contact Hours: 4 T**

**Number of Credits: 3**

**Number of Contact Hours: 50 Hrs**

#### **Aim of the Course**

To equip the students with fundamental principles of programming language design

#### **Objectives of the Course**

- This course aims to build concepts regarding the fundamental principles of grammars, automata theory and Turing machine

#### **Prerequisites**

Basic mathematics knowledge

#### **Course Outline**

##### **Module I – 10 Hrs**

**Number Systems & Codes:** Review of Binary, Octal and Hexadecimal representations of numbers and their conversion - Signed numbers - Floating point number representation - Binary arithmetic - Weighted and non-weighted binary codes, error detecting & correcting codes - Alphanumeric codes - **BOOLEAN ALGEBRA:** Introduction to Boolean Algebra - Theorems - AND, OR, NOT, NAND, NOR & EX-OR operations, truth tables - Boolean expressions - Universal building blocks

##### **Module I – 10 Hrs**

**Minimization Of Logic Functions:** Sum of the products and Product of sums representations - Minimization of Boolean expressions using algebraic, K-map and Tabular methods, Minimization of multiple output functions - COMBINATIONAL LOGIC CIRCUITS: Analysis of logic schematics, Synthesis of combinational functions, Multiplexers, De-Multiplexers, code converters, decoders - Implementation of combinational functions using Multiplexers

#### Module III– 10 Hrs

**Arithmetic Circuits:** Adder, carry lookahead adder, number complements, subtraction using adders –signed number addition and subtraction – BCD adders - IC adders - FLIP-FLOP : Basic latch circuit, Debouncing of a switch, Flip-flops truth table and excitation table - Integrated circuit flip-flops - Latch timing conditions - Analysis of sequential circuits with latches, transition table, transition diagram and state table - Analysis of sequential circuit with feedback loops - Races in sequential circuits -

#### Module IV– 10 Hrs

**Counters:** Asynchronous and synchronous counter design – down counter, general BCD counter, counter lcs, ring counter, digital clock - SHIFT REGISTERS: Serial in, serial/parallel out; Parallel in, Right/left serial shift registers - Shift counters, universal shift register - Application of shift registers in keyboard entry of decimal data -

#### Module V – 10 Hrs

**Semiconductor Memories:** Bipolar inverter, DTL, TTL, ECL, IIL, and their comparison - Semiconductor memories: ROM, RAM, EPROM, EEPROM, DRAMS - External organization of semiconductor memories and timing characteristics, Flash type memories, PLA

#### Textbooks:

1. Computer Architecture and Logic Design – Thomas C Bartee - TMH.  
Digital Principles and Applications – Malvino and Leech – TMH

## CS50D01B – Operation Research

**Course Number: 32**

**Contact Hours: 4 T**

**Number of Credits:3**

**Number of Contact Hours: 50 Hrs**

#### Aim of the Course

To equip the students

#### Objectives of the Course

- To get a general introduction on accounting and its general application.

#### Prerequisites

Basic programming knowledge

#### Course Outline

##### Module I – 10 Hrs

Linear programming : Mathematical formulation- assumptions in linear programming- graphical method of solution – general properties – simplex method –duality- dual simplex- post-optimality analysis -series solution of differential equation and special functions.

#### **Module II – 10 Hrs**

Transportation and assignment problems : Transportation and transshipment problems assignment problems – sample programs.

#### **Module III– 10 Hrs**

Network analysis , CPM and PERT : Network minimization – shortest route problem – maximal-flow problems – project scheduling – critical path calculation- PERT calculations – sample programs.

#### **Module IV – 10 Hrs**

Decision theory: Introduction – decision making under conditions of certainty and uncertainty – maximax, maxmin, minmax and Harwicz criterion – decision making under conditions of risk – expected value criterion –Expected value Optimality Laws(EOL) criterion – Expected value of Perfect Information (EVPI)- decision trees.

#### **Module V – 10 Hrs**

Sequencing models : Processing of 'n' jobs through machines - 'n' jobs through three machines - two jobs through 'm' machines – maintenance crew scheduling.

#### **Textbook:**

1. Operations Research – Kanti Swarup.
2. Operations Research, L. R Potti

#### **References:**

1. Operations Research, 2<sup>nd</sup> Ed., Kalavathy, Vikas Publishers
2. Introduction to Operations Research: A Computer Oriented Algorithmic Approach - Gillete B.E (Mc-Graw Hill)
3. Quantitative Techniques in Management – Vohra N.D( TMH)
4. Operations Research for Management- Shenoy G.V, Shrivastava U.K & Sharma S.C (Wiley Eastern 2nd Ed)
5. Operations Research : An introduction – Taha H.A (Macmillan)

## **CS50D01C – Basic Psychology**

**Course Number: 32**

**Contact Hours: 4 T**

**Number of Credits: 3**

**Number of Contact Hours: 50 Hrs**

#### **Aim of the Course**

To equip the students with fundamental principles of programming language design

#### **Objectives of the Course**

- This course aims to build concepts regarding the fundamental principles of grammars, automata theory and Turing machine

## Prerequisites

Basic mathematics knowledge

## Course Outline

### Module I – 10 Hrs

A definition of Psychology-practical problems, Methods of Psychology, Work of Psychologists, Schools of psychology

### Module II – 10 Hrs

Attention & Perception- Conscious clarity, determinants of Attention, Distraction, Training attention, Physiological basis of attention, Sensory deprivation, attention and overt behaviour; Perceptual constancies, Instabilities, perception of fundamental physical dimensions, illusions, Organizational factors of perception, sensory interaction; Perception in learning

### Module III – 10 Hrs

Principles of learning - Classical conditioning, Operant Conditioning, Principles of reinforcement, Cognitive Learning, Individualized learning, Learner & learning

### Module IV – 10 Hrs

Memory - Kinds Of memory, Processes of memory, Stages of memory, Levels-Of-Processing model, Forgetting, Biology of memory

### Module V – 10 Hrs

Thinking and language- Thinking process, Concepts, Problem-solving, Decision Making, Creative thinking, Language, communication

## Reference

1. Morgan, Clifford.T., King, Richard.A., Weisz,John.R., Schopler, John (1993): Introduction to Psychology, TataMcGraw Hill.
2. Marx, Melvin H. (1976) Introduction to psychology - Problems, Procedures & Principles, MacMillan Publishing Co.
3. Hilgard, E.R., Atkinson, R.L., Atkinson, R.C., (1979): Introduction to Psychology, Harcourt Brace Jovanovich. Inc.

## CS50D01D – Accounting and Financial Management

**Course Number: 32**

**Contact Hours: 4 T**

**Number of Credits: 3**

**Number of Contact Hours: 50 Hrs**

## Aim of the Course

To equip the students

## Objectives of the Course

- To get a general introduction on accounting and its general application.
- To get a general understanding on various tools for financial statement analysis.
- To get a general understanding on accounting procedures up to the preparation of various financial statements.

- To get a general understanding and important tools for managerial decision making.

### Prerequisites

Basic programming knowledge

### Course Outline

#### Module I – 10 Hrs

Introduction – meaning of accounting - concepts and conventions – accounts - double entry system - Journal - subsidiary books (General introduction on various subsidiary books) – Ledgers – Trial Balance – preparation of trading account- Profit & Loss accounts – Balance sheet (method of depreciation)

#### Module II – 10 Hrs

Financial statements and its analysis, Financial statements – analysis of financial statements – tools of financial statements , analysis – comparative statement- common size statement – Trend analysis – Fund flow statement –Cash flow statement – Ratio analysis – (general introduction & simple problems)

#### Module III – 10 Hrs

Cost Concepts: Cost classification – Material cost – Labour cost – Overheads – Cost sheet and its representation – Inventory conventory methods – ABC, VED analysis – Perpetual inventory system – Methods of valuing material issues (FIFO, LIFO, HIFO)

#### Module IV – 10 Hrs

Decision making tools – Budget and budgetary control –types of budget –marginal costing – CVP analysis – standard costing – variance analysis

#### Module V – 10 Hrs

Computerised accounting -advantages –popular accounting packages –introduction to Tally –preparation of final accounts using Tally (simple problems)

#### Books:

1. Advanced Accountancy - R.L.Gupta, M. Radhaswamy, Svitani Chand & Sons
2. A Textbook of Accounting for Management, New Edition, Mahaswari, Vikas Publishers
3. Advanced Accountancy – S P Jain, K L Narang, Kalyani Publishers
4. Management Accounting - Shashi K Gupta, R K Sharma, Kalyani Publishers

## CS60D02A – Multimedia

**Course Number: 39**

**Contact Hours: 3 T**

**Number of Credits: 2**

**Number of Contact Hours: 50 Hrs**

### Aim of the Course

To equip the students

## Objectives of the Course

- To get a general introduction on accounting and its general application.

## Prerequisites

Basic programming knowledge

## Course Outline

### Module I – 10 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, Firewire(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 I – 10 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 Stretching, 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 I – 10 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 I – 10 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 & Editing Video – Shooting Platform, Lighting, Chroma Keys, Composition, Optimizing Video Files for CD-ROM.

### Module V – 10 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

## CS6OD02B – Hardware Assembly and Troubleshooting

**Course Number: 39**

**Contact Hours: 3 T**

**Number of Credits:2**

**Number of Contact Hours: 50 Hrs**

### Aim of the Course

To equip the students with basic hardware functioning and troubleshooting

### Objectives of the Course

- 

### Prerequisites

Basic programming knowledge

### Course Outline

#### Module I – 10 Hrs

**Fundamental Of Computer:** Block diagram and brief introduction of each block- Types of computers.

#### Module I – 10 Hrs

**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 – 10 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 Pribe)

### Module III – 10 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 – 10 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 – 10 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.

## CS60D2C – Operating System

**Course Number: 39**

**Contact Hours: 3 T**

**Number of Credits:2**

**Number of Contact Hours: 50 Hrs**

### Aim of the Course

To equip the students with basic concepts of Operating Systems

### Objectives of the Course

- To learn the basic concepts and functions of operating system

### Prerequisites

Basic programming knowledge in data structures

### Course Outline



### **Module I – 10 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 – 10 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 – 10 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 – 10 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 – 10 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 Wiley & Sons INC

### **Reference book:-**

“Operating Systems, Internals and Design Principles”-William Stallings-Fifth Edition-PHI Publications New D

## **S6OD02D – COMPUTER GRAPHICS**

**Course Number: 39**

**Contact Hours: 3 T**

**Number of Credits: 2**

**Number of Contact Hours: 50 Hrs**

### **Aim of the Course**

To equip the students

### **Objectives of the Course**

- To get a general introduction on accounting and its general application.

### **Prerequisites**

Basic programming knowledge

## Course Outline

### Module I – 10 Hrs

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

### Module II – 10 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 – 10 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 – 10 Hrs

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

### Module V – 10 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, 3<sup>rd</sup> 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 Applications*

**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	CMCA01	Computer Fundamentals & Application Packages	2	2	4	2	*	2
II	13	Complementary Course II	CMCA02	Programming in C	2	2	4	2	*	2
III	19	Complementary Course III	CMCA03	Fundamentals of System Software, Networks & DBMS	3	2	5	2	*	2
IV	25	Complementary Course IV	CMCA04	Visual Programming	3	2	5	2	4	6
		Complementary Practical Course V	CMCA05	Programming Lab						

Semester-I

Suggested Course Title- Computer Fundamentals

**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

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

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**SI LAB**  
**PRACTICAL LIST**

***MS WORD***

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

**MS EXCEL**

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

**MS POWERPOINT**

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

**Semester-II**

**Suggested 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

4. Programming in C by C. Karthikeyan
  5. Programming with C - Schaum Series
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#### **S2 LAB PRACTICAL LIST (C Programs)**

3. Prime nos up to n
4. n Fibonacci numbers
5. Factorial using recursion
6. Simple calculator
7. Solving quadratic equation
8. Checking Armstrong or not
9. String palindrome
10. Sorting nos and names
11. Matrix transpose
12. Matrix multiplication
13. Trace of a matrix
14. Sum of the digits and reverse
15. Sin series
16. Cosine series
17. First n Even no and odd numbers in a range
18. Vowels in a string
19. LCM and HCF of 2 nos

20. No of positives, negatives and zeros in a set of numbers
21. Base conversion
22. Appending array

### **Semester-III**

#### **Suggested 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 Dhamdhare
- 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**

5. Simple HTML document creation
6. Table creation
7. List creation

**MYSQL**

- Database creation
  - Data retrieval
  - Insertion and deletion
  - Alteration of a table
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**Semester-IV**

**Suggested 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

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

Reference Books

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

## **S4 LAB**

### **PRACTICAL LIST**

Creating applications using VB.Net. Minimum 15 applications

#### **Practical record**

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

20 C Programs & 15 VB.NET applications

**Practical 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**

	Weightage	Grading
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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 Nos	Weightage
Twenty multiple choice objective questions (4 choices for each question)	1 - 4 5 - 8 9 - 12 13 - 16 17 - 20	1 1 1 1 1
Six Short Answer Questions to be answered in one or two sentences	21 - 26	1 x 6 = 6
Six Short Essays to be answered in 50 words each. Only four questions (best four) will be considered for weightage.	27-32	4 x 2 = 8
Three Long Essays to be answered in 100 words each. Only		

two questions (best two) will be considered for weightage.

33-35

$2 \times 4 = 8$

**Total Weightage - 27**

