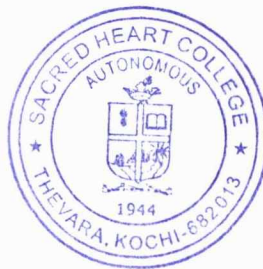



**NEW REVISED SYLLABUS  
WITH  
CREDITS AND HOURS  
OF  
BSC COMPUTER APPLICATIONS**

**DEPARTMENT  
OF  
COMPUTER SCIENCE**

**S H COLLEGE, THEVARA**



  
**Dr. Jose John**  
Principal in Charge  
Sacred Heart College (Autonomous)  
Thevara, Kochi-682 013

## BSC COMPUTER APPLICATIONS

SEMESTER	1	2	3	4	5	6	CREDITS
COMPUTER APPLICATIONS	12HR / 8CR	12HR / 9CR	15HR / 12CR	10HR / 9CR	10HR / 10CR	15HR / 12CR	60

### NEW REVISED SYLLABUS WITH CREDITS AND HOURS COMPUTER SCIENCE

SEMESTER	TITLE OF THE COURSE	NO. OF HOURS / WEEK	TOTAL CREDITS	TOTAL HRS. PER SEMESTER	UNIVERSITY EXAM DURATION	WEIGHTAGE	
						IA	EA
1	1. Programming in C	4	3	72	3	1	3
	2. Fundamentals of Digital System	4	3	72	3	1	3
	3. S/W Lab - I	4	2	72	3	1	3
2	1. Data Structures	4	3	72	3	1	3
	2. Micro Processors & Computer Organization	4	3	72	3	1	3
	3. S/W Lab – II	4	3	72	3	1	3
3	1. Data Communication and Computer Networks	4	4	72	3	1	3
	2. Object Oriented Programming In C++	4	3	72	3	1	3
	3. System Analysis and Design	4	3	72	3	1	3
	4. S/W Lab - III	3	2	54	3	1	3
4	1. Visual Basic Programming Technique	4	3	72	3	1	3
	2. Database Management Systems	4	4	72	3	1	3
	3. S/W Lab - IV	2	2	36	3	1	3
5	1. Java Programming	4	4	72	3	1	3
	2. Open Course ( Internet, Web Designing And Cyber Laws)	4	4	72	3	1	3
	3. S/W Lab - V	2	2	36	3	1	3
6.	1. Operating Systems ( Linux Operating System)	5	4	90	3	1	3
	2. Elective (Linux)	5	4	90	3	1	3
	3. Project	5	4	90	3	1	3

# SEMESTER I

## Programming in C

### **Unit 1:**

**Problem Solving:** Problem Definition, Problem Solving, Logic developments tools - Algorithm, Flowcharts, pseudo code, Modular programming, structured and object oriented – top down and bottom up approaches, features of a good computer program.

### **Unit 2:**

**C language basics:** C character set, Identifiers and keywords, Data types, Enumeration type, constants, variables, declarations, qualifiers – long, short and unsigned declarations, expressions, symbolic constants, input/output functions, compound statements, arithmetic operators, unary operators, relational and logical operators, assignment operators, increment and decrement operators, Precedence and order of evaluation, conditional operators, bit operators, type casting, using library functions in math.h

### **Unit 3:**

**Control flow:** If statement, if...else statement, nested if ..else statement, switch statements, looping – for loop , while loop, do ... while statements, nested loop structure, break, continue and go to statements.

**Arrays & Strings:** Single dimensional arrays, multidimensional arrays, initializing array using static declaration, Searching and sorting of Arrays, Array of Characters, Character arrays and strings, String handling Functions.

### **Unit 4:**

**User Defined Functions:** Function declaration, definition & scope, recursion, Arrays and functions, call by value, call by reference, Storage Classes: automatic, external (global), static & registers.

**Structures:** Definition of Structures, declaration, structure passing to functions, array of structures, arrays with in structures, unions, typedef statements.

### **Unit 5:**

**Pointers:** Pointer Definition, pointer arithmetic, array & pointer relationship, pointer to array, pointer to structure, dynamic memory allocation, **Files:** Introduction to files, fopen(), fscanf(), fprintf(), getc(), putc(), fclose(), Simple file handling programs. Concept of command line arguments.

### **Book of study:**

Programming in ANSI C 4E , E. BalaGuruswamy, TMH

Programming in C, Byron S Gottfried, Shaum's Outline series. TMH

### **References:**

Computer Fundamentals By P K Sinha & Priti Sinha Fourth Edition.

B. Kernighan and D. Ritchie, "The ANSI C Programming Language", PHI

# Fundamentals of Digital Systems

## **Unit 1:**

**Number Systems:** Base of a number system, Positional number system, Popular number systems (Decimal, Binary, Octal and Hexadecimal), Counting in binary number system, Conversion-Decimal to Binary, Binary to Decimal, Decimal to Octal, Octal to decimal and binary, Decimal to hexadecimal, Hexadecimal to decimal, Binary and octal, Concept of binary addition and subtraction, Complements in binary number systems,  $1^s$  Complement,  $2^s$  Complement and their applications, Number representation in memory- bi-stable devices, Signed magnitude form, Representation of real numbers, BCD numbers- concept and addition, Concept of parity bit.

## **Unit 2:**

**Boolean Algebra and Gate Networks:** Logic gates- AND, OR, NOT, NAND and NOR – Truth tables and graphical representation, Basic laws of Boolean Algebra, Simplification of Expressions, De Morgan's theorems, Dual expressions, Canonical expressions, Min terms and Max terms, SOP and POS expressions, Simplification of expression using K-MAP (up to 4 variables), Representation of simplified expressions using NAND/NOR Gates, Don't care conditions, XOR and its applications, parity generator and checker.

## **Unit 3:-**

**Sequential and Combinational Logic.** Flip flops- Latch, Clocked, RS, JK, T, D and Master slave, Triggering of flip flops, Counters- Synchronous and asynchronous, BCD, Ripple counters, Half adder, Full adder (need and circuit diagram), Encoders, Decodes, Multiplexers and Demultiplexers (working of each with diagram), Analog to digital and digital to analog converters (Diagram and working principle).

## **Unit 4:-**

**The Memory Elements:** Concept of Registers, Shift Registers, Flip flops as building blocks of memory, RAM, ROM, organization.

## **Book of study :**

M.M.Mano-Digital Logic and Computer design

## **References:**

1. Thomas C Bartee- Digital computer Fundamentals
2. Floyd- Digital Electronics
3. Malvino & Leach- Digital Principles and Applications

## Software Lab I

[There will be two questions: the first from Exercises 3 to 5 and the second from Exercises 6 to 10. Exercises 1 and 2 will be included in the viva]

**1. Familiarization of Computer System and installation:** Demonstration of various units of Computer system, handling of devices, demo on hardware units, Login process, Booting Process, software installation, driver installation, printer installation etc.

**2. Practicing Operating System Commands:** MS-DOS internal & External commands (dir, copy, del, ren, copy con, date, time, chkdsk, mkdir, cd, rmdir, EDIT etc). MS-WINDOWS – using start menu, desk top, task bar, word pad, note pad, file management- creation, copy, delete, moving of files in directories, selecting and executing a program - Demonstration of editing, compiling and executing a C program using a C compiler.

**3. Programs using Basic Constructs:** Fundamental data types, qualifiers- long, short, unsigned, input/output functions – scanf(), printf(), Arithmetic expressions, Evaluation of integer, real and mixed mode arithmetic expressions, truncation effect, type casting, relational and logical expressions, Conditional operators, trigonometric functions- sin(), cos(), tan(), mathematical functions – abs(), sqrt(), round() defined in math.h, printing formatted outputs using width specifier.

**4. Programs using control structures:** if, switch, for, while, do...while, nested structures, break and continue. Sample programs should include printing of Fibonacci numbers, prime numbers, check for Armstrong numbers, summation series – exp(x), sin series etc and verification of result using built in functions, printing pyramid like pattern & other similar patterns using nested loops.

**5. Programs using Arrays:** Array based programs – Creation of array containing prime numbers, matrix addition, matrix multiplication, transpose of a matrix, array sorting, preparing rank lists based on marks, searching of arrays (linear) for finding price of an item. Static initialization of arrays.

**6. String manipulation programs** – reading strings using %s, gets(), getchar(), copying one string into another, counting number of characters, vowels, words etc, using string handling functions.

**7. User Defined Functions:** Programs using return type functions, void type functions, example program using recursive functions, array sorting program using function with call by reference, function to copy one string into another.

**8. Program using structures:** array of structures, program using structure containing arrays and array of structures. Rank list preparation

**9. Simple program using pointers**

**10. Program to create a data file, reading a data file** , Simple file program for file creation and file manipulation. Search for record(linear search) and displaying

# SEMESTER II

## Data Structures

### **Unit 1:**

**Concept of Structured data:** Data structure definition, Different types and classification of data structures, Arrays – representation of array in the memory, linear array operations, Bubble sort, Selection sort, linear search, binary search, sparse matrix.

### **Unit 2:**

**Stacks and Queues:** organization and operation on stacks – Conversion between infix to postfix & prefix representations- Expression Evaluation - Organization and operations on queues-circular queue-multiple stacks and queue - Applications of stacks and queues.

### **Unit 3:**

**Linked list:** Concept of dynamic data structures, linked list, types of linked list, linked list using pointers, insertion and deletion – examples, circular list – doubly linked lists, garbage collection.

### **Unit 4:**

**Trees:** Concept of recursion, definition of - trees, binary trees, strictly binary trees, complete binary tree and Binary search tree, Creation of binary search tree, traversing methods - examples.

### **Unit 5:**

**File organization:** File organizations- sequential, random files, linked organization, inverted files, cellular partitioning, hashing function

### **Book of study :**

Data Structures Through C (A Practical Approach), G.S Baluja Danapat Rai & Co.  
Fundamentals of Data Structures, Ellis Horowitz and Sartaj Sajni Galgotia Publications

### **References:**

Introduction to data structures in C , Ashok N. Kamthane, Person Education  
Theory and Problems of Data Structures, Schaum's Outline Series, Seymour Lipschutz  
Data structures using c and C++ , Tanenbaum

# **Microprocessors & Computer Organization**

## **Unit 1**

Functional units of a computer, Basic operational concepts, Bus structure, Addressing methods, Memory locations and addresses, Instructions and instruction sequencing, Instruction execution.

## **Unit 2:**

Introduction to the concept of 8085 microprocessor: Intel 8085, Instruction cycle, Timing diagrams, Instruction set of 8085, Addressing modes, Status flags, Intel 8085 Instructions.

## **Unit 3:**

Introduction to the concept of 8086 microprocessor: Introduction, Pin-out Diagram, Operating modes, Operation of 8086, Registers, Interrupts, Bus Cycle, Addressing modes.

## **Unit 4:**

Central Processing Unit: General Register Organization, Stack Organization, Instruction Formats, Instruction Classification.

## **Unit 5:**

Main Memory, Organization of RAM, SRAM, DRAM,, Read Only Memory-ROM,PROM,EROM,EEPROM, Auxiliary memory, Cache memory, Virtual Memory, Memory mapping Techniques.

## **Books of study :**

1. B RAM -Fundamentals of microprocessors and micro computers
2. M M Mano – Computer Architecture

## **References:-**

1. R S. Gaonkar- Micro processor Architecture, Programming and applications with 8085.  
Venugopal and Ravikanth- Introduction to assembly language programming in 8086

## Software Lab II

1. Array search and sort – Bubble sort, Selection sort, linear search, binary search, sparse matrix, polynomial addition.
2. Stack implementation, Application of stacks – Conversion of infix expression to postfix, expression evaluation.
3. Queue implementation, Implementation of circular queue.
4. Linked list- implementation, concatenation etc., circular list and doubly linked list implementation, implementation of stacks and queue using linked lists.
5. Creation and traversal of binary search trees.



# **SEMESTER III**

## **Data Communication and Computer Networks**

### **Unit 1**

Introduction to Data Communication, Network, Protocols & Standards and Standards Organizations -Topology - Transmission mode - Network models – OSI model – layers and their functions in OSI model – TCP/IP.

### **Unit 2**

Data and Signals-Analog and Digital Signals –Wave Length, Bit Rate, Bit Length-Transmission Impairment-Attenuation, Distortion and Noise. Bandwidth Utilization: Multiplexing –FDM,TDM,WDM and Spreading. Transmission Media –Guided Media - Unguided Media . Switching- Circuit Switching, Datagram Network, Virtual Circuit. Dial up Modem.

### **Unit 3**

Data Link layer. Error detection and Correction Codes. Framing, Flow Control and Error Control . Protocol for Noisy and Noiseless Channel.

Multiple Access : Random Access- ALOHA, CSMA, CSMA/CD . Channelisation Methods. Wired and Wireless LAN. Wireless WAN-Cellular Telephony and Satellite Networks.

### **Unit 4**

Connecting Devices : Hubs, Switches, Repeaters, Bridges, Routers – Gateway.

Network Layer: Host to Host delivery - Logical Addressing – Internet protocol: IPV4 and IPV6 – Address Mapping – ICMP – IGMP – Uni Casting, Multicasting and Broadcasting

### **Unit 5**

Transport Layer: UDP – TCP- Congestion Control: Open and Closed loop, Quality of service.

Application Layer: Name Space – Domain Name System Remote logging, FTP, SMTP, Multimedia Communication., Voice over IP.

Cryptography-Symmetric Key Cryptography and Asymmetric key Cryptography.

### **Text:**

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 4<sup>th</sup> Edition - TMH-2000

# Object Oriented Programming In C++

## Unit 1:

**Introduction-** Object Orientation- object oriented development-Object oriented Methodology-Object oriented Models-Object oriented themes-Modeling-Objects and classes concepts-Links and association concepts-Generalization and Inheritance-state modeling-interaction modeling

## Unit 2:

**Object Oriented language C++:** Basic concept of object oriented programming -benefits of oops-Structure of C++ Program-Basic, derived and user defined data types-Symbolic constants-operators in C++ - Control Structures -Functions in C++-The main function, function prototyping-call by reference-return by reference- inline function-function overloading- friend and virtual functions,

## Unit 3:

**classes and objects-**specifying a class - Defining member functions - Nesting of member functions - Private member functions - arrays within a class - static data members - static member functions - Arrays of objects-objects as function arguments

## Unit 4:

**Constructors and Destructors-** Constructors- Parameterized Constructors-Multiple constructors - Copy constructor - Dynamic constructor-Destructors - Operator overloading & Type conversions.

**Inheritance-**Defining derived classes-Single, Multiple, Multilevel, Hierarchical and hybrid inheritance- private, public, protected inheritance-virtual base classes-Abstract classes-Constructors in derived classes- nesting of classes.

## Unit 5:

**Pointers-Virtual functions and polymorphism-**Pointers-Pointers to objects-this pointer-pointer to derived classes-virtual functions-Pure virtual functions-C++ streams-Stream classes-Unformatted and Formatted console I/O operations- Managing output with manipulators. Manipulating strings.

## Book of study :

Object Oriented Modeling and Design with UML, Second Edition By James Rumbaugh, Michael Blaha

Object oriented Programming with C++, Fourth edition By E. Balaguruswamy

## References :

Let Us C++ ,Yashwant Kanetkar, Bpb Publications

John R Hubbard, Programming with C++, Shaum's Outline series.

Objected-Oriented Programming in C++ , Rajesh K Shukla, Wiley India.2008 Edition

Venugopal, Rajkumar, Ravishankar, *Mastering C++*, Mc Graw Hill

# System Analysis And Design

## **Unit I**

**Information systems concepts**, Business information systems; Describing the business organization – organization chart, organization function list ; information system levels - operational, lower, middle, top management; the system development life cycle concepts; hardware and software end products.

**Life cycle activities-** life cycle flow chart, task, management review, baseline specifications, role of system analyst.

## **Unit II**

**Basic tool of system analysis:** identification codes – definition, need for codes, code plan, code dictionary, common type of codes, forms design – basic parts of form, style and types of form, principles of form design

**Tools for structure analysis and design:** Types of basic charts, decision tables, decision trees, structured English, data flow diagram, data dictionary, system flow charts, flow charting symbols, information oriented flow charts, process oriented flow charts, HIPO charts.

## **Unit III**

**Study phase:** Study phase activities, information service request, initial investigation, fact finding techniques, fact analysis techniques, steps in feasibility analysis, study phase report.

## **Unit IV**

**Design phase:** Design phase activities, structure design, input design- input data, input media and devices, output design, design phase report.

## **Unit V**

**Development phase:** Development phase activities, bottom up and top down computer program development, training- programmer, operator, user trainings ; conversion; change over plan; PERT; steps in computer program development; structured programming; development phase report.

## **Book of study :**

Elements Of System Analysis – Marvin Gore & John Stubbe, Galgotia Book Source.

## **References :**

System Analysis And Design – Elias M Awad , Galgotia Book Source.

Software Engineering Concepts – Richard Fairley , Tata Mc Graw Publication.

## Software Lab III

[There will be two questions one from 1 to 4 and second from 5 to 8]

1. Programs based on class, objects and manipulation of objects using member functions
2. Programs based on friend functions, passing objects as arguments to function.
3. Programs based on array of objects.
4. Programs based on function overloading, Default arguments.
5. Programs based on operator overloading (binary, unary) using member functions and friend functions.
6. Programs based on constructors, different types of constructors- copy constructor, default constructor.
7. Programs based on Inheritance, different types of inheritance.
8. Programs using virtual functions and polymorphism, this pointer

## Semester IV

### Visual Basic Programming Techniques

#### **Unit 1**

**Visual Basic–Basic Concepts:** Getting Started with Visual Basic 6, Understanding Visual Basic Projects, Designing the user interface, Putting your Forms to Work with controls, Mastering Menus and Toolbars.

#### **Unit 2**

**Programming in Visual Basic :** Visual Basic Code Basics, Using Visual Basic Variables, Using the Visual Basic Debugging Tools, Handling Runtime Errors.

#### **Unit 3**

**Objects and Classes :** Creating Objects and Classes, Advanced Class Concepts, Working with objects and collections.

#### **Unit 4**

**Working with other Applications & Database Access:** Mastering the Visual Basic Data Control, Creating Queries in Visual Basic, Mastering Jet DAO.

#### **Unit 5**

**Advanced Data Access Methods & Report generation :** Using Advanced Data Access Methods – ADO, OLEDB; Using Crystal Reports, Using the Package and Deployment Wizard.

#### **Book of study :**

Peter Norton's Guide to Visual Basic 6 by Peter Norton and Michael Groh, Techmedia Publications -Chapters:

#### **References:**

1. Visual Basic 6 from the Ground Up by Gary Cornell, Tata McGraw-Hill
2. Using Visual Basic 6 by Bob Roselman, Richard Peasley and Wayne Prunchiah, PHI

## Data Base Management System

**Unit –I: Introduction:** Characteristics of database approach, Data base users-DBA, Data base designers and end users, Advantages of using DBMS, Data Modes- Schemas and instances, DBMS architecture and data independence. DBMS language-DDL, DML,DCL Data Base system environment, DBMS Component and modules.

**ER Modeling-** Introduction- Entity types, Entity sets, Attributes and Keys, Relationship Types, Relationship Sets relationship instances, Constraints on relationship types, Weak entity types, sample ER diagrams.

**Unit-II: Relational Data Model:** Relational model concepts domains, attributes, tuples and relations, characteristics of relations. Relational Model constraints Relational Databases and relational data base schemas, entity integrity, referential integrity and foreign keys with examples.

**Relational algebra and Relational calculus:**

Relations Operations- SELECT, PROJECT, , UNION, INTERSECTION, The CARTESIAN PRODUCT, JOIN, EQUIJOIN, Aggregate functions. Examples of queries in Relations Algebra Tuple relations calculus, Domain relational calculus.

Relational Data base design using ER-to-Relational mapping.

**Unit-III : SQL:** Data definition commands- CREATE, ALTER,DROP, Adding constraints, Basic SQL queries-INSERT, SELECT,DELETE,UPDATE Ordering of rows UNION,EXCEPT,INTERSET Substring comparisons using LIKE operator, BETWEEN operator, Complex Queries-Nested queries, EXISTS and UNIQUE functions, NULL values, Renaming of attributes and joining of tables, Aggregate functions and grouping, Managing views

**Unit IV: Data Normalization:-** Informal Design Guide lines for relation schemas, functional dependencies, Normal forms- first, second and third normal form, Boyce- Codd normal form.

**Indexing structures for files-** types of single level ordered indexes.

**Unit V: Transaction processing:-** Introduction to transaction processing, Transaction and system concepts, Desirable properties of transactions. Concurrency Control:- Locking techniques for concurrency control.

**Database Security and Authorization:-** Types of security , control measures, database security and the DBA, Access protection, User accounts and database audits, Access Control based on granting and Revoking privileges.

**Book of study :**

Ramez Elmasri and Shamkant B. Navathe, “Fundamentals of Database Systems” Pearson Education, 5<sup>th</sup> edition

**References:**

1. C.J Date, An Introduction to Database systems
2. Reghu Ramakrishnan, Data base Management Systems, Mc Graw Hill international Edition.
3. Bipin Desai, “ An Introduction to Database Systems” Galgoria Publications, 1991

## Software Lab IV

[There will be two questions, the first one from Group I and second from Group II]

### I SQL Commands

1. **Data definition commands** - CREATE, ALTER, DROP, Adding Constraints – Primary key, foreign key, unique key, check, not null.
2. **Basic SQL queries** – INSERT, SELECT, DELETE, UPDATE, Using multiple tables, ordering of rows using ORDER BY option, Set operations using UNION, EXCEPT, INTERSECT, Substring Comparison using LIKE operator, BETWEEN operator.
3. **Complex Queries** – Nested Queries, EXISTS and UNIQUE/DISTINCT functions, NULL values, Renaming of attributes and Joining of tables, Aggregate functions and grouping.
4. **Managing views, Simple stored procedures.**
5. **Data Control commands** - Access Control and Privilege commands.

### II Visual Basic

6. **Designing User Interface using-** List Box, Combo Box, Image and Picture Box, Directory-File-Drive list boxes, Rich text box, etc
7. **Creating Menus-** Creating Menus and writing Codes, Linking Menus with SDI forms, Creating toolbox and access it for loading and working forms.
8. **Database Connectivity using Controls** - Designing user interface with forms and controls and create database connectivity by DAO and ADO Control.
9. **Database connectivity using Object models** - Creating Database connectivity by DAO Object model and Connectivity Using ADO Object model by OLEDB as well as ADODC Connectivity.
10. **Creating Reports** - Create reports using Data Report in VB and also using Crystal report.
11. **Package and deployment Wizard** - Package, Deploy and Scripting

# **SEMESTER V**

## **Java Programming**

### **Unit 1:**

Object oriented programming-Encapsulation-Inheritance-Polymorphism-Genesis of Java- characteristics of java- program structure-identifiers-operators-variables-literals-data types- Arrays. Control Statements-selection statements-iterative statements-jump statements - Loops- while loop-do while loop- for loop

### **Unit 2:**

Classes-declaration –object references-instantiation- method declaration-method calling – this operator- constructor- method overloading-constructor overloading-method overriding- inheritance-super class-dynamic method dispatch-final-static-abstract classes – String Handling.

### **Unit 3:**

Packages - creating packages-using packages-Interfaces-Exception Handling Techniques-try-catch-throw-throws-finally -Multithreading- creation of multithreaded program-Thread class- Runnable interface- thread priorities.

### **Unit 4:**

Event Handling-Delegation Event Model-Event Classes-Sources of Events-Event Listeners- AWT: Frame Class-AWT Controls: Label-Button-Checkbox-List-Choice control-Text Field- Text Area- Lay out Managers.

### **Unit 5**

Applet Fundamentals -applet tag-applet life cycle-passing parameters to applets- working with graphics –Line-Rectangle-Oval – Arc- color setting-I/O Streams: DataInputStream- DataOutputStream-BufferedReader-BufferedWriter classes

### **Book of study :**

Java2 The Complete Reference Seventh Edition: Patrick Naughton

### **References:**

Programming with java –E. Balagurusamy

1. Core Java Volume 1- Fundamentals eighth edition – Cay S Horstmann & Gary Cornell
2. Java 6 Programming Black Book 2007 Edition – Dreamtech press-



## **Internet, Web Designing And Cyber Laws (Open Course)**

**Unit 1:** Internet – Introduction, Basic Communication, Local Area Network, Packet Switching, Internet: A Network of Networks, ISPs and Network Connections, IP Address, Transmission Control Protocol (TCP), Domain Names.

**Unit 2:** Internet Services: Electronic mail, Bulletin Board Service (Network News), Browsing the World Wide Web, Automated Web Search (Search Engines), Audio and Video Communication, Faxes and Files (FTP), Remote Login.

**Unit 3:** Facilities for Secure Communication, Electronic Commerce and Business.

**Unit 4:** Web Programming - Introduction to Html, Creating Web Pages, Formatting Tags, Font, lists, table, form, marquee, frame tags, Creation of simple Web Sites.

**Unit 5:** Cyber Crimes –Computer Crime, Nature of Crimes, Penalty for damage to Computer, Computer system, Tampering with Computer Source Documents, Hacking, Computer Related Offences, Theft, The Language of Cyberspace.

### **Books of study :**

1. “The Internet”, Douglas E. Comer, Prentice –Hall of India, Third Edition.
2. HTML Black Book
3. “Cyber Law Crimes”, Barkha and U. Rama Mohan, Asia Law House, New Edition.

### **References**

1. “Internet Complete Reference”, Harley Hahn

### **Other Open Courses:**

Image Processing  
Multimedia  
Software Testing  
Software Engineering

## Software Lab – V

### **Part I**

**Applet Programs :** Graphics- AWT controls- Event Handling

**Part II** (using class and read inputs from keyboard)

**Java Programs:** Method Overloading- Method Overriding-inheritance-abstract class – interfaces- packages-Exception Handling-Multithreading

# **SEMESTER VI**

## **Operating Systems**

### **Unit 1:**

**Introduction:** OS Definition, Functions, OS as a resource manager, types of OS Evolution of OS, Operating System Operations, Operating System Services, User Operating System Interface, System Calls, Types of System Calls.

### **Unit 2:**

**Process:** Basic Concepts, Process Scheduling, Operations on 'Processes, Inter process communication, **Process Scheduling - Scheduling Criteria, Scheduling Algorithms, Multiple Processor Scheduling.**

### **Unit 3:**

**Process Coordination :** Synchronization - The Critical Section problem, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors. Dead Locks : System Model, Dead Lock Characterization, Methods of Handling Dead Locks, Dead Lock Prevention, Dead Lock Avoidance, Dead Lock Detection, Recovery from Dead Lock.

### **Unit 4:**

**Memory Management:** Memory Management Strategies -Swapping, Contiguous memory allocation, Paging, Segmentation. Virtual Memory Management- Demand paging, Page Replacement

### **Unit 5:**

**Storage Management :-**File System :- File Concept, Access Methods, Directory Structure, protection , Implementing File Systems :-File System Structure, Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery.

### **Books of study :**

Operating System Principles, Seventh Edition, Abraham Silberschatz, Peter Galvin and Greg Gagne, John Wiley

Operating Systems- By William Stallings

### **Reference:**

Operating Systems- By Milan Kovic (TMH )

# Linux Operating System (Elective)

## **Unit 1:**

**Linux introduction and file system** - Basic Features, Advantages, Installing requirement, Basic Architecture of Unix/Linux system, Kernel, Shell - Linux File system - Boot block, Super block, Inode table, Data blocks, Linux standard directories. Commands for files and directories – cd, ls, cp, rm, mkdir, rmdir, pwd, file, more, less, Creating and viewing files using cat, file comparisons, View files, disk related commands, checking disk free spaces.

## **Unit 2:**

**Essential Linux commands, Understanding shells, Processes in Linux, process fundamentals, connecting processes with pipes, redirecting input/output, Background processing, managing multiple processes, scheduling of processes. Batch commands, kill, ps, who, Printing commands, find, sort, touch, file, file processing commands - wc, cut, paste etc - mathematical commands - expr, factor etc. Creating and editing files with vi editor**

## **Unit 3:**

**System administration** - Common administrative tasks, identifying administrative files – configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Creating and managing groups, modifying group attributes, Temporary disabling of user's accounts, creating and mounting file system, checking and monitoring system performance - file security & Permissions, becoming super user using su. Getting system information with uname, host name, disk partitions & sizes, users, kernel, installing and removing packages with rpm command

## **Unit 4:**

**Shell programming** - Basics of shell programming, various types of shell available in Linux, comparisons between various shells, shell programming in bash  
Conditional and looping statements, case statement, parameter passing and arguments, Shell variables, system shell variables, shell keywords, Creating Shell programs for automating system tasks

## **Unit 5:**

**Simple filter commands** – pr, head, tail, cut, sort, uniq, tr - Filter using regular expression – grep, egrep, sed **Understanding various Servers** —DHCP, DNS, Squid, Apache, Telnet, FTP,Samba.

## **Book of study :**

1. “Red Hat Linux Bible” by Cristopher Negus, Wiley Dreamtech India
2. “UNIX Shell Programming” by Yeswant Kanethkar, BPB

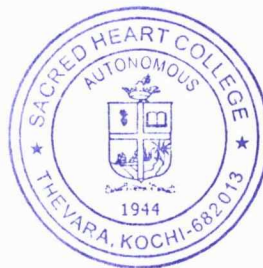
## **References :**


1. “Official Red Hat Linux User's guide” by Redhat, Wiley Dreamtech India
2. “UNIX for programmers and users” by Graham Glass & King Ables, Pearson Education
3. “Beginning Linux Programming” by Neil Mathew & Richard Stones, Wiley Dreamtech India

## MAIN PROJECT

### Software Development lab

The project topic shall be chosen from areas of current day interest using latest packages/ languages running on appropriate platforms, so that the student can be trained to meet the requirements of the Industry. A project report shall be submitted in hard bound complete in all aspects. For internal evaluation, the progress of the student shall be systematically assessed through various stages of evaluation at periodic intervals.



  
Dr. Jose John  
Principal in Charge  
Sacred Heart College (Autonomous)  
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