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शिवाजी विद्यापीठ, कोल्हापूर - ४१६ ००४.

दुरध्वनी : (ईपीएबीएक्स) २६०९००० विस्तारीत क्र. २६०९०९४) तार : युनिशिवाजी  
फॅक्स : ००९१-०२३१-२६९१५३३ व २६९२३३३. e-mail : bos@unishivaji.ac.in

शि.वि./अ.मं./कॉमर्स/एम.सी.ए./14177

दि.28.3.2008

प्रति,  
अधिविभागप्रमुख/संचालक,  
कॉमर्स अॅन्ड मॅनेजमेंट विभाग,  
शिवाजी विद्यापीठ, कोल्हापूर

विषय:- एम.सी.ए.(वाणिज्य) या कोर्सच्या अभ्यासक्रमाबाबत.

महोदय,

उपरोक्त विषय संदर्भात आपणांस आदेशान्वये कळविण्यात येते की, विद्यापीठ अधिकार मंडळाच्या मान्यतेस अनुसरून एम.सी.ए.(वाणिज्य) या कोर्सचा सुधारित अभ्यासक्रम शै. वर्ष 2007-08 पासून अंमलात आणण्यात येत आहे. सोबत सदर अभ्यासक्रमाची प्रत जोडलेली आहे.

सदरचा अभ्यासक्रम विद्यापीठाच्या वाणिज्य अधिविभागात सुरू असलेल्या एम.सी.ए. ते एम.सी.ए. अपग्रेडेशनकरीताही लागू राहिल याची कृपया नोंद घ्यावी.

सदरचा अभ्यासक्रम सर्व संबंधित शिक्षक व विद्यार्थी यांच्या निदर्शनास आणावा. कळावे,

आपला विश्वासू

Sd/-

उपकुलसचिव

प्रती:-

1. अधिष्ठाता, वाणिज्य विद्याशाखा
2. अध्यक्ष, व्यवसाय व्यवस्थापन अभ्यास मंडळ
3. इतर परीक्षा-2 विभाग
4. परीक्षक नियुक्ती विभाग
5. पी.जी.संलग्नता विभाग
6. पात्रता विभाग
7. पी.जी.प्रवेश विभाग

# **SHIVAJI UNIVERSITY, KOLHAPUR.**



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Faculty of Commerce  
Revised Syllabus For  
**Master of Computer Application (MCA)**

(Subject to the modifications that will be made from time to time)  
**Syllabus to be implemented from June 2008 onwards.**

**Proposed Syllabus of**  
**MASTER OF COMPUTER APPLICATIONS (MCA) COURSE**  
(Under the faculty of Commerce)  
w.e.f Academic year 2007-08 and onwards

**1 Introduction:**

Considering the current requirement of Computer software development and emerging trends in the Information Technology Industry, there is need to make student aware and synchronize with the skills required in the industry. It is necessary to make changes in present curriculum of MCA.

**2 Objective of the Course:**

The main objective of the course is to develop different software development skills in the students with current trends in IT industry and to take up student at various positions in the IT Industry such as System Analyst, System Manager, Software Engineers, Web Design Programmers, EDP Managers, Academician in different areas of computer application, Management and Information Technology Industry.

Keeping above mottos, curriculum includes extensive study of problem solving and system development and project design and development sessions, and extensive practical sessions in different programming environment under different operating environment. It also includes versatile subjects on business management and business organization.

**3 Duration of MCA Degree:**

The duration of the course is three years divided into three parts of six semesters. The teaching of semester I, III and IV will Start from 1st Aug. to 15th of November (14 weeks) and the teaching for the semester II and IV will start from 1st Jan. to April (14 weeks). There will be semester end examination in December and June for all the semester. In addition there will be internal examinations for each paper to be conducted by the respective institutes /colleges.

**4 Eligibility for admission:**

Admissions to MCA course is open to any graduate from Shivaji University or graduates from any other statutory university satisfying the following conditions:

- a. The candidate should have secured at least 50% marks at the Final year of graduate in the university examination.
- b. The knowledge of Mathematics at XII standard level is desirable.
- c. MCM Students are eligible under MCM to MCA upgradation programme. Under this, those who had completed MCM from Shivaji University or any other Statutory University are eligible for taking admission to the semester IV of MCA Degree.

**5 Admission Procedure:**

Admission to the MCA Course is based on the merit of entrance test and personal interview. Every candidate has to appear for Entrance test and personal interview. 50% seats are reserve for the students coming from outside the Shivaji University area provided that performance is not below that 50% in Entrance test and personal interview. (Note : Entrance test and personal interviews are not applicable for MCM to MCA upgradation program students. )

**6. Strength of the Student:**

For regular batches in the colleges or institutes is as per the ACITE's and Shivaji University's norms. For MCM to MCA upgradation, intake capacity for Semester IV is 40 students per batch.

**7. Teacher Qualification:**

As per the AICTE and Shivaji University Norms.

**8. Duration, Teaching Schedule and Examinations:**

The duration of the course is three years divided into three parts of six semesters. The teaching for semester I, III and V will start from 1st Aug. to 15th Nov. (14 weeks) and the teaching for semester II and IV will start from 1st Jan. to 15th April (14 weeks) There will be semester end examination in December and June for all the semester. In addition there will be internal examinations for each paper conducted by the respective institutes/colleges.

**9. Standard of passing:**

- a. In order to pass the course, a candidate has to clear all the 36 heads of passing by getting a minimum of 40% in each head.
- b. There is no passing mark in the internal examination but the candidate has to score 40% marks separately in the University examination in each head. There is no separate internal examination for the absent candidates in internal examination.
- c. Subject to the condition of clearing in all 36 heads, in order to pass the course a candidate has to secure minimum of 50% in aggregate of all 36 heads
- d. Division Subject to the following condition of pass at the course to the condition(b) only
  - 50% and above but less than 60% -II class
  - 60% and above but less than 70% -I Class
  - 70% and above - I class with Distinction
- e. No class will be awarded to any part of examination

**10. Promotion Rules:**

- a. For admission to MCA Part-II Semester-III, candidate must clear all papers of Semester-I
- b. For admission to MCA Part-III Semester-V, Candidate must clear all papers of Semester-II and Semester-III
- c. For MCM to MCA upgradation program, candidate can take admission to Semester - IV and V by paying prescribed fees by university.

**11. Nature of question paper:**

Nature of question paper is as follows for University end semester examination

**a. Theory Examination:**

There will be six (6) questions of 15 Marks and out of which four (4) to be attempted. Question NO.7 is compulsory and is of short answers. Type. It must consist four (4) sub-question of 5 marks each of which two (2) to be attempted.

**b. Practical Examination:**

- i. Duration of Practical Examination : 3 Hrs

ii. Nature of Question Paper

There will be two questions of 30 Marks each of which each must have two sub Questions, out of which one sub-question is to be attempted. Both the questions are from two different practical subjects in that semester

iii. Distribution of marks

Journal-	20 Marks
Oral Examination	20 Marks
Practical Examination-	60 Marks

**12. Semester Seminar**

( Seminars in Semester I, III & IV)

The objective of the semester seminars is to give extra benefit to the students. i.e. student should learn additional topics on his own, which are other than the syllabus. Students are expected to collect literature pertaining to there topics from different books, magazine, research paper, journals etc. and present them in the form of seminars.

Distribution of Marks :

Seminars Reports-	40 Marks
Seminars Presentation-	60 Marks

Assessment of the seminar is to be internal and assessment should be done by a panel of teachers.

**13. Mini- Project**

The Objective of the mini project is to aware the student with current technology to be used in the IT industry. The topics of the mini-project to be selected from the subject studied in previous and present semester.

Distribution of marks:

Project Report-	50 Marks
Mini Project viva-	<u>50 Marks</u>
Total	100

**14. Software Development Project :**

The software project development is 5 months duration, and project to be completed in any software developing company or organization. The aim of the software project development is to make the student familiar with the industry's current software development environment. It is expected that student must select topics from the emerging trends in the industry.

Distribution of Marks:-

Internal - Project Report	- 200
External –University	
Project Presentation & viva-voce-	- <u>300</u>
Total	-500

**Proposed Syllabus of  
MASTER OF COMPUTER APPLICATIONS (MCA) COURSE  
(Under the faculty of Commerce)**

**Structure of MCA Course  
w.e.f Academic year 2007-08 and onwards**

**Semester- I**

Paper No.	Name of the subject	Int.	Uni	Total Marks	TH/week	PR/week
1.1	Computer Organization and Architecture	30	70	100	4	
1.2	Introduction to Management Function	30	70	100	4	
1.3	Statistical and Numerical Methods	30	70	100	4	
1.4	Procedure Oriented Programming with C++	30	70	100	4	3
1.5	Windows Programming with VB	30	70	100	4	3
1.6	Practical Lab on C++ & VB		100	100		
1.7	Seminar	100		100		
	Total	250	450	700	20	06

**Semester- II**

P.No.	Name of the subject	Int.	Uni	Total Marks	TH/week	PR/week
2.1	Operating System	30	70	100	4	
2.2	Accounting and Financial Management	30	70	100	4	
2.3	Software Engineering	30	70	100	4	
2.4	Object Oriented Programming Using C++	30	70	100	4	2
2.5	Data and File Structure	30	70	100	4	2
2.6	Practical Lab on OPP & DFS		100	100		
2.7	Mini Project	50	50	100		2
	Total	200	500	700	20	06

**Semester- III**

P.No.	Name of the subject	Int.	Uni	Total Marks	TH/week	PR/week
3.1	Computer Network	30	70	100	4	
3.2	Organizational Behavior and Business Communication.	30	70	100	4	
3.3	Decision Techniques	30	70	100	4	
3.4	Internet Computing	30	70	100	4	03
3.5	RDBMS USING Oracle	30	70	100	4	03
3.6	Practical Lab (Web design & Oracle)	--	100	100		
3.7	Seminar	100		100		
	Total	200	500	700	20	06

### Semester- IV

P.No.	Name of the subject	Int.	Uni	Total Marks	TH/week	PR/week
4.1	Unified Modeling Language	30	70	100	4	
4.2	Software Project Management	30	70	100	4	
4.3	Enterprise Resource Planning	30	70	100	4	
4.4	IT-Elective-I 4.4.1 Java Programming 4.4.2 Linux Programming 4.4.3 Programming in VC++ 4.4.4 Multimedia Programming	30	70	100	4	3
4.5	BM-Elective-I 4.5.1 Business Innovation 4.5.2 Network Security 4.5.3 Management Support System 4.5.4 Distributed Database System	30	70	100	4	
4.6	Practical Lab IT-Elective I		100	100		
4.7	Mini Project	50	50	100		03
	Total	200	500	700	20	06

### Semester- V

P.No.	Name of the subject	Int.	Uni	Total Marks	TH/week	PR/week
5.1	E-Commerce Applications	30	70	100	4	
5.2	Data warehousing and Data Mining	30	70	100	4	
5.3	IT Management	30	70	100	4	
5.4	IT-Elective-II 5.4.1 Dot Net Programming 5.4.2 SQL Server 5.4.3 Image Processing 5.4.4 Advanced Web Technology	30	70	100	4	
5.5	BM- Elective-II 5.5.1 Knowledge Management 5.5.2 Information System Audit 5.5.3 Cyber Law 5.5.4. Managerial Economics	30	70	100	4	
5.6	Practical Lab on IT-Elective II		100	100		6
5.7	Seminar	100		100		
	Total	200	500	700	20	6

### Semester- VI

P.No.	Name of the subject	Int.	University Viva- voce	Total Marks
6.1	Software Development Project	200	300	500

# Detail Syllabus

## Semester -I

### 1.1 Computer Organization and Architecture

1. Digital Logic Circuits- Digital Computers, Logic gates, Boolean Algebra, Map Simplification, Combination Circuits, flip-flops, and Sequential Circuits. (10)
2. Digital Components- Integrated Circuits, Decoders, Multiplexes, Registers, Counters, and Memory Unit. (03)
3. Data Representation- Fixed Point Representation, Floating Point Arithmetic, Base Conversion algorithms, Computer Arithmetic Addition and Subtraction Algorithms in various representations, Other Alphanumeric Codes, Error detection and Error Correction Codes. (07)
4. Basic Computer Organization and Design- Instruction Codes, Computer Registers, Computer instructions, Instruction cycle, Memory Reference Instructions, Input-Output instructions, and Interrupts, Design of basic computer. (07)
5. RAM, ROM, chips, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management, Hardware, Types and Characteristics of Memories, input/output Devices, Language Translators. (06)
6. Micro programmed Control: Control Memory, Address sequencing, Microprogram example, Design of control unit. CPU-General register organization, stack organization, instruction formats, Addressing modes, Data Transfer and manipulation, Program Control, CISC and RISC characteristics. (06)
7. Input-Output Processing-Peripheral devices, Input- Output Interface, synchronous Data Transfer, Modes of Data Transfer, Priority Interrupt, DMA, IOP, Serial Communication, Principles of I/O Hardware and Software. (06)

#### **References:-**

1. Mano M.M. Computer System Architecture, PHI Publication.
2. Rajaraman V. Fundamentals of Computers.
3. William Stallings, Computer Organisation & Architecture, Maxwell, Macmillan.
4. V.Carl Hamacher, Zvonko G. Vranesic, Sajwat G. Zaky, Computer Organisation, McGrawHill Publication.
5. P.Pal Choudhari, Computer Organisation & Design, Prentice Hall of India
6. George W. Gorshine, Computer Organisation, BHI.



## 1.2 Introduction To Management Functions

1. Human Resource Development: Behavioral aspects of MANAGEMENT – HRD selection, appraisal, training & information systems. [5]
2. Marketing Management: Concept – scope – relationship with other functional areas, Marketing – conceptual background of the four components i.e. product price, Place and Promotion, marketing Information System, Marketing Research and Organization. [10]
3. Financial Management : Concept, scope & its relationship with other functional areas, conceptual understanding of financial management – classification chart of the ratio's – fund flow analysis, ratio analysis, distinguish between fund flow and cash flow, working capital cycle, risk and return trade off (illustrations should be excluded) [10]
4. Manufacturing Management – Concept, scope and relationship with other functions – production system, production planning and control, concepts of materials management, quality management, quality concept and planning, standardization quality circles. [10]
5. Strategic Planning – concept, process and types of strategies, strategies and resources, industry structure and analysis, evaluation of corporate strategy, strategies for growth and diversification, process of strategic planning. [10]

### **Reference:**

1. Agarwal R.D. “Organization & Management” TATA MCGROW HILL 1986
2. Massie “Essentials of Management” 4<sup>th</sup> edition prentice Hall of India.
3. David Fred R. “ Strategic Management”, PHI
4. Thompson & Strickland, “Strategic Management”, 12Edition, TMH

## 1.3 Statistical and Numerical Methods

1. Introduction : Sampling: Population, sample, parameter, sample statistics, sample size, advantages of sampling methods, simple random sampling (with replacement & without replacement), Stratified sampling (proportional & Optimum). Cluster sampling [7]
2. Probability: Introduction, definitions of various terms, mathematical (classical) definition of probability, empirical (relative frequency, statistical), Definition of probability, concept of subjective probability, conditional probability, multiplication rule, total probability theorem, Bayes theorem and independence of events, geometric probability, algorithms to conduct random experiments and to determine empirical probabilities. [7]
3. Random variables – Definition, classification, distribution function, probability mass function, probability density function, expectation and variance, definition and properties of standard discrete and continuous distributions – Bernoulli, Binomial, Poisson distribution, Normal distribution and central limit theorem. [6]
4. Time series and sales forecasting, introduction of index numbers. [4]
5. Test of significance : Basic concept of hypothesis, Procedure of testing of hypothesis, Test of significance, Chi square test, Z test, T test. [5]
6. Finite difference, Newton-Gregory interpolation formulae for forward and backward interpolation, LaGrange's formula, Numerical differentiation. [5]
7. Numerical integration, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8<sup>th</sup> rule. [4]
8. Theory of matrices: types of matrices, Inverse by adjoint method, solutions of simultaneous linear equations (Homogeneous and Non-homogeneous) by Gauss elimination method, Gauss-Jordan Method, Jacobi's Method. [7]

### Reference:

1. Statistical Methods – S.C.Gupta
2. Statistical Analysis: A Computer Oriented Approach – Affi. A.A., Academic Press, New York, 1979
3. Computer oriented Numerical Methods – V. Rajaraman PHI
4. Computer oriented statistical & Numerical Methods – E.Balguruswamy – Mac.Millan, India.
5. A first course in Probability – S.Ross
6. Introduction to statistical Methods – J.Medhi.
7. Shanti Narayan, "Theory of Matrices."

## 1.4 Procedure Oriented Programming with C++

1. Introduction to algorithm, flowcharts, tracing flow charts, problem solving methods, Structure of C++ program, C++ language IDE. Data types, Variables and Constants, variables & scope, modifiers & storage class specify. (07)
2. Expressions, Operators & Assignment statements. (04)
3. Control flow and iterative structures. (06)
4. Arrays & pointers- Operators (\*, &), dynamic allocation of memory using new and delete, array as a pointer, pass by address to function, array of pointers. Function returning pointer, pointers to function, and pointer to structure. (07)
5. Functions & command line arguments- Function prototype, call & definition, Types of function calls, Recursion, Standard library functions. (07)
6. Formatted & screen Input / Output. (03)
7. Structures, unions & enumerated data types. (05)
8. File handling- Standard streams, Functions modes to open file, use of command line arguments to take I/P or O/P from/to file. Sequential and random file handling. (06)

### ***References :***

1. Robert Lafford, “ Programming in C++”
2. Rajaraman V., “ Computer Programming in C++”, PHI, 1995
3. Balaguruswami, “ Computer Programming in C++”
4. Ravichandran, “ Computer Programming in C++
5. Yeshwant Kanetkar, “ Let us C”

## 1.5 Windows Programming with VB

1. Introduction of Visual Basic -  
Concept of GUI Difference between Procedure oriented programming and event driven programming, starting and exiting from VB environment, understanding VB environment, Windows development, strength and weaknesses of VB, project explorer, properties window, Toolbox, form, layout window, code window, property pages, getting help, saving project, printing projects, connectivity to access. [10]
2. Naming Conventions, Variables & Data types -  
Byte, Boolean, Integer, Long, Single, Double, Currency, decimal, Date, Object, string variable & fixed length, Variant with numbers and characters, User defined variables with types, scope of variables – Global, Local, Static, Constants. [8]
3. Controls -  
Label and Textbox Controls, Command Button, control, Frame, Checkbox and Option button controls, List box and Combo box controls, Drive list box, directory list box, File list box, Msg. Box, Input box, Data base controls (ADO, RDO), Common Dialog box controls, Formatting controls, Control Arrays, Tab order. [8]
4. Functions -  
String functions, Mathematical function, Date functions, Data type, conversion functions, control statements – if then else statement, select case statement, Do statement, for next statement, While statement, Exit statement. [9]
5. Menu and Report -  
The origin of Menu, creating menus, selecting fonts from menu, adding code to menus, Adding Shortcut keys to mean. Report – Data from wizard, Data control, Data grid control, DB – combo box, Data Report, Crystal Report, Error handling. 10]

### Reference:

1. Visual Basic 6.0 – Peter Wright
2. Peter Norton's Guide to Visual Basic – 6.0 – Peter Norton
3. Visual Basic – 6.0 Programming – Hotzner Steven
4. Visual Basic – P.K. Macbride.

## 1.6 Practical Lab on C++ & VB

Laboratory covering usage of visual basic and procedure oriented programming in C++ with various exercise and mini case studies for every concept.

## 1.7 Seminar

The objective of the semester seminars is to give extra benefit to the students. i.e. student should learn additional topics on his own, which are other than the syllabus. Students are expected to collect literature pertaining to there topics from different books, magazine, research paper, journals etc. and present them in the form of seminars.

## SEMESTER-II

### 2.1 Operating System

1. Introduction : Evaluation of operating systems, types of operating systems, different views of operating system concepts and structure. [3]
2. Processes : The process concept system programmer's view of processes. The operating system view of processes. Operating system service for process management, schedule algorithms, performance evaluation. [4]
3. Memory Management: Memory management without swapping of aging, actual memory base of replacement algorithms design issues of paging of paging segmentation. [4]
4. Inter process communication and synchronization: The need for inter process synchronization, mutual exclusion, Semaphores, hardware support for mutual exclusion queuing implementation of semaphores, classical problems in concurrent programming, critical region and conditional critical region, monitor messages, deadlocks. [6]
5. File systems: File systems, directories file systems implementation, security protection mechanisms. [4]
6. Input/output: Principles of I/O hardware, I/O devices, drive controllers, direct memory access, principles of I/O software goals, interrupt handlers, device drivers, device independent I/O software. User space I/O software. [6]
7. Disk: Disk hardware, scheduling algorithms, Error handling, track-at-a-time caching, RAM disks, clocks, clocks hardware, clock software. Terminal: Terminal hardware, memory terminals, I/O software, processes and processors in distributed systems, Threads, system models, processors allocations, scheduling. [6]
8. Distributed file system: Design implementations, trends. [5]
9. Performance: Management, monitoring and evaluation, introduction, important trends affecting performance issue, why performance monitoring and evaluation are needed, performance measures, evaluation techniques, bottleneck and saturation feedback loops, case studies, DOS, WINDOWS, UNIX and Linex operating systems. [7]

#### **Reference:**

1. H.M. "An Introduction to Operating Systems", Addition Wesley publishing Co.,1984
2. nkpvie M., "Operating System concepts and Design" McGraw Hill, 1990 person I.L.
3. Abranam Silbrschat, "Operating System Concepts", Addition Wesley publishing Co., 1989.
4. Tenenbaum A.S., "Modern Operating Systems"

## 2.2 Accounting And Financial Management

1. Basic Accounting and conventions underlying preparation of financial statements (balance sheet, Highlighting accounting equation, profit and loss statement, accounting process, basic accounts, trail balance and financial statements issues such as provisions for bad debts tax dividends losses such as bad debts missing information, classification effect, cost of assets rental etc.) [6]
2. Income measurement (revenue recognition and matching costs and revenues inventory valuation) [4]
3. Depreciation accounting, intangible assets accounting, understanding published annual accounts including fund flow statement. [7]
4. Basic costs concepts: Introduction cost, classification, allocation, appointment and absorption costs centers.) Cost analysis for managerial decisions (direct costing break even analysis, relevant costs, pricing, pricing joint costs. make of buy, relevant fixed costs and sunk costs), Cost analysis for control (Standard costing variances, material, labour, overhead sales and profit), Standard cost accounting (budgeting and control of manufacturing and manufacturing expenses, performance appraisal, evaluation of costs control systems.) [10]
5. Introduction to management control systems: Goals, strategies and key variables, performance measures: responsibility centers and transfer price, investments centers. Reporting systems: Management by objectives, budgeting control, organizational relationships in control, control dynamics, top management and control strategic and long range planning, control of service organizations, control of projects, control of profit organizations, control of multinational companies. [9]
6. Accounting package, tally. [9]

### Reference:

1. Bhattacharya S.K. and Dearden John, "Accounting for Management", Prentice Hall of India, New Delhi.
2. Chanwick, "The Essence of financial accounting", Prentice Hall of India, New Delhi.
3. Horngren Sundem and Selio, "Introduction to Management Accounting", Prentice Hall of India, New Delhi.
4. Hilton and Gorden, "Budgeting Profit planning and control", Prentice Hall of India, New Delhi.

## 2.3 Software Engineering

1. Introduction: concept of software and software packages, difference between system, software and software packages. concept of structured system analysis and design methods, overview of software engineering. [5]
2. Software Development life cycle, Model of waterfall, spiral, prototyping, 4GL, concept of software requirement, specification (SRS), Characteristics of good SRS, proceeding techniques. Role of system analyst and role of users in system development, Feasibility study and risk analysis. [5]
3. Software Inspection Process: Software inspection, difference between software inspection and system audit, inspection process documentation. composition of the inspection team, check list, reading by the inspectors, recording of the defect and action, students should practice inspecting small requirement specification for good characteristics of software. [6]
4. Software Analysis & Design: Software analysis tools and techniques, DFD, ERD, project dictionary, difference between project dictionary and data dictionary. [5]
5. Software Design: software design tools and techniques, prototyping, structured, programming, programming styles – procedure oriented, object oriented and event driven programming with its features. User Interface Design: elements of good design, design issues, features of modern GUI, menus, scrolling, windows, icons, Panels, error messages, etc. [7]
6. User Manual : Concept of manual, user profile contents of an user manual, student is urged to install and use a software using its user manual and report the strengths and weakness of that user manual. [5]
7. Software configuration management: Base line, SCM process, version control, change item, change management. Computer Aided Software Engineering; CASE tools for project management prototyping maintenance future of CASE. Using any latest case tool for analysis and design and application software. [7]
8. Software Testing : Concept of software Testing , Types of Software Testing. [5]

### **Reference:**

1. “An integrated Approach to software engineering”, Narosa, 1991
2. “Software Engineering A practice approach”, McGraw Hill, 1992
3. “Software Engineering An Integrated Approach”, Jallote
4. Bently and Barlow, “System Analysis and Design Methods”, Galgotia.

## 2.4 Object Oriented Programming Using C++

1. OOP Concept: The object oriented approach, object oriented design, implementation in a object oriented languages, classes, objects, encapsulation, inheritance, Polymorphism, Dynamic binding, Message passing, Benefits and application of OOP introduction to C++. What is C++, application C++ , A simple program, Structure of C++ program, creating a source file, compiling and linking C++ technology, Token, Keywords, identifiers, basic data types and user refined data types, derived data types, symbolic constants, type compatibility, declaration of variables, Dynamic initialization of variables, reference variables, operators in C++, Scope resolution operator. [10]
2. Object and Classes: Introduction to structures, A simple class, member functions, structure within structures, Nesting of functions, array within a class, member allocation for objects, array of objects, simple functions, reference arguments, over loaded functions, inline functions, friend function, static function, constructors and destructors, parameterized constructor, multiple constructors in a class, constructors with default arguments, Dynamic initialization of object, copy constructors, Dynamic constructors, Destructor. [10]
3. Operators overloading : Definition, Unary and Binary operators, rules for overloading operators, concatenating strings, comparison operators, Arithmetic assignments operators, Type conversion, Inheritance- Derived class and base class. Derived class constructors, class Hierarchies, public and private inheritance, types of inheritance, program development. [12]
4. Pointers – The delete and new operator, pointers to object, an array of pointer to objects, pointer to pointers, Debugging pointers, difference between pointers and references, file and streams – streams, string I/O, character I/O file pointers, Error handling, redirection, command line arguments, printer output. [13]

### **References:**

1. Object oriented programming in turbo C++ - Robert Lafore
2. Mastering C++ - Venugopal
3. Object Oriented programming with C++ - E.Balagurushwami
5. C++ Programming – D.Ravichandran
6. C++ Primer , “Lip man and Lajole”, Addison Wesley Budd,”
7. Object Oriented Programming “, Addison Wesley.



## 2.5 Data and File Structure

1. Introduction to Data Structure – Abstract data type, ADT for varying – length, character string, Data structure and C++, Arrays – Arrays as an ADT, sorting and searching – sorting – concept of sorting, types of sorting – simple sort, bubble sort, Quick sort, insertion sort, and Radix sort, sorting applications, searching – concept of searching, linear search, binary searching, searching applications. [8]
2. Stack & Queues – Definition of stack and examples, representation of stack, infix, postfix and prefix notations, stack applications, Queues – Queues as an ADT, Implementation of Queues, Operations of queue, Priority queue, queues applications. [10]
3. Linked list & Tree – Definition operation on linked list, linked list as a stack and queue. Insertion into and deletion from a linked list, header linked list, Circular and double linked list, Tree-Binary trees, representation, Binary tree travels, threaded binary trees, tree operations, tree applications. [8]
4. Trees : Basic of hash function. Basic Terminology of trees, Binary Trees and their representation, expression evaluation, Complete Binary trees, Extended binary trees, Traversing binary trees, Searching, Insertion and Deletion in binary search trees, Complexity of searching algorithm, Path length, Huffman’s algorithm, General trees, AVL trees, Threaded trees, B trees. [8]
5. Graphs: Terminology and Representations, Graphs & Multigraphs, Directed Graphs, Sequential representation of graphs, Adjacency matrices, Transversal Connected Component and Spanning trees, Shortest path and Transitive Closure, Activity Networks, Topological Sort and Critical Paths. [6]
6. File Structure: Physical storage media, File Organization, Organization records into blocks, Sequential blocks, Indexing & Hashing, Primary Indices, Secondary Indices, B+ tree Index files, B tree index files, Static Hash functions, Indexing & hashing comparisons. [5]

### **Reference Books:**

1. File and Data Structure by A. Tanenbaum PHI
2. Data structures using C and C++ by Langsam, augenstein, Tenenbaum
3. Data structures through C by Dr.Sahani
4. Data Structure through C and C++ by Jagtap.
5. Horowitz and Sahani, “Fundamentals of Data structures”, Galgotia publications
6. An introduction to data structures and application by Jean Paul Tremblay & Pal G. Sorenson (McGraw Hill)
7. R.L. Kruse,B.P. Leary,C.L. Tondo, “Data structure and program design in C”, PHI

## 2.6 Practical Lab on OOP & DFS

Laboratory covering usage of OOPS and File Structure using C++ with various exercise and mini case studies for every concept.

### 2.7 Mini Project

The Objective of the mini project is to aware the student with current technology to be used in the IT industry. The topics of the mini-project to be selected from the subject studied in previous and present semester.

## SEMESTER-III

### 3.1 Computer Network

1. Advantages of network structure of the communications, network-point to point and multidrop circuits data flow and physical circuits network topologies and design goals. hierarchical topology, horizontal topology (Bus), star topology, ring topology. The telephone network switched and non-switched options, fundamental of communication theory, channel speed and bit rate voice communications and analog waveforms bandwidth and the frequency spectrum connecting the analog and digital worlds digital signals, the modern asynchronous and synchronous transmission. [8]
2. Wide area and local area networks connection oriented and connectionless networks, classification of communication protocols – time division multiple access (TDM), time division multiplexing (TDM), carrier sense (collision) system, token passing, peer-to-peer priority systems, priority slot, carrier sense (collision free) system, token passing (priority) systems. Layered protocols and the OSI model, Goals of layered protocols network design problems communication between layers. Layers of OSI, OSI status, Polling/Selection protocols. character & bit protocols binary synchronous control (BSC), HDLC, HDLC options, HDLC frame format code transparency and synchronization, HDLC transmission process, HDLC subsets, ADLC, Protocol conversion. [7]
3. Local Area Network: Why LANs? Primary attributes of a LAN, broadband and base band LANs IEEE LAN standards relationship of the 802 standards to the ISO/CCITT model, connection options with LANs, LLC and MAC protocol data units. LAN topologies and protocols CSMA/cd and IEEE 802.3 token ring (priority) token bus and IEEE 802.4 metropolitan area networks (MANs) ANSI fiber distributed data interface. [6]
4. Switching and routing in network: Message switching, packet switching, when and when not to use packet switching, packet routing, packet switching support to circuit switching networks [6]
5. The X.25 network and supporting Protocols: Features of X.25 layers of X.25 and the physical layer, X.25 and the data link layer, companion standards to X.25 features of X.25. X.25 channel options, flow control principles, other packet types, X.25 logical channel states packet formats, internetworking connectionless mode networks the frame relay and X.25 stacks. [7]
6. TCP/IP : TCP/IP and internetworking example of TCP/IP, operations related protocols and sockets, the IP address structure major features of IP. IP data gram, major IP service, IP source routing, value of the transport layer, TCP major features of TCP, passive and active operant the transmission control block (TCB) route discovery protocols examples of route discovery protocols applications layer protocols. [6]
7. Personal computer networks: Personal computer communications characteristics error handling using the personal computer as a server linking the personal computer to mainframe computers, file transfer on personal computers, common IBM PC LAN protocol search. [5]

#### Reference:

1. Black C “Computer networks protocols, standards and Interface”, prentice hall of India, 1996
2. stiling W, “Computer communication network” (4<sup>th</sup> Edition), prentice hall of India, 1993
3. Tanenbaum A.S. “Computer Network”, prentice hall of India, 1981

## 3.2 Organizational Behavior and Business Communication

1. Introduction to O.B.: Definition, Historical evaluation of OB, Learning organization, Types of learning organization. [4]
2. Micro perspectives of OB- Individual process & thinking, memory, learning, emotion, intelligence & ability, Personality- Meaning development of personality, socialization, personality & attitude, personality & emotion, motivating through job designing, & goal setting, Learning through reinforcement, learning through feedback, learning by observing, learning through experience. Macro perspective of OB- Organizational culture, Organizational change, Organizational development techniques. Organizational behaviour – A global approach, issue of culture, manage in diversity within and across the cultures. [8]
3. Micro & Macro dynamics of OB – Individual & interpersonal behaviour, work place emotions, values & ethics, individual conflict, interpersonal conflict, frustration, group dynamics & teams., Leadership, team building, team decision making. [7]
4. Communication – Concept & meaning of communication, barriers to communication, methods of communication, techniques to improve communication. Summarization- Techniques of summarize a given passage to test comprehension and ability to present written matter in a brief and concise manner. [6]
5. Basic official correspondence- Principles of correspondence, languages and style in official letter, formats of letters (complete-block, modified-block, semi-block), types of letters, writing curriculum vitae, bio data. [4]
6. Communication in a business organization- Internal and External Communication, strategies for conducting successful business meeting. Documentation of meeting. Introduction to modern communication techniques- email, internet, video conferencing etc., Legal and ethical issues in communication (Intellectual and property rights, patents). [4]
7. Advanced technical writing- Report writing & presentation, qualities of report, languages and style in reports, types of reports, formats, methods of compiling data. Technical paper writing, writing proposals. [4]
8. Soft-skills- Interpersonal skills- motivation, negotiating and conflict resolution, assertiveness, leadership, team building, decision making, time management. Interview techniques- Preparing for job interviews, verbal & non-verbal communication during interviews, observation sessions and role play techniques to be used to demonstrate interview strategies. Group discussion - Dynamics of group behaviour, techniques for effective participation. [8]

### References :

1. Organization Behaviour - Text, Cases, Games – Ashwathappa
2. Organization Behaviour - Concept & Controversies & Application – Stefen Robins
3. Organization Behaviour - Text, Cases, – Uma Shekharan
4. Business Correspondence and Report writing - R.C. Sharma& Krishna Mohan, TMH
5. Technical Communication – Anderson, Thomson
6. English for Engineers & Technologists- A Skill Approach- Humanities & Social Science Division, Anna University, Madras, Orient Longman
7. Technical Writing & Professional Communication – Huckins, Thomas.

## 3.3 Decision Technology

1. Introduction to operation research, importance and scope and applications, linear programming – description of the model, examples leading to LPP formulation, Graphical solution, Simplex algorithm, Duality problems, the Big-M method, Revised simplex and dual simplex methods, sensitivity analysis and applications. [8]
2. Special types of LPP problems such as transportation and assignment problems and algorithms to find then optimal solutions, travel salesman problem [7]
3. Decision Theory: Introduction, Decision under uncertainty, decision under risk, decision under certainty, decision tree, concept of minimax, maximin, EMV, EVPI, Network analysis, terminology of networks, shortest route problems minimal spanning tree problems, CMP and PERT analysis. [8]
4. Sequencing Models – Job sequencing with deadlines, processing of n jobs through 2 machines, three machines processing of 2 jobs through machines. [5]
5. Replacement Models – Replacement, policies for items that deteriorate with time replacement policies for items that fail completely, deterministic inventory models. [6]
6. Integer programming – Branch and bound techniques, application to traveling salesman problem, assignment problem, and 0/1 knapsack problem. [6]
7. Inventory control- Introduction, inventory control, selective control techniques, types of inventory, economic lot size problem, problem of EOQ with shortage, inventory control techniques – uncertainly demand, inventory control technique – stochastic problem, inventory control with price breaks. [5]

### Reference:

1. Taha H.A. operations research
2. Kanti Swarup, P.K. Gupta, Operation Research
3. Sharma J.K., operation research theory and application
4. Billy E.Gillett - Introduction to operation research
5. R.Panneerselvan, Operation Research

## 3.4 Internet Computing

1. The www Arena – www Server, www browser, HTTP, SGML, CGI, getting connection to the Internet & publishing your website. Introduction to HTML-Structure of HTML document Head and Body section elements, Image map creating server side & client side image maps, presenting information in tables, dividing the window, with frames, formatting your site with cascading style sheets, building interactivity with Forms, external files multimedia & animation looking to the future, changes to HTML & the web. [8]
2. Dynamic HTML – Introduction to Dynamic HTML, the Dynamic HTML object model. Dynamically changing text & styles, JavaScript style sheets, dynamically changing control and placement. [7]
3. JavaScript overview, JavaScript's object model, strengths and weaknesses of JavaScript, Building and extending objects in JavaScript, Events in JavaScript. Event-handlers, creating interactive forms introduction to cookies using cookies in JavaScript & storing users choices in cookies, encoding cookies. [8]
4. Browser objects – the object hierarchy, creating browser objects, working with window, document, history & location, browser detection, Java to JavaScript communication, JavaScript extensions for layers, security issue, JavaScript in your server working of server-side JavaScript, Server side language additions. [8]
5. Navigator gold – A JavaScript development tool, Java & JavaScript. [5]
6. An overview or Java – this keyword garbage collector in finalize(C) method. Introducing access control nested & inner classes, introducing final, inheritance Basics, exception handling, and multithreaded programming. [9]

### **Reference:**

1. HTML 4.0 – No experience required – E.Stephen Maok & Janan Platt.
2. Teach yourself web publishing with HTML 4 in 14 days 0 Laura Lemay
3. The HTML example book – Edward Farrar & Norman E.Smith
4. The Complete Reference HTML – Thomas A. Powell
5. Teach yourself Dynamic HTML in a week – Bruce Campbell & Rick Darnell.
6. The complete Java 2 – Pauric Naughton & Herbert schidt.
7. Learn Advanced JavaScript Programming – Ye huda Shiran & Tomer Shiran
8. Teach yourself JavaScript in 24 hours – Michael Moncur
9. The ABC's of JavaScript – Lee Purcell & May Jane Mara
10. The complete Java 2 certification guide – simon Roberts, Philip Heller Michael Lmest.

### 3.5 RDBMS USING Oracle

1. Basic concept: Database & database users, database system, concept & architecture, schema & instances, DBMS architecture, database languages & inferences, data modeling using E-R Approach. Conventional data models and systems, networking data model, Hierarchical database structure, Relational database design, Functional dependencies & normalization. [8]
2. Concurrency control & recovery techniques. Basic Concept of Object oriented Database, parallel database, distributed database. [4]
3. RDBMS – Concept of DBMS, Concept of RDBMS, Difference between DBMS and RDBMS, features of RDBMS, Introduction of Oracle, Historical Development of Oracle, Oracle configurations – OLTP, DDD, Data warehouse, Data Mart, Vide server, Role & responsibilities of oracle DBS, RDBMS Terminology – Relation, Tuple, Cardinality, Attribute, degree, Primary key, Domain Codd's rules, relational model, Integrity, Constraints, Functional Dependencies, Normal Forms, Boycecodd, Normal Form. [8]
4. Introduction to SQL – Features of SQL, starting up database, logging on to SQL plus Data types, classification of SQL commands, SQL table creation integrity constraints, insertion of records, select statement, alter commands, Drop Table Partitioned Table, SQL Operators – Transaction processing, where clause, Like Operator, Between Operator, Order by clause, GROUP BY clause. Having clause, SQL Functions – Arithmetic functions, Conversion functions, Miscellaneous Functions. [6]
5. Sub queries and Join-Sub queries, Multiple sub queries, N licit, Explicit open, close cursor, Introduction to Triggers-Block level, field level triggers, simple example to be solved with form. [6]
6. Forms & Menus – Basic concept of Form, Application development in Form, Creating a Form, Running a Form, Working with Master form, Maintaining standards in Forms, Master Detail Form, Libraries & Alerts, Menus-Using Default Menu, Using custom menu, Attaching a menu, Module to a menu Opening a Form through a menu. [8]
7. Reports-Features of report, Defining data module for a report, specify Runtime parameter form for report, features of D2K with application. [5]

#### Reference:

1. Database system concepts by A. Silberschaz, H. F. Korth, S.Sudarshan
2. An Introduction to Database system by Date C.J.
3. An Introduction to database concept, Desai S.
4. Commercial Application Development Using Developer 2000 by Ivan Bayross.
5. SQL by Scott Urman
6. Structured Query Language by Osborne
7. Teach yourself ORACLE 8 by Ed.Whalen.

### 3.6 Practical Lab (Web design & Oracle)

Laboratory covering usage of web design and Oracle with various exercises and mini case studies on every concepts.

### 3.7 Seminar

The objective of the semester seminars is to give extra benefit to the students. i.e. student should learn additional topics on his own, which are other than the syllabus. Students are expected to collect literature pertaining to there topics from different books, magazine, research paper, journals etc. and present them in the form of seminars.

## SEMESTER-IV

### 4.1 Unified Modeling Language

1. Brief history of UML, uses of UML phases of system development. overview of UML – views, diagrams, Model elements, UML extensions, Modeling Tools, Use-case modeling. [7 ]
2. Classes, objects and their relationships classes and objects, class diagrams, Relationships, associations, generalizations, Interfaces (protocols), Packages and templates, Quality of models, Dynamic modeling – State diagrams, Sequence diagrams, Collaboration diagrams, Activity diagrams, Real time modeling in UML – Real concepts, special real-time modeling concerns. [10 ]
3. Logical and physical architecture – Component diagram, Development diagrams, Extending UML – Tagged values and properties, constraints and stereotypes. [5 ]
4. Overview of the Booch method – Defining the problem, analysis, definition and evolution upgrading from Booch to UML. [5 ]
5. Overview of OMT method - conceptualization, Domain Analysis, Application Analysis, functional Analysis, Testing, System design, Object design, evolution, Upgrading from OMT to UML. [5 ]
6. A brief history of DBMS, concept of persistence, problems posed by persistent objects, using an RDBMS to solve persistent object, Designing an object database. [5 ]
7. Case studies in OO Development in detail to include – Foundation class libraries, container libraries, building, CASE tools and others. [8 ]

#### **References:**

1. Hans – Erik Erikson and Magnue Penker – UML Toolkit
2. AL Stevens – C++ Database Development
3. Lockheed Martin – Succeeding with the Booch and OMT methods
4. Ivar Jacobson – Object oriented Software Engineering
5. Ian Graham – Object oriented Methods
6. Robert C. Marrin – Designing Object Oriented C++ Application using the Booch method.
7. Rumbaugh et al – Object oriented modeling and Design
8. David E.Brumbaugh – Object – oriented Development Building CAASE tools using C++.
9. Grady Booch – Object oriented Analysis and Design with applications.

## 4.2 Software Project Management

1. **Project Management Framework:** Overview of project Management, Project Organization, Planning a s/w project, Project management life cycle, Risk management, Identification of Risks, Risk Analysis, Risk Planning & Monitoring. [6]
2. **Software Project Estimation:** Project Estimation, Different methods of estimation (COCOMO model, Delphi cost estimation etc.), Function point analysis. [5]
3. **Project Management Tools & Techniques:** PERT & Gantt Charts, Introduction to Microsoft Project. [5]
4. **Software Quality Management & Testing:** Quality Assurance & Standards, Quality Planning, Quality control, Role of testing in Software, development, Testing Procedure, Defect Management. [8]
5. **Configuration Management(CM):** CM planning, Change, Management, Version and Release, Management, Configuration, Management Tools. [7]
6. **S/W Team Management :** Characteristics of Performance management, High performance Directive and, collaborative styles, Team Structure, Team Communication, Managing customer expectations, Group Behavior.[8]
7. **Role of User in Projects:** User role in project management, User role in Various stages of S/W, Development, User role in System implementation.[6]

### Reference:

1. Software Project management By Edwin Bennatan
2. Software Engineering By Roger S. Pressman
3. Software Engineering concepts by Richard Fairley
4. Software Project Management by S.A. Kelkar
5. Software Engineering by IAN Sommerville
6. System Analysis and Design Methods By J.L Whitten , L.D.Bentley and K.C. Dittman



## 4.3 Enterprise Resource Planning (ERP)

1. Introduction of ERP, evolution of ERP, growth of ERP, ERP in India, evolution of ERP, MRP and MRP-II, Problems of system islands, need for system interaction and interface, early ERP packages, FRP products and markets, various models of ERP, Advantages of ERP. Overview of enterprise, integrated management, business modeling ERP for small business, ERP for order companies, business process for ERP module design, opportunities and problems in ERP selection and implementation, hardware Environment ERP implementation. [10]
2. ERP implementation identification of ERP benefits, team formation consultant intervention selection of ERP, process of ERP implementation managing changes in IT organization, preparing IT infrastructure, measuring benefits of ERP, integrating with other systems, post ERP, modules in ERP, Business modules of ERP package. [7]
3. ERP related technologies:- Business Process Reengineering(BPR), Management Information System(MIS), Executive Information System(EIS),Decision Support System(DSS), Supply Chain Management(SCM), Human Resource Management (HRM), ERP modules :- production ,finance, plant maintenance , quality management, material management, resource management. [8]
4. Packages and modules- ERP lifecycle , implementation of ERP packages, pre-evaluation, screening, project planning phase, pre-evaluation, gap analysis, Re-engineering, configuration, implementation ,team training, testing, going live, end user training, post implementation. Vendor, consultant and user, pros and cons of in-house implementation, vendor selection, consultant, end user. [8]
4. Future direction in ERP, new markets ,new channels, implementation, methodologies, business models, BAPI's, convergence on windows NT, application platform, new business segment, more features, web-enabling, market snapshot, industrial presentation. [7]
5. Introduction to ERP software :ERP market, SAP, BAAN, Oracle people soft, J D Edward world solution, system software association inc.(SSA),QAD, comparative assessment and selection of ERP . [5]

### **References:**

1. Sadagopan – ERP a managerial perspective ,TMH.
2. Alex Leon - Enterprise resource planning, TMH .
3. Loan, Alexix countdown 2000, Tata McGraw.
4. Plak, Carol, A., Eli Schragenheim, “ERP”, St.Lucie Press, NY, 2000
5. User manual – SAP R/3 .
6. User manual – BAAN VI

# IT-Elective-I

## 4.4.1. Java Programming

1. Introduction To Java, Getting Started With Java, Applets & Application , Creating A Java Applications, Creating A Java Applications, Creating Java Applets , Object Oriented Programming In Java, Object & Classes, Behavior & Attributes. Creating A Class, Inheritance Works, Single & Multiple Inheritance, Creating A Sub Class. (10)
- 2 Creating A New Object ,Accessing & Saving A Class & Instance Variable, Calling Methods, References To Objects, Campaigning Objects , Determining The Class Of An Object In Java Class Library. Arrays, Conditional Loops , How Applets & Applications Are Different In Creating Applets. Passing Parameters To Applets. (10)
- 3 Creating GUI Using The Abstract Windowing Tool Kit: Using Frames , Using Components, Events , Using Window Listener Interface ,Learning About Container Using Layout Managers & Handing AWT Events, The Graphics Class Drawing & Filling, Text & Fonts, Creating Font Objects, Using Color Objects, Creating Animation In Java, Threads : What Are They & The Need , Writing With Threads. (10)
4. Networking in java, Windows0, Menus & Dialog Boxes, Creating Links inside Applets, Opening Web Connection, the URL Connection Class, Sockets, Package, Programming in Large, Programming in Small, Heading Class, Interfaces. (8)
5. Exception, Creating and Using Threads, The runnable Interface, Thread Tester, Named Thread Tester, Thread Scheduling, Input Stream, Output Stream. (7)

### REFERENCES:

1. Java – Complete References.
2. Java A Premier – E Balgurusamy.
3. Java Programming (for absolute beginner) – Russell – PHI.
4. An Introduction to Object Oriented Programming with Java – Thomas Wu,TMH.
5. Java Programming For *Tim Absolute* Beginners - Rt&Sell
6. Java - Complete Reference
7. Mva A Primer-E Balgurusamy

## 4.4.2 Linux Programming

1. Functions and types of an Operating System, Overview of the Linux system, Architecture of Linux OS Single and compound Linux commands, Use Of C-programs, Study and use of Bourne shell - Shell variables, shell met characters, shell commands. (08 )
2. Shell scripts: Looping and making choices - for, case, while, until, if, test, shell script examples, use of expressions, countdown loop, printing of files, multiple options, passing arguments to scripts, shell commands. (12)
3. Internal representation of files - INODE - structure of a path name to an regular file - conversion of a path name to an INODE - superblock - allocation of disk blocks - file system calls - open - read - write - close - create - pipe - mount – un-mount - link - unlink. (10)
4. The structure of processes - Process state and - transitions - process context - sleep - wakeup - process control - fork - signals - exit - invoking other programs - the shell - system boot and INIT process - process scheduling and time clock. (10)
5. Study of Linux installation and System administration (05)

## **REFERENCES**

1. Professional Red Hat Linux: Naba Barkakati : Wiely dreamtech pub.
2. The design of the UNIX operating system- By Maurice J.Bach.
- 3 Redhat LINUX unleashed By Bill Ball.
- 4 Linux Operating system by NIIT
- 5 Using Linux By Jack Tackett, jr.and Steven Burnett –PHI (5<sup>th</sup> edi.)
- 6 Install configure and customize (Red Hat Linux 7) By Brian Proffitt-PHI
- 7 The complete Reference Linux –Peterson Richard-TMH.

## **Practical**

1. Write the procedure for each of the following:
  - a) Add a user account.
  - b) Modify a user account.
  - c) Change a user password.
  - d) Change the root password.
  - e) Disable a user account.
  - f) Enable a user account.
  - g) Delete a user.
  - h) Create a new group.
  - i) Delete a new group.
  - j) Modify group membership.
2. Write a shell script to check file exist or not if exist display its file type, size, and it contents
3. Write a shell script to create the nested directory and copy all files from home directory to nested directory.
4. Write a shell script to display message Good morning, Good afternoon and Good evening depending up on the system time.
5. Write a shell script to check whether the given number is prime or not prime
6. Write a shell script to accept the file and check whether it is present or not in the current working directory if it is check all file permissions.
- 7.a) Count the number of lines, words and characters in ls-l listing. Also count the number of character and words in any file of your home directory.  
b) Create a file with following data for 10 students.  
Name, Age, Roll-no, Percentage  
Now, sort this file on the fields percentage and display the results on screen.
- c)Store the contents of ls-l output into a file called list. And output of who into the file wo. Concatenate both the files into a single display and store it into another file called final. Display the contents of final.
8. a) List all the files starting from arrange of letters from C to G and the letter from T and simultaneously stored this listing in a file of list.  
b) Using grep command search for any pattern in all files of your home directory.  
c)Create a list of your choice and tryout the grep command to search for a particular pattern along with the following options.
  - i) Print only the count of lines that contains the pattern.
  - ii) Ignore upper/lower case distinction during comparison.
  - iii) Print all lines except those that contain the pattern.
9. a) In file
  - i) Display all the lines that began with a vowel.
  - ii) Display all the lines that do not begin with a vowel.
  - iii)Display all the lines that end with a specific pattern of your choice.  
b) Replace all lower case character of your files with upper case characters using the tr command.  
c) Delete a specified number of characters from your files using the tr command.  
d) Replace all occurrence of the character T in your file with a white space character.

## 4.4.3 Programming in VC++

### 1. Fundamentals of Windows and MFC:

Windows programming model, Event driven model, windows message processing, Message map, SDK, API, MFC, Allocation framework, Visual C++ Component, App Wizard/Class Wizard, writing console application, MFC collection classes, array classes, list classes and map classes. [6 ]

### 2. Graphics and Drawing:

The windows GDI, Device context, MFC device context classes, classes created in SDI (without doc/view support) application, application class, frame window, class, child viewclass, GDI objects, drawing different shapes, cpen, cbrush, cfont classes, displaying text in different fonts, stock objects, displaying shadowed text, mapping modes, coordinate conversions, moving the origin. Mouse programming, interactive line drawing free hand drawing, binary raster operations, foreground and background painting, painting using Cclient DC C windows DC and CpaintDC, loading a bitmap, displaying and stretching a bitmap, working of SDI application, Icons and cursors, menus, creating loading and displaying menus, checking/unchecking and unbalancing/disabling menu items, responding to menu commands, accelerators, toolbars status bars and rebars, adding tool tips and fly by text, context-sensitive menu, Pop-up menu. [10]

### 3. Dialogs and views:

Common dialogs, Cfiledialog, Ccolor Dialog, CfontDialog Cprint Dialog classes created in a dialog based application, windows common controls, interacting with the controls in a dialog control variables and value variables, Dynamic data exchange (DDX, DDV), Adding dialog controls at runtime, working of dialog based application, creating modal and modeless dialogs, user defined messages, setting windows properties through system parametersinfo() function, control notifications, property-sheets, different views classes like CScrollView, CEditView, CRichRditView, CformView, ChtmlView, etc. Usage of ActiveX controls in form view. [10 ]

### 4. Document / view architecture:

The document view architecture document view and frame, window object, file I/O and serialization, Building a SDI application, Double click support, Drag & drop support, command line execution, dirty flag, printing support, classes created in SDI application with Doc/View support, steps involved in opening and saving a file, Building a MDI application, static and Dynamic splitter windows, Dynamic link libraries (DLL), Database management with ODBC. [10 ]

### 5. Advanced C++:

Multithreading, Threads, processes, creating a worker thread, synchronization using critical section, events mutexes, semaphores, user-interface threads, socket programming Ssocket, CAsynSocket classes, internet programming using CInternet Session, ChtmlView, FTP programming Building a FTP client. [9]

### **Reference:**

1. Visual C++ Programming – Yashwant P.Kanetkar – BPB publications
2. Visual C++ 6, The Complete Reference – Papps & Murraray (TMH)
3. Visual C++ Handbook – Papps & Murray (TMH)
4. Programming Microsoft Visual C++, 5<sup>th</sup> Edition, David J. Kruglinski, George Shepherd, Scot Wingo, Microsoft Press 1998
5. Programming Windows with MFC-Jeff Prosise-Microsoft press

### **Practical List**

1. Building Console applications, collections classes, sorting of data.
2. Drawing shapes and fonts, mouse handling, creating menus, toolbars and status bars,
3. Context-sensitive menus and pop-up menu
4. Working with common dilogs, copy file, open file, colour dialog font dialog.
5. Programming common controls DDX, DDV mechanism
6. Creating internal Explorer/ View classes; Browser application
7. Dos/View architecture serialization, double click, drag & drop, Cmd line execution
8. Dirty flag, Printing support.
9. Creating a MDI application, spitter windows
10. Creating a DLL database management through using section and mutex
11. Using threads in an application, synchronizing threads critical section and mutex
12. Creating a chart application using sockets of ftp client.

## 4.4.4 Multimedia Programming

1. **Uses of Multimedia Information:** Introduction, What is multimedia?, Early, Hypertext and Collaborative Research, Multimedia and Personalized computing, Multimedia on the Map, Multimedia systems: The challenges. (05)
2. **The convergence of Computers, communications and entertainment Products:** Technology Trends, Multimedia Appliances: Hybrid Devices, A designers view of Multimedia Appliances, Industry Perspectives for the next decade. (03)
3. **Digital Audio Representation and Processing:** Uses of Audio in computer applications, Psychoacoustics, Digital Representations of sound, Transmission of digital sound, Digital Audio signal Processing, Digital music making. (05)
4. **Video Technology:** Raster Scanning Principles, Sensors for TV Cameras, Color Fundamentals, Color Video, Video Performance Measurements, Analog Video Artifacts, Video Equipment World wide Television Standards. (05)
5. **Digital Video and Image Compression:** Evaluating a compression System, Redundancy and Visibility, Video compression techniques, Standardization of algorithms, The JPEG Image compression standards on H.261 (p\*64), The MPEG Motion Video Compression Standards, DVI Technology. (05)
6. **Time Based Media Representation and Delivery :** Models of time, Time and Multimedia Requirements, Support for System timing Enforcement – Delivery. (05)
7. **Operating Systems support for continuous Media Applications:** Introduction, Limitation in Workstation Operating System, New Operating System support, Experiments using Real- Time Mach. (05)
8. **Middle Systems Services Architecture:** Goals of Multimedia Systems Services, Some views of the Multimedia Systems Services Architecture, Media Stream Protocol, E. G.: Audio and Video Capture with Synchronized Play. (05)
9. **Multimedia Devices Presentation Services and User Interface:** Multimedia services and the Window system, Client control of continuous media, Device control, Temporal Coordination and Composition , Toolkits, Hyper application (03)
10. **Multimedia Interchange:** QuickTime Movie File (QMF) format, OMFI, MHEG (Multimedia and Hypermedia Information Encoding Expert Group) Format Function and Representation Summary, Track model and Object Model Real-Time Interchange, Towards a Performance Model. (05)
11. **Multimedia Conferencing** Teleconferencing system, Requirements for multimedia communication, Shared Application Architectures and Embedded Distributed Objects, Multimedia conferencing Architecture. (2)

### References

1. Multimedia Systems - John F. Koegel Buford
2. Multimedia Computing Communications and Applications – Steinmetz
3. Multimedia in Practice - Jeffcoate.
4. Multimedia in action - James E. shuman Vikas
5. Multimedia and Web : Calleen Coorough, Vikas
6. Multimedia making IT work : T Vaughan, TMH
7. Multimedia, Making IT Work -Tay Vaughan Osborne McGraw Hill.
8. Multimedia Systems - Buford Addison Wesley.
9. Multimedia technology and Applications - David Hillman Galgotia Publications.

## **4.5 BM-Elective-I**

### **4.5.1 Business Innovation**

1. Business Process fundamentals: Definition of business processes, business processes and functional processes, importance of focusing on business processes. Understanding business processes, customer focused analysis of business processes, identifying value adding activities. [9]
2. Reengineering concepts: The emergence of re-engineering concept, concept of business process, rethinking of process, identification of re-engineering need, preparing for re-engineering implementing change. [7]
3. Types of reengineering, process improvement with cost reductions, achieving best-in-class with competitive focuses, radical change by re-writing the rules. Organizing for process improvements - setting up teams, choosing team leaders, training teams for process improvements. [6]
4. Organizing for Re-engineering: Obtaining top management commitment, creating cross functional teams, supporting teams with resources. Re-engineering Focus phase-identification of key processes, identification of key people and getting their support, identification of benefits possible and resources required. Re-engineering Design phase – selection of processes to be re-engineered, setting time frames, targets. Re-engineering Implementation phase – Communicating benefits for the organization, communicating the benefits for the individuals, monitoring progress, consolidating the gains. [10]
5. Benchmarking: Origin of benchmarking- Xerox approach, definition of benchmarking. Internal benchmarking - benchmarking against the best in unit, benchmarking against the best in group. External benchmarking - benchmarking the best in the industry, benchmarking the best in any industry. [8]
6. E-Business : Introduction to net technologies, E-Commerce, EDI and E-Business, Business opportunities, basic and advanced business models on internet, internet banking and related technologies, security and privacy issues, technologies for E-Business future and growth and E-Business. [5]

#### **References:**

1. Re-engineering Corporation - Hammer Michael and James Chamby 1997
2. Beyond Re-engineering - Hammer Michael
3. Business Process Benchmarking – Robert C. Camp
4. Process Re-engineering – Lon Roberts
5. Countdown 2000 - Loan, Alexix Tata McGraw.
6. ERP - Plak, Carol, A., Eli Schragenheim, St.Lucie Press, NY, 2000
7. Business Process Orientation – Kevin Mc Cormack, William C. Johnson

## 4.5.2 Network security

1. Introduction : Terminology, Notation, Networking, Attacks, layers and cryptography, authorization, tempest, keys, viruses, worms, trojan horses, multilevel model of security, legal issues. [6]
2. Cryptography : Introduction, breaking an encryption scheme, three kinds of cryptographic function, respective algorithms, standards and modes & operation, Hashes and messages.[6]
3. Authentication : Overview of authentication system protocols, keys, intermediaries authentication of people, security handshake pitfalls : login only, actual authentication, integrity / encryption for data, mediated authentication, performance consideration. [7]
4. Standards : Kerberos Vs : ASN.1, Names, Delegation of rights, Ticket lifetimes, Key versions, optimisations, algorithms, messages, Introduction to Real time communication security. IPSec, AH & ESP:Overview of IPSEC section, IP & IPV6, AH, ESP. [10]
5. E-mail Security : Distribution lists, store and forward, security services for e-mail, Establishing Keys, Privacy, Authentication of source, Message Integrity, Non repetition, Proof of Submission & delivery, confidentiality, anonymity, containment other issues, PEM & MIME, PGP. [8]
6. Firewalls : Packet filters, application level gateways, Encrypted tunnels, comparisons.  
Security Systems : Network V4, Windows. Web Issues : URLs, HTTP, Cookies, other Web Security problems. Other Security Measures. [7]

### References :

- 1) Network Security : Kaufman, Perlman, Speciner- (PE)
- 2) Network Security : Ankit Fadia (M)
- 3) Network Security Essential by Stallings - Pearson
- 4) Cryptography & Network Security by Stallings - Pearson



## 4.5.3 Management Support System

- 1 Introduction to MIS: Concept of MIS-Meaning, definition, nature, role need & importance, Evaluation of management through information system, management function, Decision making, MIS Design- MIS design methodology, detailed MIS design. [9]
- 2 Overview of CBIS applications, decision making concepts – A need of decision support, decision modeling, exercises, role of decision support systems in business, modeling in decision support, spread sheet software system as DSS tool, development of planning models in various functional areas, introduction to integrated financial planning system for financial modeling technology for marketing finance, executive information systems and their applications. [10]
2. Introduction to the concept of decision support system, components of DSS, Dialogue management, Data Management and model management for DSS example of different types of DSS system analysis and design for DSS models in the context of DSS. [9]
3. Algorithms and heuristics, DSS application in different functions, design of interfaces of DSS, an overview of DSS generators, Group decision support system and decision conferencing. [7]
4. Introduction of expert systems, expert system in management, case study on expert system, introduction to GIS, MSS based on GIS, case studies executive information systems. [10]

### **References:**

1. Davis, Michael W. Decision support, Englewood cliffs, New Jersey, Prentice Hall, India, 1990
2. Jayshankar, R. Decision support systems, New Delhi, Tata McGraw Hill 1989
3. Turban E decision support and expert systems 2<sup>nd</sup> Ed. New York, MacMillan, 1990
4. Bhatnagar, S.C. and Ramani K.V. “Computers and Information system”, Prentice Hall of India, New Delhi – 1992
5. Lucas, H.C. “Information system concepts for Management”, 5<sup>th</sup> Edition, McGraw Hill, New York 1994
6. Margan Alvi “Grouped decision support system information system Management”, Voll-8 No.3, summer 1991.

## 4.5.4 Distributed Database System

1. **INTRODUCTION** : Distributed data processing; What is a DDBMS; Advantages and disadvantages of DDBMS; Problem areas, Overview of database and computer network concepts. DDMS Architecture: Transparencies in a distributed DBMS; Distributed DBMS architecture; Global directory issues. DDB Design: Alternative design strategies; Distributed design issues; Fragmentation, Data allocation. [10]
2. **QUERY PROCESSING ISSUES**: Objectives of query processing; Characterization of query processors, Layers of query processing; Query decomposition; Localization of distributed data. Optimizing Distributed queries: Factors governing query optimization; Centralized query optimization, Ordering of fragment queries; Distributed query optimization algorithms. [10]
3. **DISTRIBUTED OBJECT MANAGEMENT** : Object model features; Fundamental object management issues, DOM architectures; Object caching; Object clustering; Object migration, Distributed object base systems. Query processing in Distributed Object base systems : Problems in accessing distributed objects; Distributed object assembly problem; Strategies for distributed object assembly. [8]
4. **TRANSACTION MANAGEMENT** : The transaction concept; Goals of transaction management, Characteristics of transactions, Taxonomy of transaction models. Transaction Management in Distributed Object base Systems : Additional demands of object base transactions, Transaction model extensions & alternatives, Classification of correctness criteria; Survey of object base transaction models. [9]
5. **CONCURRENCY CONTROL** : Concurrency control in centralized database systems; Concurrency control in DDBSs, Distributed concurrency control algorithms; Deadlock management. [5]
6. **RELIABILITY** : Reliability issues in DDBSs; Types of failures; Reliability techniques Commit protocols; Recovery protocols. [3]

### References:

1. M.T. Özsu and P. Valduriez. Principles of Distributed Database Systems. Prentice-Hall.
2. M.T. Özsu, U. Dayal and P. Valduriez (editors). Distributed Object Management. Morgan-Kaufmann.
3. S. Ceri and G. Pelagatti, Distributed Databases Principles and Systems, McGraw Hill Book Company.
4. A. Dogac, M.T. Özsu, A. Billiris, and T. Sellis (editors). Advances in Object-Oriented Database Systems. Springer-Verlag.
3. W. Kim (editor) Modern Database Systems: The Object Model, Interoperability & Beyond. ACM Press.

## 4.6 Practical Lab IT-Elective I

### 4.7 Mini Project

The Objective of the mini project is to aware the student with current technology to be used in the IT industry. The topics of the mini-project to be selected from the subject studied in previous and present semester.

## Semester V

### 5.1 E-Commerce Applications

1. E-Commerce : Perspectives of E-commerce, framework, information management, EC on private networks, EDI, EC on web, EC adoption, issues, applications, future. EC practices, b2b, b2c, c2c, b2g, g2b, g2b, g2c benefits, limitations, EC payment, transactions, EC model, EC for B2B & e-governance. [5]

1. **ELECTRONIC PAYMENT SYSTEM**

Overview of electronic payment technology, Electronic or digital cash, electronic cheques, Online credit card-based systems, consumer legal and business issues. [07]

2. **ELECTRONIC COMMERCE AND BANKING**

Changing dynamics in the banking industry, Home banking – History, Home banking implementation approaches, Open VS, closed models, Management issues in online banking, Online customer services and support, Technology & marketing strategies. [10]

3. **ELECTRONIC COMMERCE AND RETAILING**

Changing retail industry dynamics, Online retailing success story, Mercantile models from the consumer's perspective, management challenges in online retailing. [06]

4. **ELECTRONIC COMMERCE AND ONLINE PUBLISHING**

Why online publishing? Online publishing approaches, online publishing success stories, advertising and online publishing. [07]

5. **INTRANETS AND SUPPLY – CHAIN MANAGEMENT**

Supply-chain management fundamentals, Managing retail supply chains, supply chain application software, future of supply chain software. [06]

6. **INTRANETS AND MANUFACTURING**

Defining the technology, emerging business requirements, manufacturing information systems, intranet-based manufacturing, logistics management, electronic data interchange. [07]

#### References:

1. Electronic commerce – Ravi Kalakota and Andrew Whinston PERSONS
2. Beginning E-commerce – Matthew Reynolds Shroff publishers & distributors
3. The E-Biz primer How to design profitable websites and portals -Alexis Leon and Mathes Leon
4. Web Commerce Technology Handbook -Daniel Minoli McGraw Hill International
5. E-commerce -Deepak Goel, S.Chand
6. E-commerce, Business on the Net Kmalesh Agarwal McMillan
7. E-commerce, The Cutting Edge of Business Bajaj and Nag Tata McGraw Hill.

## 5.2 Data Warehousing and Data Mining

1. Data Mart, Metadata for a data Mart, Data Model for a Data Mart, Maintenance of a Data Mart, Nature of Data in Data Mart, Software Components for a Data Mart, Tables in Data Mart, External Data Reference Data, Performance issues, Monitoring requirements for a Data Mart, Security in Data Mart. [5]
2. OLTP and OLAP systems: Data Modeling, Star Schema for multidimensional view, multifact star schema, categories of OLAP tools, Managed Query Environment(MQE), cognos powerplay, IBI Focus Fusion, Pilot Software, Arbor Web, Information advantage web OLAP, Micro strategy, DSS web, Bric Technology, OLAP tools and the Internet.[7]
3. Data Mining: Introduction- What is Data Mining, What can Data Mining do? The Business Context for Data Mining, The Technical Context for Data Mining, the societal context for Data Mining, four approaches for Data Mining steps of data mining, data mining algorithm, Database segmentation, predictive modeling, link analysis, tools for data mining. [5]
4. Two styles of Data Mining, The Virtuous Cycle Of Data Mining, Identifying The Right Business Problem, Transforming Data Into Actionable Results, Acting On The Results, Measuring The Models Effectiveness, What Makes Predictive Modeling Successful? [5]
5. Different Goals For Different Techniques, Three Data Mining Techniques, Automatic Cluster Detection, Decision Trees, Neural Networks. [5]
6. Developing Data Warehouse: Building a Data Warehouse, Data Warehouse architectural strategies, Design considerations, Data content, metadata, distributed data, Tools for Data Warehousing, performance considerations, Crucial decisions in Designing a Data Warehouse, various technological consideration [8]
7. Applications: Applications of Data Warehousing and Data Mining, National Data Warehouses, Census data, Areas of Data Warehousing and data mining with following case studies -  
Case Study –
  1. Data Warehousing in State Government
  2. Data Warehousing for Ministry of Commerce
  3. Data Warehousing in Hewlett-Packard
4. Data Warehousing in world Bank [10]

Note: A Group of 10 Students be allocated one of the above case study and present in the class.

### References:

1. Data Warehousing – C.S.R. Prabhu, PHI Pub.
2. Data Warehousing & Knowledge Management - Mattison, TMcGH
3. Data Warehousing – Ametesh Sinha, Thoson Publication
4. Data Mining – Claude Seidman, PHI Publication.
5. Mastering Data Mining – Michael J. A. Berry & Gordon S. Linoff (WILEY publ.)

## 5.3 IT Management

1. Organization of IT Department – set up , roles & responsibilities , Interfacing with other functional departments , Functions of IT Management Department. [6]
2. IT Assets & its Management – Data – Access rules , Confidentiality of Data, Back up procedure . [6]
3. Hardware – Acquisition, deployment, maintenance, security, upgradation – Inventory of IT Assets [7]
4. Software – Acquisition of System & Application Software, Deployment of application software , Change Management, Version control, maintenance of application software System Software Licensing issues–Licensing options– Concurrent , campus etc. [7]
5. Infrastructure – Networking its security, Power Back up issues – UPS capacity assessment. [7]
6. IT Professionals- Recruitment, Background checking, segregation of duties, compulsory vacation etc. [3]
7. IT Resource Management – Budgeting, Monitoring, Outsourcing administration IT strategy for Protecting IT investment, Changeover Technology, IT –Security. Organizational Rules & Policies for IT standards. Business Strategy vis -a -vis IT Strategy Critical issues in IT asset management – Case studies. [9]

### References

1. Information Technology for Management : henry C. Lucas Jr. Tata McHill
2. Information Technology Planning – Lori A.Goetsch - Jaiko Books
3. Planning & Financial Management of IT–Frank Bakhister–British Library catalogue in Publish of Data
4. Information Technology for Management – John Wiley & SMS ( ASIA ) PAC Lts. Singapore
5. Management of Technology – Zafar Husain Sushil ,RD Patnaik , ANMOL Publication Pvt.Ltd., New Delhi -110002

## IT-Elective-II

### 5.4.1 Dot Net Programming

- 1. Dot net framework :** Introduction to .NET, Evolution of .NET platform, advantages & of working of .NET, .NET framework, common language runtime(CLR), Active Server Pages-Basic Architecture of .NET framework, common language specification, understanding unified programming classes, security in .NET —languages and web support (C#, VB.NET, cript.NET, Web support for .NET, Web Services) [12]
- 2. Introduction to ASP.NET :** Introduction to ASP.NET, Features of ASP.NET, structure of an ASP.NET page, creating simple web applications using database Connectivity, web service using common web controls. [12]
- 3. Professional ASP.NET Skills :** Security of Web Site using SSL(Secure Socket Layer), Use of Digital Secure Certificate, login Controls-Authentication & authorization, Application of SSL(A Halloween), Configure & deploy a Web application. [10]
- 4. Developing reusable code :** Introduction to user controls and customer server controls (rendered control, web control library, super classed control, composite control) Basic concepts and terms in creating web services. [11]

#### References:

1. Nitini Pandey, Yesh Singhal, Mridula parihar, "Visual Studio.Net Programming", Wiley-Dream Tech India(p) Ltd, 2002
2. David Sceppa, "Microsoft ADO.NET (Core Reference), Microsoft Press, 2002.
3. Nikhil Khothari, Vandana Datye "Developing Microsoft ASP.NET Server Control and Componentsw", Tata MaGraw Hill publisihing company limited, 2003.
4. E. Balagurusamy, "Programming in C#" TMH, 2002.
5. Steven Holzner, "Visual Basic.NET Black Book", Coriolis Group Books.

## 5.4.2 SQL Server

- 1. Overview of SQL :** SQL Language, Role of SQL, SQL features & benefits, Simple Database, Retrieving Database, Summarizing Database, Adding data to database, Deleting-Updating-Protecting Data, Creating Database, SQL and Database Management, SQL Standards, SQL & Networking, The Proliferation. (8)
- 2. SQL Basics & Queries:** Statements, Names, Data Type, Constants, Expression, Built-in functions, Missing Data, Queries-Select Statement, Query Result, Simple Query, Duplicate Row, Row selection, Search Selection, Sorting query results, Rules for single table, Multiple table queries, Summary queries, Sub queries and queries expression. (10)
- 3. Updating Data:** Adding data to database, Deleting data from database, and Modifying data in Database. Transaction processing-Transaction and Multiuser processing, Locking levels, Shared and Exclusive locks, Deadlocks, Advanced Locking Techniques. (7)
- 4. Database Structure :** Creating a Database, Data definition language, Table definition, Constraint definition, Aliases& Synonyms, Indexes, Managing Database Objects, Database structure, Database Structure & the ANSI/ISO Standards, SQL Security. (10)
- 5. Programming with SQL :** Embedded SQL, Programmatic SQL Techniques, Simple embedded SQL Statements, Data retrieval in Embedded SQL, Cursor based deletes and updates, Cursor and Transaction Processing. (10)

### References:

1. SQL: The Complete Reference by James Groff & Paul Weinberg TMH.

## 5.4.3 Image Processing

1. Introduction Digital Image Processing – problems and applications, image representation and modeling, image enhancement, image restoration, image analysis, image reconstruction from projection, image data compression, 2D systems and mathematical preliminaries – linear systems shift results, block matrices and kronecker products, random signals, discrete random fields, spectral density function, mean square estimates, orthogonality principle, information theory entropy and rate distortion function. [6]
2. Image perception: Light, luminance, brightness and counteracts, MTF of visual system, visibility function, monochrome vision model, image fidelity criteria, color representation co-ordinate system difference measures vision model, temporal properties of vision. [7]
3. Image sampling and quantization introduction, 2D sampling theory and extensions, practical limitations in sampling and reconstruction, image quantization, optimum mean square quantizer, visual quantization. [7]
4. Image transforms 2D orthogonal and unitary transforms and their properties, discrete Fourier transform cosine, sine, hadamard, haar, slant KL transforms. [6]
5. Image enhancement: point operations histogram modeling spatial operations, transform operations, multi spectral image enhancement, color image enhancement. [7]
6. Image analysis and computer vision: spatial feature extraction, transform features, edge detection, and boundary extraction. [7]
7. Introduction to image reconstruction from projections and image data compression. [8]

### **References:**

1. Gonslaz et al “Digital image processing Addison Wesley, Reading M.A. 1990”
2. Anil K. Jain fundamentals of digital image processing PI II 1995.



## 5.4.4 Advanced Web Technology

- 1 Servlets in Java, Introduction, Servlet structure & Lifecycle. Servlet API basics : Various classes & interfaces. Servlet requirements & writing. Running and debugging of servlets : Servlet Debug class. [8]
- 2 HTTP Redirects & Servlet API, Concept of cookies, Servlets & cookies. State and session management with servlet API. Server side includes and request forwarding. Servlet chaining. Jdbc servlets. [7]
3. Introduction to XML; writing XML, creating a DTD, elements & attributes definitions. XML Schema. Defining simple & complex types. Name spaces, schemas and validation. [8]
4. Cascading style sheets (CSS) & XML; anatomy of a style, creating and calling stylesheets for an XML/HTML document. Layout with CSS : setting up various properties of elements using CSS. Formatting text with CSS. [8]
5. Introduction to JSP : Simple JSP & concepts, Request-time ex-pressions. Concept of Beans, Bean instances & serialization; Advanced JSPS : Scriplets, conditionals, Loops, Try/catch, Beans & Scriplets. [7]
6. Bean scopes, writing Beans. Jdbc & Beans. Dynamic Ads and E-commerce concepts. Using scopes from Servlets, Using Beans from servlets. JSP classes, JSPs and XML. [4]

### References :

1. Dustin.R. Callaway : Inside Servlets Pearson Education(LPE)
2. Elizabeth Castro : XML for WWW Pearson Education(LPE)
3. Larné Pekowsky : Java Server Pages Pearson Education(LPE)
4. Dietel & Dietel : WWW:How To Programm Pearson Education(LPE)

## 5.5 BM- Elective-II

### 5.5.1 Knowledge Management

1. Knowledge – Definitions of knowledge, data, information & knowledge wisdom, basic types of knowledge, knowledge analysis, knowledge life cycle, value of knowledge, knowledge acquisition tools, global knowledge economy. Organizational knowledge – types, capital classification, sources, processes, creation, indexing, knowledge conversion, organizational knowledge, organizational knowledge, organizational knowledge mapping techniques. [5 periods]
2. Knowledge Management – Definitions & specification, levels, targets, classification, information management & knowledge management, generation of knowledge management, knowledge management as best practices systems, knowledge Management strategy, knowledge management and culture. [6 periods]
3. Organizational knowledge Management – need, benefits, drivers, approaches, strategies, components and functions, knowledge management in virtual organizations, knowledge management in the professions – a study of I.T. support in business. knowledge management systems – issues, challenges and benefits. [7 periods]
4. Designing Enterprise knowledge management systems architecture – a multi-layer architecture for knowledge management systems, knowledge management in decentralized heterogeneous corporations, Web-based knowledge management support for document collections. [10 periods]
5. Organizational knowledge management architecture and implementation strategies developing knowledge management framework, knowledge management system requirements knowledge management system components, KM applications organizational collaborative platforms. Organizational knowledge management framework, organizational knowledge measurement techniques, Organizational implementation barriers. [8 periods]
6. Intelligent support systems – Intelligent systems and A.I., comparing artificial and neural intelligence, conventional Vs A.I. Computing Fuzzy logic, Emerging technology – virtual reality. [5 periods]
7. Intellectual capital – Introduction, Social innovation capital, false linearity, false orientation, case studies. [5 periods]

#### **References:**

1. Knowledge Management – Sudhir Warier Vikas Publications
2. Knowledge Management Systems – Stuart Barncs, Thomson Learning
3. Key Issues in the New Knowledge Management – J.M.Firestone, M.W. Mcelroy.
4. Developing Expert system for Business – Chandier / Liang
5. Knowledge Management – Pankaj Sharma APH Pub.

## 5.5.2 Information System Audit

1. IS Audit :- Definition, Concept, importance, Audit Charter , IS Audit standards , Audit Planning , Risk assessment , Information gathering techniques , Vulnerability , System Security testing , Conducting IS Audit, Generalised Audit software ( GAS) Use of Computer Assisted Audit Tool ,( CAAT) Specialised Audit Software , Benefits of IS Audit to the organizations. [7]
2. Internal control & Information System audit : Control framework - COBIT , Types of controls – Internal , Preventive , Detective , Corrective , Compensatory Audit Evidence – Types , methods. [5]
3. Business Continuity Planning Disaster recovery planning –Introduction , Need for Business continuity planning ( BCP ) and Disaster Recovery Planning ( DRP) BCP vis-a-vis DRP, Business Impact Analysis , Auditing the BCP , DRP. [5 ]
4. Introduction to Security: Need for security and control, risks to information systems data and resources, Definitions of information security, computer crimes and virus, Internal control, types of security, physical security, threats to security, physical access, fire and theft protection environment hazards: Logical Security; threats to security access control – identification, authentication, authorization, password control and management access control software. [6]
5. Operating System Security: Protected objects and methods of protection, Memory address protection, Control of access to general objects, File protection mechanism, Authentication: Authentication basics, Password, Challenge-response, Biometrics. Computer Configuration and operation security: Hardware/Software security, start up / shut down procedures, journals, back-up / recovery strategies: personal security, protection from people, protection of employees. [7]
6. Data Security: Threats to security, access controls, Back-up and recovery strategies, Data input/output control Data encryption. Tele-communication Security: Physical security, logical access security, Dial in access security, network management control, authentication protocols, internet/intranet security. [5]
7. Security Planning : Risk and security policy, security management, business continuity planning security audit. Legal, Privacy, and Ethical Issues in Computer Security: Protecting programs and data, Information and law, Rights of employees and employers, Software failures, Computer crime, Privacy, Ethical issues in computer society, Case studies of ethics. [5]
8. Adminstrating Security- Security planning, Risk analysis, Organizational security policies, Physical security IT security policy - formulation, Implementation of Security policy [5 ]

### References:

1. EDP auditing by Ron Weber
2. Enterprise security – protecting information assets by Michel E.Kabey
3. Eric Maiwald, “Network Security : A Beginner’s Guide”, TMH
4. C. P. Pfleeger, and S. L. Pfleeger, “Security in Computing”, Pearson Education.
5. Wtátt Bishop, “Computer Security: Art and Science”, Pearson Education.
6. C. P. Pfleeger, and S. L. Pfleeger, “Security in Computing”, Pearson Education.
7. Stallings, “Cryptography And Network Security: Principlles and practice”
8. Whitman, Mattord, “Principles of information security’ Thomson
9. Information System control & Audit –Ron Weber , Pearson Education
10. System Audit – Revathi Sriram

### 5.5.3 Cyber Law

1. Object and Scope of the IT Act: Genesis, Object, Scope of the Act [5]
2. Encryption: Symmetric Cryptography, Asymmetric Cryptography, RSA Algorithm, Public Key Encryption. [5]
3. Digital Signature: Technology behind Digital Signature, Creating a Digital Signature, Verifying a Digital Signature, Digital Signature and PKI, Digital Signature and the Law. [10]
4. E-Governance and IT Act 2000 : Legal recognition of electronic records, Legal recognition of digital signature, Use of electronic records and digital signatures in Government and its agencies. [7]
5. Certifying Authorities : Need of Certifying Authority and Power, Appointment, function of Controller, Who can be a Certifying Authority?, Digital Signature Certifications, Generation, Suspension and Revocation Of Digital Signature Certificate. [6]
6. Cyber Régulations Appelâtes Tribunal : Establishment & Composition Of Appellate Tribunal Powers of Adjudicating officer to Award Compensation, Powers of Adjudicating officer to Impose Penalty. [6]
7. The Cyber Crimes : Tampering with Computer Source Documents, Hacking with Computer System, Publishing of Information Which is Obscene in Electronic Form, Offences : Breach of Confidentiality & Privacy, Offences : Related to Digital Signature Certificate. [6]

#### **Reference:**

1. Cyber Law in India by Farooq Ahmad – Pioneer Books
2. Information Technology Law and Practice by Vakul Sharma – Universal Law Publishing Co. Pvt. Ltd.
3. The Indian Cyber Law by Suresh T Vishwanathan – Bharat Law house New Delhi.
4. Hand book of Cyber & E-commerce Laws by P.M. Bakshi & R.K.Suri – Bharat Law house New Delhi.
5. Guide to Cyber Laws by Rodney D. Ryder – Wadhwa and Company Nagpur.
6. The Information Technology Act,2000 – Bare Act – Professional Book Publishers – New Delhi.

## 5.5.4. Managerial Economics

1. INTRODUCTION: Nature and scope of economics, Link between economics and managerial economics need, objective and application of managerial economics, Basic concept in managerial economics - firm, its objective, distinction between firm and industry. (07)
2. DEMAND ANALYSIS AND DEMAND FORECASTING: Demand - Meaning, Purpose, Concept & law of demand. Demand elasticities Methods of demand forecasting. (08)
3. PRODUCTION ANALYSIS: Production Function - Isoquants and Isocost concept - Short run and Long run production and law of valuable proportion and law of returns to scale, -Economics of scale. (07)
4. COST CONCEPT AND COST ANALYSIS: Concepts of costs fixed, variable, opportunity cost etc. Cost function - cost & output relationships cost curves - Break even analysis. (08)
5. THEORY OF PRODUCT PRICING : Price and output determination in different market situations - Perfect competition, Monopoly, Oligopoly and Monopolistic competition. models of different market structures. (08)
6. SOFTWARE ECONOMICS : Nature and Scopes of software economics - software engineering and software economics - Mathematical models in software economics and model dynamics - Mode, simulation and returns estimation Transfer pricing - Other applications. (07)

### REFERNCES:

1. DWIVEDI. D. N., "Managerial Economics", Vikas Publications House Pvt. Ltd. New Delhi, 1998
2. LEON. S. LEVY, "Training the Tiger : Software Engineering and software economics", Springer verlag, london, 1987
3. DEAN. J., "Managerial Economics", PHI, New Delhi, 1980
4. MOTE. V. L., "Managerial economics Concepts and Cases", Tata McGraw hill, New Delhi, 1980
5. GUPTA. G. S., "Managerial Economics" , Vikas Publishing House, New Delhi 1992.

## 5.6 Practical Lab on IT-Elective II

### 5.7 Seminar

The objective of the semester seminars is to give extra benefit to the students. i.e. student should learn additional topics on his own, which are other than the syllabus. Students are expected to collect literature pertaining to there topics from different books, magazine, research paper, journals etc. and present them in the form of seminars.

## Semester VI

### 6.1 Software Development Project

The software project development is 5 months duration, and project to be completed in any software developing company or organization. The aim of the software project development is to make the student familiar with the industry's current software development environment. It is expected that student must select topics from the emerging trends in the industry.

**Proposed Syllabus of**  
**MASTER OF COMPUTER APPLICATIONS (MCA) COURSE**

(Under the faculty of Commerce)  
w.e.f Academic year 2007-08 and onwards

**Equivalence of MCA Course**

**Semester- I**

<b>Old Syllabus</b>		<b>New Syllabus</b>	
<b>Paper No.</b>	<b>Name of the subject</b>	<b>Paper No.</b>	<b>Name of the subject</b>
1.1	Elementary Algorithm	1.4	Procedure Oriented Programming with C++
1.2	Computer Organization and Architecture	1.2	Computer Organization and Architecture
1.3	Procedure Oriented Programming with C++	1.4	Procedure Oriented Programming with C++
1.4	Introduction to Management Functions	1.2	Introduction to Management Functions
1.5	Mathematical Foundation	1.3	Statistical and Numerical Methods
1.6	Programming in Visual Basic	1.5	Windows Programming with VB
1.7	Practical Lab on C++ & VB	1.6	Practical Lab on C++ & VB

**Semester- II**

<b>Old Syllabus</b>		<b>New Syllabus</b>	
<b>Paper No.</b>	<b>Name of the subject</b>	<b>Paper No.</b>	<b>Name of the subject</b>
2.1	Theory of DBMS	3.5	RDBMS using Oracle
2.2	Operating System	2.1	Operating System
2.3	Object Oriented Programming and Data Structure	2.4, 2.5	Object Oriented Programming Using C++ Data and File Structure
2.4	Accounting and Financial Management	2.4	Accounting and Financial Management
2.5	Software Engineering -I	2.3	Software Engineering
2.6	RDBMS (Oracle)	3.5	RDBMS using Oracle
2.7	Practical Lab on Oracle & C++	2.6	Practical Lab on OPP & DFS

**Semester- III**

<b>Old Syllabus</b>		<b>New Syllabus</b>	
<b>P.No.</b>	<b>Name of the subject</b>	<b>P.No.</b>	<b>Name of the subject</b>
3.1	Internet Programming	3.1	Internet Computing
3.2	Computer Communication & Networks	3.2	Computer Network
3.3	Software Engineering-II	4.2	Software Project Management
3.4	Business Communication and Organizational Behavior	3.4	Organizational Behavior and Business Communication.
3.5	Statistical Computing	1.3	Statistical and Numerical Methods
3.6	Computer Graphics	4.4.4	Multimedia Programming
3.7	Mini Project	2.7	Mini Project

**Semester- IV****Old Syllabus****New Syllabus**

<b>P.No.</b>	<b>Name of the subject</b>	<b>P.No</b>	<b>Name of the subject</b>
4.1	Theory of Computer Science	4.5.2	Network Security
4.2	Decision Technology	3.3	Decision Techniques
4.3	UML & Design Pattern	4.1	Unified Modeling Language
4.4	IT-Elective-I	4.4	IT-Elective-I
4.4.1	Active Server Pages	4.4.1.	Java Programming
4.4.2	Web Designing	5.4.4	Advanced Web Technology
4.4.3	Digital Image Processing	5.4.3	Image Processing
4.4.4	Unix Programming	4.4.2	Linux Programming
4.5	BM-Elective-I	4.5	BM-Elective-I
4.5.1	Financial Services in Banking	5.5.4	Managerial Economics
4.5.2	Management Support System	4.5.3	Management Support System
4.5.3	Business Innovation	4.5.1	Business Innovation
4.5.4	Information System Audit	5.5.2	Information System Audit
4.6	Practical Lab IT-Elective I	4.6	Practical Lab IT-Elective I
4.7	Mini Project	4.7	Mini Project

**Semester- V****Old Syllabus****New Syllabus**

<b>P.No.</b>	<b>Name of the subject</b>	<b>P.No</b>	<b>Name of the subject</b>
5.1	Data warehousing and Data Mining	5.2	Data warehousing and Data Mining
5.2	Performance Evaluation of Computer System	5.3	IT Management
5.3	Software Project Management	4.2	Software Project Management
5.4	IT-Elective-II	5.4	IT-Elective-II
	5.4.1 Windows & database Programming (Delphi &PB)	5.4.2	SQL Server
	5.4.2 System Programming	5.4.1	Dot Net Programming
	5.4.3 Microsoft Foundation Classes	4.4.3	Programming in VC++
	5.4.4 Simulation Modeling	4.4.4	Multimedia Programming
	5.4.5 Network Programming	4.5.2	Network Security
5.5	BM- Elective-II	5.5	BM- Elective-II
	5.5.1 Knowledge Management	5.5.1	Knowledge Management
	5.5.2 Design & Implementation of E-Commerce Applications	5.1	E-Commerce Applications
	5.5.3 Business Process Engineering	4.5.4	Distributed Database System
	5.5.4. Recent Trends in IT	5.5.3	Cyber Law
5.6	Visual C++	4.4.3	Programming in VC++
5.7	Mini Project	5.7	Seminar

**Semester- VI****Old Syllabus****New Syllabus**

6.1 Software Project Development

6.1 Software Development Project

6.2 Comprehensive Exam.

6.3 Seminar &amp; Project Presentation