

University Of Pune

**Syllabus for Master Of Computer Applications
(M.C.A)**

MCA(Part I) From Academic Year 2005-2006

MCA(Part II) From Academic Year 2006-2007

MCA(Part III) From Academic Year 2007-2008

Introduction:

1. The name of the programmer shall be Master Of Computer Application (M.C.A) Integrated.
2. The knowledge and skills required to plan, design and build complex application Software systems are highly valued in all industry sectors including business, health, education and the arts. The basic objective of the education of the Masters programme in Computer Application (M.C.A) is to provide to the country a steady stream of the necessary knowledge, skills and foundation for acquiring a wide range of rewarding careers into the rapidly expanding world of the Information Technology.
3. The Job Opportunities are:
 1. Many graduates begin their careers as junior programmers and, after some experience, are promoted to programmers, system analysts, and programmer/analysts. Other seek entrepreneurial role in the computer world as independent business owners, software authors, consultants, or suppliers of systems and equipment. Career opportunities exist in such areas as management software and hardware sales, technical writing, training others on computer, consulting, software development and technical support.
 2. Application areas include transaction processing (such as order processing, airline reservations, banking system), accounting functions, sales analysis, games, forecasting and simulation, database management, decision support and data communications.
4. Specific elective courses to be offered in functional areas have to depend on student preferences, faculty availability and needs of the user systems in the region in which the educational institution is located
5. The M.C.A program is a mix of computer-related and general business courses. The computer related courses use microcomputers to introduce standard techniques of programming; the use of software packages including word processors, worksheets, spreadsheets and databases; system analysis and design. The general business courses include the functional areas of management like accounting, sales, purchase, inventory, and production. The course would emphasize the study and creation of business applications, rather than more

- programming. This would emphasize on domain knowledge of various area, which would help the students to build software applications on it. The students are exposed to system development in the information-processing environment, with special emphasis on Management Information Systems and Software Engineering for small and medium computer systems. Also, exposure to microcomputer technology, micro-based systems design and micro applications software, including network and graphical wear interface systems is provided.
6. The M.C.A. Integrated programme will be a full-time three years Master's Degree Course of Computer Applications.
 7. The new Curricula would focus on imparting skills, rather than knowledge to student. In other words, less theory, more practical.
 8. The inclusion of projects at three levels ensures the focus on applying the skill learnt at respective levels.
 9. The Institutes should organize placement programme for the M.C.A students, by interacting with the industries and software consultancy houses in and around the region in which the educational instruction is located.
 10. Ordinarily, in each class, not more than 60 students will be admitted.
- (II) (A) Eligibility for Admission:
1. A candidate who has either passed with minimum 45% of marks in the aggregate (40% in case of candidates domiciled in Maharashtra and belonging to the reserved categories i.e.S.C.,S.T.,D.T.,N.T.,O.B.C.,S.B.C.) or appeared at the final year examination of a post 10+2 course of minimum three years duration leading to an award of Bachelor's Degree, in any discipline by the Association of Indian Universities or has passed with minimum 45% of marks in the aggregate(45% in case of candidates domiciled in Maharashtra and belonging to the reserved categories)or appeared at an examination considered equivalent there to would be treated as eligible for Common Entrance Test(CET),Also the candidate must have passed I mathematics/Business Mathematics & Statistics paper for 10+2 or graduation Level **AND** Passed the CET conducted by Director of Technical Education MS with non zero score for that year. **OR** Passed the CET conducted by State level MCA Association with non zero score for that year. **Or** Passed the AIMCET exam for that year.
 2. However, a candidate would not be treated as eligible for admission to the MCA programme unless he/she passes his/her qualifying examination with requisite percentage on or before 30th September of the concerned academic year and also passes in the CET.
Generally, candidate passing all the papers that are generally covered over a period of minimum three year generally covered over a period of minimum three years in one sitting are not considered eligible. Likewise, candidates possessing

the qualifying degree although with requisite percentage of marks, whose duration is less than three years, are not considered eligible.

(B) Reservation of Seat:

The percentage of seat reserved for candidates belonging to backward classes only from Maharashtra State in all the Government Aided.Un-aided Instructions/Colleges and University Departments is as given below:

A)Scheduled castes and Scheduled castes convert to Buddhism	13.0%
B)Scheduled Tribes including these living outside specified areas	10.5%
C)Vimukta Jain(14 as specified)	
D)Normadic Tribes(NT1)(28 before 1990 as specified)	2.5%
E)Normadic Tribes(NT2)(Dhangar as specified)	2.5%
F)Normadic Tribes(NT3)(Vanjari as specified)	2.5%
G)Other Backward Class	19.0%
Total	50.0%

1. Candidate claiming to belong to categories mentioned against (e),(f) and (g) above in (B) will have to furnish certificate from appropriate authority that the candidate's parents do not belong to Creamy Layer as per the relevant orders of the Government.
2. If any of the (a) to (g) categories mentioned above does not get the required number of candidates for the percentage laid down in a University area, the seats so remaining vacant shall be filled in from among the candidates of remaining reserved categories with reference to the inter-se-merit of all candidates belonging to the reserved categories from the same University area. However, the total reservation shall not exceed 50%. After doing so the seats remaining vacant shall be filled in with reference to inter-se-merit of all the candidates from the same University area.

(C) Selection Basis:

The selection would be done as per the guidelines given by the Director of Technical Education Maharashtra State time to time.

(III) Number of Lectures and Practical:

Lectures and Practical should be conducted as per the scheme of lectures and practicals.

(IV) Practical Training and Project Work:

At the end of the sixth semester of study, a student will be explained in the course" Project Work".

1. Project work may be done individually or in groups in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to see the progress of individual modules is independent of others.
2. Students should take guidance from an internal guide and prepare a Project Report on "Project Work" in 2 copies to be submitted to the Director of the Institute by 30th April. Whenever possible, a separate file

containing source-code listings should also be submitted. Every student should also submit at least 4 typed copies of their project synopsis. Their respective Institutes should forward one copy of this synopsis to each of the external panel members, in advance of the project viva dates.

3. The Project Synopsis should contain an Introduction to Project, which should clearly explain the project scope in detail. Also, Data Dictionary, DFDs, ERDs, File designs and a list of output reports should be included.
4. The project Work should of such a nature that it could prove useful or be relevant from the commercial/management angle.
5. The project report will be duly accessed by the internal guide of the subject and marks will be communicated by the Director to the University along with the marks of the internal credit for theory and practical to be communicated for all other courses.
6. The project report should be prepared in a format prescribed by the University, which also specifies the contents and methods of presentation.
7. The major project work carry 200 marks for internal assessment and 300 marks for external viva. The external viva shall be conducted by a minimum of two external examiners. The mini project work would be departmental.
8. Project work can be carried out in the Institute or outside with prior permission of the Institute.
9. Project viva-voce by the University panel will be conducted in the month of April-May.

(V) Assessment:

The final total assessment of the candidate is made in terms of an internal assessment and an external assessment for each course.

1. For each paper, 30% marks will be based on internal assessment and 70% marks for semester and examination (external assessment), unless otherwise stated.
2. The division of the 30marks allotted to internal assessment of theory papers is on the basis of tutorial paper of 15 marks and seminars, presentations and attendance of 15 marks.
3. The marks of the mini project would be given on the basis of internal assessment of the project, project viva and project report.
4. The marks of the practicals would be given on internal practical exam & oral.
5. The internal marks will be communicated to the University at the end of each semester, but before the semester and examinations. These marks will be considered for the declaration of the results.

(VI) Examination:

Examinations shall be conducted at the end of the semester i.e. During November and in May, However supplementary examinations will also be held in November and May.

(VII) Standard of Passing:

1. Internal as well as external examination will be held in November and May. Every candidate, must secure 40% marks in internal as well as external Examination.
2. Reassessment of Internal Marks:
In case of those who have secured less than passing percentage of marks in internal i.e. less than 40% , the institute will administer a separate internal test.

The results of which may be conveyed to the University as the Revised Internal Marks.

In case the result of the internal test as above, results in lower marks than the original figure of the marks will prevail. In short, the rule is higher of the two figures of the marks.

However the institute will not administer any internal test, for any subject for those candidates who have already secured 40% or more marks in the internal examination.

(VIII) Backlog:

Candidates can keep terms for any semester of M.C.A., irrespective of the number of subjects in which he/she has failed in the previous MCA semester examinations.

(IX) Board of Paper Setters /Examiners:

For each Semester and examination there will be one board of Paper setters and examiners for every course. While appointing paper setter /examiners, care should be taken to see that there is at least one person specializing in each unit course.

(X) Class:

There shall be numerical marking for each question .At the time of declaration of the result, the marks obtained by a candidate is converted into classes as shown below:

Class	Total Marks
First Class with Distinction	2800 and above
First class	2400 to 2799
Higher Second Class	2200 to 2399
Second Class	2000 to 2199
Pass Class	1600 to 1999
Fail	1599 and below

(XI) Medium of Instruction:

The medium of Instruction will be English.

(XII) Clarification of Syllabus:

It may be necessary to clarify certain points regarding the course. The syllabus Committee should meet at least once in a year to study and clarify any difficulties from the Institutes.

(XIII)Revision of Syllabus:

As the computer technology is changing very fast, revision of the syllabus should be considered every 3 years.

(XIV)Teaching and Practical Scheme:

Minimum number of 1 and ½ hour sessions.

**Masters of Computer Application
Proposed Syllabus
For Academic Year 2005-2006**

Semester I

SrNo	Subject Code	Subject Title	Internal	External
1	IT11	Information Technology & Programming Methodologies	30	70
2	IT12	C Programming	30	70
3	IT13	Computer Architecture	30	70
4	*BM11	Cost and Financial Accounting	100	
5	BM12	Principles of Management Functions and Organizational behavior	30	70
6	MT11	Discrete Mathematics	30	70
7	IT11L	Front-end lab	50	
8	IT12L	C Programming Lab	50	

Semester II

SrNo	Subject Code	Subject Title	Internal	External
1	IT21	Data Structures and files using C	30	70
2	IT22	Operating System Concepts	30	70
3	IT23	Information Systems : Analysis and Design Methodologies	30	70
4	IT24	Database Management System	30	70
5	*BM21	Strategic Business Process	100	
6	MT21	Probability and Combinatorics	30	70
7	IT21L	Data Structure and Files Lab	50	
8	IT22L	DBMS Lab	50	

Semester III

SrNo	Subject Code	Subject Title	Internal	External
1	IT31	Web Supporting Technologies	30	70
2	IT32	Computer Networks	30	70
3	BM31	Management Support Systems	30	70
4	IT33	Object Oriented Programming Using C++	30	70
5	*MT31	Statistical & Numerical Methods	100	
6	IT34	Object Oriented Analysis and Design	30	70
7	IT31P	Mini Project based on Web Support Technologies	50	
8	IT31L	C++ Lab	50	

Semester IV

SrNo	Subject Code	Subject Title	Internal	External
1	IT41	Java Programming	30	70
2	*IT42	Application Development Technology	100	
3	BM41	Soft skills	50	50
4	IT43	Software Engineering	30	70
5	MT41	Optimization Techniques	30	70
6	BME1	Management Elective	30	70
7	IT41L	Java programming lab	50	
8	IT42L	Application Development Technology Lab	50	

Semester V

SrNo	Subject Code	Subject Title	Internal	External
1	IT51	Software Testing And Quality Assurance	30	70
2	IT52	Advanced Internet Technology	30	70
3	IT53	Emerging Trends in Information Technology	30	70
4	BM51	Software Project Management	30	70
5	*IT54P	Mini project	100	
6	ITE1	IT Elective	30	70
7	IT51L	Advanced internet technology Lab	50	
8	IT52L	CASE Tools Lab	50	

Semester VI

SrNo	Subject Code	Subject Title	Internal	External
1	IT61P	Project	200	300

List of IT Elective Subjects:

SrNo	Subject Title	Internal	External
1	Distributed Databases	30	70
2	Artificial Intelligence	30	70
3	Network Security	30	70
4	Mobile computing	30	70
5	Visual C++	30	70
6	Human Computer Interface	30	70
7	Parallel Computing	30	70
8	Advanced Unix	30	70
9	Programming Language paradigms	30	70

List of BM Elective Subjects:

SrNo	Subject Title	Internal	External
1	MIS Framework	30	70
2	Decision Support System	30	70
3	Information System Audit	30	70
4	Collaborative Management	30	70
5	Investment Technology	30	70
6	Foundations of decision Process	30	70

Rules of framing syllabus and Implementation:

1. Unitization of syllabus and allotment of marks accordingly.
2. Course material along with comprehensive worksheet should be prepared.

Note:

* Departmental Subject

* Each session is of 1 ½ Hrs.

Description	Numbers of Core subjects	Number of Elective subjects	Sessions/week/subject	Total sessions	Percentage
Information Technology	18	1	3	54	29.18
Business Management	5	1	3	15	8.1
Mathematical Techniques	4	-	3	12	6.4
Laboratory	10	-	5	50	27.02
Project	7	-	6	42	22.7
Seminar	3	-	3	9	4.86
Industrial Lecture	2	-	2	4	2.1
Total				185	100

IT 11:INFORMATION TECHNOLOGY & PROGRAMMING METHODOLOGY

SrNo	Chapter Details	Sessions	% Weightage of Marks	Reference Books
1.0	<p>Computer Basics</p> <p>1.1 Introduction: Computer Definition, uses, block diagram, functions of ALU, input/output scanner. plotter, keyboard, mouse, MICR, Bar decoder, OCR, joystick, monitor & generation with computer classification.</p> <p>1.2 History & generation</p> <p>1.3 Different storage devices (primary as well as secondary) Cache, virtual memory (concept) USB devices: Pen Drives/Flash Drives External/Internal Drives Modems</p>	8	11	1,6,7,9
2.0	<p>Data Representation:</p> <p>2.1 Need for Binary, Octal, Hex and their inter conversion.</p> <p>2.2 First & Second complement, Binary Arithmetic addition, subtraction, multiplication, division.</p> <p>2.3 Different Number Systems- BCD, EBCDIC, ASCII</p>	3	10	3,7,9
3.0	<p>Boolean Algebra:</p> <p>3.1 Demorgan's theorem, Duality theorem, Algebra rules, logic circuits, AND, OR, NAND, NOR, NOT, XOR, XNOR</p>	5	12	3,7,9
4.0	<p>Software</p> <p>System Software /Application Software Compilers, interpreter, assemblers. Linker, loader Programming language paradigm – high level, low level File-Types and representation of different file format eg. Tiff, gif, bmp, jpeg, pdf, etc.</p> <p>OS Concept, OS definition, Functions, Types such As NOS, SOS, and DOS.</p>	7	10	7
5.0	<p>Introduction to Viruses, Vaccines and firewalls</p>	2	6	4,5,7,9

SrNo	Chapter Details	Sessions	% Weightage of Marks	Reference Books
6.0	Programming methodology 6.1 Algorithms 6.2 Algorithm Definition Characteristics of an Algorithm Mathematical Background Counting Time, Asymptotic Notation Properties of Complexity O-notation, Ω - notation, θ - notation Properties of the Asymptotic Notations Time Complexity and Space Complexity 6.3 Flowchart	7	10	7
7.0	Introduction: Principles of language design(Syntax types, Type systems and semantics, Memory management and exception handling),Characters of Programming languages, Programming language Paradigms(Brief Introduction to imperative ,Object Oriented, Functional logic, Event Driven and Concurrent Programming.	4	10	1,6,7,9
8.0	Basic Building blocks of A Language Properties of structured and Non Structured data types, declaration, type checking, Binding and binding times ,type conversion scalar data type, composite data types, implementation of data types and Control Flow Statements	4	10	10,11

References :

1. Inside the PC by Peter Norton, John Goodman 8th edition
2. *Computers Today by Sanders
3. Digital electronics by R.P Jain
4. Operating systems by Donovan
5. Operating systems by Galvin
6. Computers Today by Basendra
7. Computer Fundamentals by P.K.Sinha
8. Computer Networking by Tanaunbaum
9. Fundamentals of computers by Rajaraman
10. Concepts of Programming languages-Sebesta.RW-Pearson Education 2001 4th Edition
11. Programming Languages Principles and Paradigms-Tucker A Nooran-TMH 2002 1st edition.

Note: Topic-wise list of books is given in the syllabus.

IT12 - C PROGRAMMING

Sr. No	Topic	(% Weightage of Marks	Sessions	Reference
1	1 An Overview of C 1.1. A Brief History of C 1.2. C is middle-level Language 1.3. C is a Structured Language 1.4. Compiler Vs Interpreters 1.5. The Form of a C Program. 1.6. Library & Linking. 1.7 Compilation & Execution of C. Program on Dos & Unix	4	2	1 , 2 , 3
2	2.Variables, Data Types, Operator & Expression 2.1. Character Set 2.2. C Token 2.3. Identifier & Keyword 2.4. Constant 2.4.1 Integer Constant 2.4.2 Floating Point Constant 2.4.3. Character Constant 2.4.4. String Literals 2.4.5. Enumeration Constant 2.5. Data Types in C 2.6. Data Declaration & Definition 2.7. Operator & Expression 2.7.1. Arithmetic Operator 2.7.2. Relational Operator 2.7.3. Logical Operator 2.7.4. Increment & Decrement Operator 2.7.5. Bitwise Operator 2.7.6. Assignment Operator 2.7.7. Conditional Operator 2.7.8. Precedence & Associativity of Operators.	8	3	1 , 2 , 3
3	3. Console I/O 3.1. Introduction 3.2. Character input & Output. 3.3. String Input & Output. 3.4. Formatted Input/Output (scanf/printf) 3.5. sprintf & sscanf	4	2	1 , 2 , 3

Sr. No	Topic	(%)Weig htage of Marks	Sessions	Reference
4	4.0 Control Statement 4.1. Introduction 4.2. Selection Statements 4.2.1. if 4.2.2. Nested if 4.2.3. The if-else-if 4.2.4. The ? alternative 4.2.5. The Conditional Expression 4.2.6. switch 4.2.7. Nested switch 4.3. Iteration Statements 4.3.1. The for loop 4.3.2. The while loop 4.3.3. The do-while loop 4.4. Jump Statements 4.4.1. The goto & label 4.4.2. The break & continue 4.4.3. The exit() function	10	4	1 , 2 , 3
5	5.0 Pointers 1.1. Introduction 1.2. Memory Organizatio 1.3. The basics of Pointer 1.4. The Pointer operator 1.5. Application of Pointer 5.6. Pointer Expression 5.6.1. Declaration of Pointer 5.6.2. Initializing Pointer 5.6.3. De-referencing Pointer 5.7. void Pointer 5.8. Pointer Arithmetic 5.9. Precedence of &, * operators 5.10.Pointer to Pointer 5.11. Constant Pointer	6	3	1 , 2 , 3

Sr. No	Topic	(%)Weig htage of Marks	Sessions	Reference
6	6.0 Array & String 6.1. Single Dimension Arrays 6.1.1. Accessing array elements 6.1.2. Initializing an array 6.2. Multidimension Arrays 6.2.1. Intializing the arrays 6.2.2. Memory Representation 6.2.3. Accessing array elements 6.3. Passing Single Dimension array to Function 6.4. Array & Pointer 6.5. Array of Pointer 6.6. String Manipulation Functions	10	5	1 , 2 , 3
7	7.0 Function 7.1. Introduction 7.2. Arguments & local variables 7.3. Returning Function Results 7.4. Call by reference & Call by value 7.5. Recursion	12	4	1 , 2 , 3
8	8.0 Storage Class & Scope 8.1. Meaning of Terms 8.2. Scope 8.2.1. Block scope & file scope 8.3. Storage Classes 8.3.1. Automatic Storage Class 8.3.2. Extern Storage Class 8.3.3. Static Storage Class 8.3.4. Register Storage Class	4	2	1 , 2 , 3
9	9.0 Structure ,Union, Enumeration & typedef 9.1. Structures 9.1.1. Declaration and Initializing Structure 9.1.2. Accessing Structure members 9.1.3. Structure Assignments 9.1.4. Arrays of Structure 9.1.5. Passing Structure to function 9.1.6. Structure Pointer 9.2. Unions	10	3	1 , 2 , 4

Sr. No	Topic	(%) Weightage of Marks	Sessions	Reference
10	10.0 C Preprocessor 10.1. Introduction 10.2. Preprocessor Directive 10.2.1. Macro Substitution Directive 10.2.2. File Inclusion directive 10.2.3. Conditional Compilation	6	1	1, 2, 3
11	11.0 File handling 11.1. Introduction 11.2. Defining & Opening a File 11.3. Closing a File 11.4. Input/Output Operations on Files 11.5. Error Handling During I/O Operation 11.6. Random Access To Files 11.7. Command Line Arguments.	12	3	1, 2, 3
12	12.0 Bitwise Operator 12.1. Introduction 12.2. Applications 12.2.1. Masking 12.2.2. Internal Representation of Date 12.3. Bit Fields	4	2	1, 2, 3
13	13.0 Graphics In C 13.1. Introduction 13.2. Drawing Object in C 13.2.1. Line 13.2.2. Circle 13.2.3. Rectangle 13.2.4. Ellipse 13.3. Changing Foreground & Background 13.4. Filling Object by Color	7	4	7
14	Command Line Arguments	3	1	

Reference:

1. C : The Complete Reference : Herbert Schildt
2. Let us C Solutions : Y.P. Kanetkar
3. Spirit Of "C" : Moolish Kooper.
4. Programming in C : S. Kochan.
5. C Programming Language : Kernighan & Ritchie.
6. Programming in C : R. Hutchison.
7. Graphics Under C : Y. Kanetkar

Paper Setters Guideline:

- 1) No Theory Questions
- 2) Programs will be asked
- 3) Output Questions can be asked

Note : Topic wise list of books is given.

IT 13 - COMPUTER ARCHITECTURE

Sr No	Chapter Details	Sessions	% Weightage of Marks	Reference Books
1.	Digital Logic Circuit 1.1.Logic gates 1.2.Combinational circuits 1.2.1. Half Adder 1.2.2. Full Adder 1.3. Flip Flop 1.3.1. SR 1.3.2. D 1.3.3. JK 1.3.4. Master – Slave 1.3.5. Edged Triggered 1.4. Decoder & Encoder 1.5. Multiplexer & DeMultiplexer (Only Basic Concept) 1.6. Shift Registers 1.7. Counters-All Types	6	6	3,8
2	Microprocessor 2.1 Components of Microprocessor 2.3. Real Mode & Protected Mode 2.4. Operation. 2.3. Processor Registers. 2.4 Addressing Modes & Op Code Concept 2.5. Interrupts 2.6. Microprocessor Control Signal, Address Data & Controls. 2.6.1 System Buses & Characteristics 2.7. Instruction & Execution Cycle	4	13	8,5,11
3	Interfaces 3.1. Interfaces Concept, I/O ports 3.2. Buses for Interfaces 3.2.1. ISA 3.2.2. EISA 3.2.3. PCI 3.2.4. MCA 3.2.5. VESA 3.2.6 USB	6	12	13,12,10

Sr No	Chapter Details	Sessions	% Weightage of Marks	Reference Books
4	Pipelining 4.1. Concept Of Parallel Processing 4.2 Pipelining Concept 4.3 Arithmetic & Instruction Pipeline 4.4 RISC pipelining	5	15	3,11
5	Processor Architecture 5.1. 16 Bit Architecture (80386/80286) 5.2 32 Bit Architecture (80486) 5.3 64 Bit Architecture (Pentium & Pentium Pro) 5.4 Floating Point Unit 5.5 Arithmetic Coprocessor Concept 5.6 Pentium Super Scalar Architecture (Itanium) 5.7 RISC & CISC	7	25	10,11,5,3,12
6	I/O Interfaces 6.1. Block Diagram of I/O Interface 6.2. Serial Communication Interfaces 6.2.1. Communication Controllers: Types, Concepts 6.3. Disk Controller 6.4. DMA Controller 6.5. Debouncing Concept 6.6. Analog Interfaces 6.6.1 A TO D Converter 6.6.2. D To A Converter 6.7. Handshaking 6.8. Transceivers	12	25	7,6,5,14,3,13,1
7	Computer System Performance 7.1. CPU Performance 7.2. Memory System Performance 7.3. I/O System Performance 7.4. SPEC Benchmarks 7.5. Transaction Processing Benchmarks	1	4	9

References:

- | | |
|---|--------------------------------|
| 1. Computer Organization & Architecture | Carpinell |
| 2. Ad. Computer Architecture | Dezso Siona |
| 3. Computer System Architecture | Morris Mano |
| 4. Ad. Computer Architecture | Kaithwang |
| 5. Microprocessor & Interfacing | Douglas Hall |
| 6. Digital Computer Electronics | Malvino |
| 7. Micro computer Systems | Yu Cheng Liu & Glann Gibson |
| 8. Digital Electronics | Bartee |
| 9. Introduction to Digital Computer Design | V. Rajaraman. & Radhakrishanan |
| 10. Computer Organization and Architecture | W. Stalling |
| 11. An Introduction To Intel Family Of Microprocessor | James Antonalcos |
| 12. Intel Micro Processors | Barry Brey |
| 13. Computer Organization & Design | Pal Chaudhary |
| 14. Microprocessor Architecture | Ramesh Gaonkar |

Note: Topic-wise list of books is given in the syllabus.

BM11- Cost and Financial Accounting :

SrNo	Chapter Details	Sessions	% Weightage of Marks	Reference Books
1	Financial Accounting 1.1 Double Entry Accounting system, Concepts and conventions in accounting, Accounting process, Depreciation	5	35	2,3,4
	1.2 Journalisation: Rules for Journalisation, posting in a ledger, subsidiary books, preparation of trial balance, Bank Reconciliation statement.	5		2,3,4
	1.3 Final Accounts: Preparation of Trading and profit and loss Account and Balance sheet of a proprietary and partnership firms.	6		2,3,4
2	Cost Accounting 2.1 Advantages of Cost Accounting, Comparison with financial accounting, Classification and elements of cost	5	30	1,2,3
	2.2 Methods of costing Techniques of costing: Marginal costing, Break-even chart, cost, volume profit analysis., Standard costing, Advantages, Variance analysis Budgetary Control –Types of budgets and Flexible Budget VS Fixed Budget ,Preparation of Simple cash budget & flexible budgets	6		1,2,3
	2.4 Cost Reduction and cost control, value analysis.	3		1,2,3
3	Management Accounting 3.1 Concept of Management Accounting, Objectives of Management Accounting, Comparison with financial and cost accounting	3	35	2,3,4
	3.2 Ratio Analysis: Objectives, Advantages and limitations, preparation of ratios from given information	4		2,3,4
	3.3 Funds flow analysis and cash flow analysis-understanding the concept	3		2,3,4

Instructions for Paper Setter: Problems may be set on following topics only.

- 1) Journal Entries ledger posting and preparation of trial balance
- 2) Preparation of final statements of proprietary firm
- 3) Cost sheet preparation
- 4) Marginal costing
- 5) Flexible budgets and cash budgets
- 6) Simple material and labour variances

Recommended books :

2. Cost and Management accounting-Satish Inamdar
3. Management Accounting-A.P. Rao
4. Management Accounting-Dr.Sanjay Patankar
5. Management Accounting-Khan and Jain
6. Management AccountingDr.Mahesh Kulkarni

Note: Topic-wise list of books is given in the syllabus.

MT11-DISCRETE MATHEMATICS

Sr no	Topic	% weightage of marks	Sessions	References
1	Mathematical logic Propositions (Statements) Logical connectivities, $N, A, V, \rightarrow, \rightarrow$ \leftarrow Compound statements from , truth tables, tautology , implications and equivalence of statements forms logical identities Normal forms : disjunctive normal form and simplification. Conjunctive normal form , logical implications , valid arguments ,methods of proof . Theory of inference of statement calculus, predicate calculus, qualifiers free and bound variables , theory of inference of predicate calculus.	30%	2 2 2 2 2	1,2,3,4
2	Relations and functions : Relation defined as ordered n-tuple Unary , binary , ternary , n-ary Restrict to binary relations Complement of a relation , converse relation , compositions , matrix representation and its properties Graphical representation of relation – Digraphs Properties of binary relation – reflexive , irreflexive , symmetric , asymmetric , transitive equivalence , equivalence classes , partitions covering , compatible relation maximal compatibility block , transitive closure – Warshall's algorithm. Partial ordering relation – Hasse diagram, Chains and antichains. Lattice , maximal and minimal elements , upper bound , lower bound , definitions Functions – definitions : Partial function , hashing functions , characteristic functions , floor functions , ceiling functions , subjective control , injenctive (one-to-one) Inverse functions, left reverse , right inverse	30%	1 1 1 1 1 2 1 1 1 1 1 1	

	Bijection and cardinality of finite set Infinite sets and compatibility Properties of countable sets Non-denumerable sets.		2 2	
3	Algebraic structures : Operations on sets -unary , binary , ternary definitions of algebraic systems (restrict to binary operations) Properties – closure , idempotent , associative , communicative , associative, commutative, identity , inverse Semigroup , subsemigroup Monoid , submonoid group , abelian group , permutation group,multiplicatibe abelian group , cyclic group Subgroups : Cosets , right cosets , left cosets , normal subgroups , quotient groups , isomorphism , homomorphism , automorphism Group codes : Weight and Hamming distance , minimum distance of code , generation of codes using parity checks – even parity , odd parity , parity check matrix – Hamming code, for detection and correction errors , formation of encoding function, decoding Application of residue –arithmetic to computers group codes	20%	1 1 1 1 1 2 1 1 1 1 1 1 1 2	
4	Graph theory : trees: Basic terminology , simple and weighted graph , adjacency and incidence , hand-shaking lemma , underlying graph of a digraph , complete gra[h , regular graph , bipartrite graph , complete bipartrite Isomorphism, complement of graph , connected graphs , paths-simple , elementary , circuit – simple , elementary Edge connectivity , vertex connectivity Eulesian path and eulesian circuit , planner graph – regions Euler’s formula Trees : Definition – leaf , root , branch node , internal node Rooted and binary trees , regular m-ary tree	20%	2 1 1 1 1 1 1 2	

Reference books :

1. Discrete Mathematical Structures for Computer S Science by Kolman B and Bushy R
2. Discrete Mathematical Structures with applications to Computer Science by Tremblay and Manohar
3. Discrete Mathematics by C L Liu
4. Discrete Mathematics by Rosen

**BM12 - PRINCIPLES OF MANAGEMENT AND ORGANIZATIONAL
BEHAVIOR**

S.No	Topics	Session	% Weightage of Marks	References
1	Management 1.1 The need, scope 1.2 Meaning and Definition 1.3 The process of Management 1.4 Managerial levels/Hierarchy 1.5 Managerial functions 1.5.1 Planning 1.5.2 Organizing 1.5.3 Staffing 1.5.4 Directing 1.5.5 Controlling 1.6 Managerial skills 1.6.1 Technical 1.6.2 Conceptual 1.6.3 Human Resource 1.7 Types of managers 1.7.1 Functional 1.7.2 Specialize 1.7.3 Generalise 1.8 Line and staff managers	4	20%	1,2,3,4
2	Evolution of Management Thought 2.1 Historical perspective 2.2 Classical Theories 2.2.1 Taylor 2.2.2 Fayol 2.3 Behavioral 2.3.1 HR Approach 2.3.2 Behavioral Science and Approach 2.4 Management Science Approach 2.5 System approach-with reference to management, organization and MIS Contingency approach	4	15%	1,2,3,4

S.No	Topics	Session	% Weightage of Marks	References
3	Managerial Decision Making 3.1 Introduction 3.2 Decision making environment 3.2.1 open Systems 3.2.2 Closed system 3.2.3 Decision making under certainty 3.2.4 Decision making under uncertainty 3.2.5 Decision making under risk 3.3 Decision Types /models 3.3.1 Structured decisions 3.3.2 Unstructured decisions 3.3.3 Programmable decisions 3.3.4 Non programmable decisions 3.3.5 Classical Model 3.3.6 Administrative model 3.4 Decision making tools 3.4.1 Autocratic 3.4.2 Participative 3.4.3 Consultative 3.5 Decision Making Tools 3.6 Herbert Simson's Model Principle of Rationality /Bounded Rationality	4	15%	1,2,3,4
4	Organisation 4.1 Introduction –definition 4.2 Need for Organisation 4.3 Process of Organising 4.4 Organisational structure 4.4 Functional organization 4.2.1 Product Organisation 4.2.2 Territorial Organisation	4	15%	5,6,7,8
5	Organisational Behavior 5.1 Definition / Concepts 5.2 Need /importance/ relevance 5.3 An overview	2	10%	5,6,7,8
6	Individual Behavior and Understanding Self 6.1 Ego State 6.2 Transactional Analysis 6.3 Johari Window	4	5%	5,6,7,8

S.No	Topics	Session	% Weightage of Marks	References
7	Group and Group Dynamics	4	20%	5,6,7,8
8	Team Building	4		
9	Leadership	3		
10	Conflict Management	3		
11	Theory X,Y and Z	2		

Important Note: The topics in Units 3,4,5 and 6 should be covered with the help of at-least one exercise each. All topics in Organisational Behavior should be covered with the help of role plays, case studies, simulation, games etc.

Books Recommended:

1. Principles and Practices of Management- Shejwalkar
2. Essential of management by Koontz H & Weitrich H
3. Management Today Principles And Practices by Burton & Thakur
4. Management Principles and Functions by Ivancevich & Gibson,Donnelly
5. Organisational behavior by Stepheb Robbins
6. Organisational behavior by Keith Davis
7. Organisational behavior by Fred Luthans
8. Organisational behavior by Dr.K.A.Ashwatthapa

Note: Topic-wise list of books is given in the syllabus.

IT 11L

Front-End Lab

Each session will be of 1 and 1/2 hours

Total number of Sessions – 40

Marks – 50

All the topics has to be covered with Lab Demos

S. No	Topic
1	Introduction
	<ul style="list-style-type: none"> Event driven programming, Concept of GUI. Various VB- Editions How to start with a project. Introduction of various windows like Properties, Project, Toolbox, Menubar
2	The language
	<ul style="list-style-type: none"> a. Variables <ul style="list-style-type: none"> Data Types, Types of variables Forcing variable declarations lifetime & scope, Converting variable types User defined data types b. Constants c. Arrays <ul style="list-style-type: none"> Declaring arrays, Multidimensional arrays d. Inputbox() & MsgBox() functions e. Control flow statements <ul style="list-style-type: none"> If...Then, If...Then...Else, Select f. Loop statements <ul style="list-style-type: none"> Do...Loop, For...Next, While...wend Nested control structures, exit statement g. Procedures <ul style="list-style-type: none"> Subroutines, Functions, With Arguments, With return values h. Built In Functions - Date, String, Mathematical
3.	Controls with main Properties, Methods & Events
	<ul style="list-style-type: none"> a. Label b. Textbox <ul style="list-style-type: none"> Basic properties , Text selection, Capturing key strokes c. Command box d. Option, Check box e. Combo, list box <ul style="list-style-type: none"> Indexing with a ListBox , Searching a sorted list f. Scroll bars & slider controls g. Timer h. Dir, File, Drive list boxes i. The remaining controls like shape, image, picture etc.

Sr No.	Topic
4	Designing the user interface
	Placing the controls on form. Aligning & grouping controls Setting focus, writing code with code design window Saving & running the application
5	Advanced ActiveX controls
	a. The common dialog controls Color, Font common dialog boxes The FileOpen & FileSave common dialog boxes The Print, Help common dialog boxes b. The Tree & List view controls How tree structure works Using the Tree view, List view control c. RichTextBox control d. MSFlex-grid control - Basic properties
6	The multiple document interface
	a. MDI Applications- the basic Built-in capabilities of MDI, Parent & Child menus b. Accessing Child forms Adding, loading, unloading forms c. Creating menus with Menu Editor, assigning the keys etc.
7	Database programming & Error Handling
	a. Understanding Databases & Database Management Systems Record sets, Accessing fields in database Data Control – Properties, Methods Advanced Data bound controls b. Using Visual Data Manager c. Database Connectivity with controls ADO Establishing connection Executing SQL stmts. Cursor types & locking mechanisms Manipulating Record set object. Simple record adding & editing Database Connectivity using code Grid controls- Flex grid, Data grid d. Handling errors
8.	Reports
	Data & Crystal reports , Simple reports with proper formatting, GroupWise reports
9.	Introduction of Creating DLL in VB.
10.	Making EXE File

Lab Exercises for VB

VB introduction

- a. Start a new project
- b. Open tools, properties & project explorer window
- c. Change the name of project
- d. Change name & title of form & save it.
- e. Set the following, save the form & run it.
 - i. Height & width
 - ii. BorderStyle property to FixedDialog
 - iii. WindowState property to maximized
 - iv. StartUpPosition property to center
 - v. Moveable property to false
 - vi. Font & foreground color

VB-The language

- a. Declare two variables. Accept the values using InputBox() & display the result on form.
- b. Accept 10 numbers in array, display minimum & maximum number.
- c. Display first odd numbers & store them in array.
- d. Accept numbers in array, take a number to search in an array, find the number of times that number is occurred in array.

Inputbox() & MsgBox() functions

- a. Accept a name from user & display hello in msgbox()
- b. Accept one number using inputbox() & display its factorial in msgbox()

Control flow statements & loops

- a. Accept a username & password using InputBox() check whether it is Scott & tiger resp., display valid user names else display proper error message.
- b. Accept a number, display whether it is odd or even number
- c. Accept a character, check whether it is a alphabet, number or special symbol.
- d. Accept a number, display its Armstrong no.
- e. Create a Fibonacci series for 10 numbers
- f. Accept a number check, whether it is prime or not.

Built in functions

- a. Display today's date with day, day name, month & year
- b. Accept a date from user, check whether the year is lap or not.
- c. Accept a date, check date validations.
- d. Display the date after 45 days from current date.

Procedures

- a. Write a procedure to display hello & welcome message when form loads
- b. Write a procedure to display Thank you message when form unloads
- c. Write a function mx(a,b,c) which will return maximum of 3 numbers.
- d. Write a function pyramid() which will accept a string & will display the string pyramid.
- e. Write a function rev(a) to reverse a number
- f. Write a function srev() to reverse a string.

VB basic controls with main properties, methods & events

- a. Add the label, change its name as lblmsg, On the form load event , display the message on label as Welcome
- b. Add a text box & a label in form, after selecting a text in textbox, display the selected text on label
- c. Add a text box& label on form, display the ASCII values of character typed in a textbox on a label.
- d. Accept a color name in text box. Display the forms background color as per the name of the color.
- e. Accept a message, encrypt it by key 2, display.
- f. Accept a String in text box, find out number of letters, numbers, special symbols in a string.

Command box

- a. Add a command box with Caption OK. When user clicks on it change to KO and vice-versa
- b. Display the command button with a File-save icon on it.
- c. Create a calculator, which will perform basic arithmetic operations like add, subtract, multiply, divide etc.

Option, Check box

- a. Develop a screen with 4 check boxes for hobbies & one button. After clicking on a button display the hobbies selected.
- b. Design an application, with 9 checkboxes from 0 to 9 & one button Add. After clicking on Add, display the sum of digits selected.
- c. Design a screen with 3 radio buttons for 3 different colors. If any one of them selected, change the background color as per the selected color.
- d. Accept two numbers from user. Using radio buttons display options like calculate Minimum, Maximum, average

Combo, list box

- a. Design an application with a text box & a Combo box, & some command buttons .
 1. On click of Add button, add text in text box to combo.
 2. On click of Delete button, the selected entry should get deleted from combo.
 3. on click of any above buttons display total number of final items in list.
- b. Design an application with a list box having names of Operating Systems.
 1. Allow user to select multiple entries
 2. On click of Display button show os selected.
 3. On click of delete, delete the selected names.
- c. Design an application with 2 list boxes, with buttons Transfer one, all after clicking on buttons transfer either selected items or all items to 2nd list box & vice versa.
- d. Design an application for formatting the Text entered in a text box. Add Combo for Font name & size. Add B, I, U command buttons. As per the font name, size & formatting options selected display the text. The buttons should be toggle. Once clicked effect should be enable or disable.

Scroll bars

- a. Add a horizontal scroll bar for a font size, with minimum 10 & maximum 72 points size. As per the scroll movement increase/decrease the size of text font by one.
- b. Create 3 scrollbars for colors Red, Green, Blue. The range of values be from 0 to 256. As per values of scrollbars change the color of label.
- c. Add one scroll bar. Display the current value of the scroll bar in text box.

Timer

- a. Design an application that will set timer interval as 10 And will display any one image of the 2 images.
- b. Using timer design a traffic signal application.
- c. Display a running clock in a text box.

Dir, File, Drive list boxes

- a. Design an application with directory; File & Drive list boxes, as per the drive-selected display the names of directories & subdirectories in list box. After selecting directory display all files within that directory.
- b. Display all files with extension .BMP.

Using all above controls designed applications for handling Employee data, Student Data, Books data.

Advanced Activex Controls

- a. Design an application with 2 buttons File – Open & File –Save. As per the button click display the Dialog boxes & name of the file selected.
- b. Write a Notepad application using RichTextBox Control.

MDI forms

- a. Create one MDI form, Add 3 child forms. Design a menu to arrange all the forms in Cascading, tile form.
- b. Design a menu of Edit with Cut, Copy, Paste, select all options. Assign shortcut keys & hot keys.
- c. Design an application for nested menus.

Database Programming

Using DAO

- a. Display all records of Emp table in text boxes.
- b. Create an application to Add, Delete, Modify employees (using code)
- c. Display all the records of employees working in deptno 20.
- d. Display all the records in Grid.
- e. Create an application using Visual Data Manager.

Using ADO

- a. Create an application, to scroll through the database records. use DSN with ADO control.
- b. Write the same application using code.
- c. Write an application for book entry,
 - i. That allows to enter new book details like book name, author, publication, edition, price etc., will generate bookid auto. Adds the records in db
 - ii. After selecting name of author display all the books with details having the same author.

iii. Display the book details as per the price range entered by user.

iv. Display all book details in MSFlex grid.

Create proper reports using Data/Crystal reports.

Note : All the assignments are mentioned using Visual Basic as the front end tool.

Institutes may use any other front end tool as per availability.

Semester II

IT12L - C Programming Lab

1. Find Area, Perimeter of Square & Rectangle.
2. Find max. Among 3 nos.
3. Check leap year
4. Factorial of Number
5. Calculate a^b
6. Prime Number.
7. Perfect Number.
8. Armstrong Number.
9. Floyd's Triangle
10. Fibonacci Series
11. Inter conversion of Decimal, Binary & Hexadecimal no.
12. LCM & GCD of numbers
13. Insert & Delete an element at given location in array.
14. Transpose of matrices
15. Multiplication of matrices
16. Display upper & lower diagonal of matrices
17. Array of Structure e.g. student result, Employee pay slip , Phone bill
18. Function with no parameter & no return values
19. Function with parameter & return values
20. Function with parameter & no return values
21. Function with call by reference
22. Recursion function e.g. sum of digit, reverse of digit
23. String manipulation function e.g. string copy, concatenation, compare, string length, reverse
24. Pointer Arithmetic
25. File handling e.g. Read / Write file, copy file, merging file
26. Random access of file
27. File handling with command line arguments
28. Drawing line, rectangle, circle, ellipse by using graph
29. Changing foreground/ background color
30. Changing color & font of text
31. Swapping of numbers by using bit wise operator.
32. Macro expansion
33. File Inclusion
34. IO interfacing & Device Driver using C.

IT21 - DATA STRUCTURE & FILES USING C

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
1	Introduction To Data Structure 1.1. Introduction 1.2. Data Definition 1.3. Data Object 1.4. Data Types 1.4.1. Built-in Data Type 1.4.2. Derived Data Type 1.5. Data Structure 1.6. Implementation of Data Structure 1.7. Analysis of Programs 1.8 Time Space Complexity	2	5	1,3,4
2	Array 2.1. Array as Data Structure 2.2. Storage Representation of Arrays 2.3. Applications of Arrays 2.4. Polynomial Representation Using Arrays 2.4.1. Addition of Two Polynomial 2.4.2. Multiplication of Two Polynomial 2.5. Sparse Matrices 2.5.1. Addition of Sparse Matrices 2.5.2. Transpose of a Sparse Matrix	3	10	1,3,4
3	Linked List 3.1. Introduction 3.2. Drawback of Sequential Storage 3.3. Concept of Linked List 3.4. Implementation of Linked List 3.5. Operation of Linked List 3.5.1. Creating a List 3.5.2. Displaying a List 3.5.3. Inserting an element in the List 3.5.4. Deleting an element 3.6. Other Operation & Applications 3.6.1. Reversing a Linked List 3.6.2. Concatenation of Two Lists 3.6.3. Representation of Polynomial 3.7. Circular Linked List & Operation 3.8. Doubly Linked List & Operation 3.9. Doubly Circular Linked List & Operation 3.10. Difference between an array and Linked list 3.11. Generalized Linked List 3.12. Header Linked List	4	12	1,3,4,5

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
4	Stack 4.1.Introduction 4.2.Definition 4.3.Operation on Stack 4.4.Static & Dynamic Implementation of a Stack 4.5.Application of Stack 4.5.1.Recursion 4.5.2.Infix, Prefix & Postfix expression 4.5.3.Matching Parentheses in an expression	4	10	1,3,4,5
5	Queue 5.1.Introduction 5.2.Definition of a Queue 5.3.Operation on a Queue 5.4.Static & Dynamic Implementation of Queue 5.5.Types of Queue 5.5.1.Circular Queue 5.5.2.Priority Queue 5.5.3. DEQueue 5.6. Application of Queue 5.6.1.Job Scheduling 5.6.2. Reversing Stack using Queue	2	10	1,3,4,5
6	Tree 6.1.Tree Terminology 6.2.Binary Tree 6.3.Binary Tree Representation 6.4. Binary Search Tree (BST) 6.4.1.Creating a BST 6.4.2.Binary Search Tree Traversal 6.4.2.1.Preorder Traversal 6.4.2.2. Inorder Traversal 6.4.2.3.Postorder Traversal 6.5. Expression Tree 6.6. Threaded Binary Tree 6.7. Height Balanced Tree (AVL Tree)	6	12	1,3,4,5
7	Graph 7.1. Introduction 7.2. Graph Representation 7.2.1. Adjacency Matrix 7.2.2. Adjacency List 7.3.Graph Traversals 7.3.1. Depth First Search 7.3.2. Breadth First Search 7.4. Applications of Graph 7.4.1. Shortest Path 7.4.2. Topological Sort	5	10	1,3,4,5

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
8	Sorting 8.1.Introduction 8.2.Types of Sorting Methods 8.2.1.Simple Exchange Sort 8.2.2.Bubble Sort 8.2.3.Quick Sort 8.2.4.Simple Insertion Sort 8.2.5.Shell Sort 8.2.6.Selection Sort 8.2.7.Heap Sort 8.2.8.Merge Sort 8.2.9.Radix Sort 8.3. Complexity Of Sorting algorithms	3	10	1,3,4,5
9	Searching 9.1.Introduction 9.2.Types of Searching Techniques 9.2.1.Sequential / Linear Search 9.2.2.Binary Search 9.2.3.Indexed Sequential Search 9.3.Hashing 9.3.1.Hashing Function 9.3.2.Overflow handling	3	10	1,3,4,5
10	Files 10.1.Defining a File 10.2. File Organization 10.3. Sequential File 10.3.1. Operation on Sequential File 10.3.2. Standard Functions: Add/Delete/Update Records 10.4.Direct Access File 10.4.1. Organization 10.4.2. Processing of Direct File 10.4.3. Operations 10.5. Index Sequential File 10.5.1. Design Choices in Index Files 10.5.2. Operations	4	10	3,4

Reference Books:

1. C & Data Structure : Balagurusamy
2. Data Structure through C : Y.P. Kanetkar
3. Data Structure, Files & Algorithms : Abhay Abhyankar
4. Data Structure & Files : G.P.Potdar.
5. Data Structure through C in depth : Shrivastava & Shrivastava
6. Data Structure : Seymour Liptsuz
7. Data Structure : Tannebaum

Note: Topic Wise list of books is given

IT22-OPERATING SYSTEMS CONCEPTS

Sr. No.	Chapter Details	Sessions	% Weightage Of Marks	Reference Books
1	Introduction 1.1Logical View 1.2User View System Calls 1.3Concept of Virtual Machine 1.4Interrupt Concept	2	2	5 , 2.
2	Process Management 2.1Process Concept 2.2Process Control Block 2.3Process Schedule algorithms 2.4Process operations 2.5Interprocess Communication 2.6Communication in Client-Server	8	10	2.
3	CPU Scheduling 3.1Scheduling Concept 3.2Scheduling Criteria 3.3Scheduling algorithms 3.4Scheduling Evaluation 3.5Simulation Concept	5	10	2.
4	Process Synchronization & Deadlock 4.1.Synchronisation concept 4.2.SynchronisationRequirement 4.3Critical Section Problem 4.4Monitors 4.5Deadlock concepts 4.6Deadlock prevention & avoidance 4.7Deadlock Detection 4.8Deadlock Recovery	7	15	2.
5	Memory Management 5.1Concept 5.2Memory Management Techniques 5.3Contiguous & Non Contiguous allocation 5.4Logical & Physical Memory 5.5Conversion of Logical to Physical address 5.6 Paging, Segmentation 5.7 Segment with paging 5.8 Virtual Memory Concept 5.9 Demand paging 5.9.1 Page Replacement algorithm 5.9.2Allocation of Frames 5.9.3Page fault	7	15	5, 2.

Sr. No.	Chapter Details	Sessions	% Weightage Of Marks	Reference Books
6	File management 6.1 File Structure 6.2 Protection 6.3 FILE system Implementation 6.4 Directory structure 6.5 Free Space Management 6.6 Allocation Methods 6.7 Efficiency & Performance 6.8 Recovery 6.9 NFS & NTFS 6.10SAMBAs Concept	6	8	1, 2 ,4.
7	Disk Management 7.1 Disk Structure 7.2 Disk Scheduling algorithm 7.3 Disk management 7.4 Swap Space concept and Management 7.5 RAID structure 7.6 Disk performance issues	4	10	2.
8	Distributed Operating System 8.1 Difference Between Distributed & Centralized OS 8.2 Advantages of Distributed OS 8.3 Types of Distributed OS 8.4 Concept of Global OS 8.5 NOS Architecture	8	10	1 , 2 ,3
9.	Features of different OS , Integration of OS,	2	Nil	Unleashed versions are useful manuals.

Reference Books :

1. Operating System : Achyut Godbole
2. Operating System : Galvin
3. System Programming & OS : D.M. Dhamdhare
4. Red Hat Bible Core Fedora Linux : Christopher Negus (Wiley Pub.)
5. Operating System : Andrew Tanenbaum

Note : 1. Internal marks (20) : should be based on Installation & Administration of Linux, WIN 2000/03.

Topic wise list of books is given.

IT23-INFORMATION SYSTEM ANALYSIS AND DESIGN METHODOLOGIES

Sr. No	Chapter Details	Sessions	% Weightage Marks	Reference Books
1.	<p>Overview of systems Analysis and design</p> <p>System concepts :</p> <p>1) Types of systems: Information System</p> <p>2) System Development Life cycle</p> <p>3) Role & Skills of system Analyst</p> <p>Models:</p> <p>a. Waterfall</p> <p>b. Prototyping</p> <p>c. Spiral (including WIN-WIN Spiral)</p> <p>d. RAD</p> <p>e. Group Based Approach: JAD</p> <p>f. Object Oriented methodology</p>	6	15	1,2,3, 6 7
2	<p>Investigation :</p> <p>1) Activities in Requirements Determination.</p> <p>a) Requirements Anticipation</p> <p>b) Requirements Investigation</p> <p>Fact finding methods</p> <p>c) Requirements Specifications</p>	3	10	1,7,2,6
3	<p>Evaluation :</p> <p>1) Feasibility Study : economical,operational, social,technical (with justification)</p> <p>2) Evaluating Proposed Solution</p> <p>3) Developing a System proposal</p> <p>4) Software Acquisition</p>	4	15	1,2
4	<p>Information requirement Analysis:</p> <p>1) Decision Analysis Tools: Decision Tree, Decision Table, Structured English</p> <p>2) Functional Decomposition Diagram</p> <p>3) Process modeling with physical and logical Data Flow Diagrams</p> <p>4) Entity Relationship Diagram : Identify Entity &Relationships</p> <p>4) Data Dictionary</p> <p>Case Studies on Decision analysis tools FDDs, DFDs should be covered</p>	12	20	1,7 6,4 8

Sr. No.	Chapter Details	Sessions	% Weightage Of Marks	Reference Books
5	Systems Design: Elements of Design 1) Design of input & Control, Objectives of Input Design Data Capture Guidelines Design of Source Document Input Validations 2) Design of output, Objectives of Output Design Types Of Output 3) Design of File Basic File Terminology Data Structure Diagrams Types of Files Methods of File Organizations 4) Design of Procedure 5) Design of program Specification Case studies should be covered on the topic	10	20	1, 5
6	User Interface design: Elements of good design , design issues , features of modern GUI , Menus , Scroll bars, windows , buttons, icons ,panels , error messages etc.	4	10	1,3
7	Control , Audit and Security systems : 1) Objectives and types of control , techniques 2) Need for Auditing of IS 3) Security of IS , types.	3	10	2,9

Note : ERDs will be covered in depth in DBMS in Sem II.

Books:

1. Analysis & Design of Information System – James Senn
2. Analysis & Design of Information System – V. Rajaraman
3. Software Engineering – Pressman
4. System Analysis & Design – Hawryszkiewicz
5. Software Engineering – Jawadkar
6. System Analysis & Design methods – Whiten, Bentley
7. System Analysis & Design – Elias Awad
8. DBMS Concepts – Korth
9. Reference book - Information system Control and Audit - Ron Weber

Note : Topic wise list of books is given

IT24 - DATABASE MANAGEMENT SYSTEM

Sr. No.	Chapter Details	Sessions	%Weightage Of Marks	Reference Books
1.0	Basic concepts 1.1 Database and Need for DBMS 1.2 Characteristics of DBMS 1.3 Database Users 1.4 3-tier architecture of DBMS (its advantages over 2-tier) 1.5 Data Models 1.6 Views of data-schemes and instances 1.7 Independence 1.8 Data modeling using the Entity-Relationship approach 1.8.1 Entities 1.8.2 Relationships 1.8.3 Representation of entities, attributes, relationship attributes, relationship set 1.8.5 Generalization , aggregation	8	10	1 ,2 ,3, 8
2.0	Conventional data models & systems 2.1. Hierarchical data model – IMS 2.1.1 Tree concept 2.1.2 Expressing M:N relation using HDM 2.1.3 Replication Vs Virtual records 2.2. Network Data model 2.2.1 Expressing relationships ; DBTG set 2.2.2 Expressing M:N relationships in DBTG 2.2.3 Cycles in DBTG 2.3. Relational model , languages 2.3.1 Structure of relational DB and diff. Types of keys 2.3.2 Expressing M:N relation 2.4. Relational data model and relational algebra	10	25	1, 2 ,4, 5, 8

Sr. No.	Chapter Details	Sessions	%Weightage Of Marks	Reference Books
	2.4.1 Codd's rules 2.4.2 Relational model concept 2.4.3 Relational model constraints 2.4.4 Relational Algebra - Case studies should be covered 2.5. Relational database language 2.5.1 Data definition in SQL 2.5.2 Views and queries in SQL 2.5.3 Specifying constraints and indexes in SQL 2.5.4 Specifying constraints management systems Oracle , Ingres			
3.0	Relational Database design 4.1 Functional dependencies, and Normalization Normal forms based on primary keys (1 NF ,2 NF ,3 NF ,BCNF, 4 NF,5 NF) Loss less joins and dependency preserving decomposition	5	20	4 ,5, 2
4.0	Transaction 5.1 Concept of transaction, ACID properties, serializability 5.2 Prioritization, states of transaction, 5.3 Concurrency control & recovery techniques 5.3.1 Locking techniques 5.3.2 Time stamp ordering 5.3.3 Granularity of data items 5.4 Recovery techniques 5.4.1 Recovery concept 5.4.2 Database backup & recovery from catastrophic failure	8	20	1, 2, 8
5.0	Concept of object oriented database management system	3	5	6 ,7
6.0	Security and privacy	2	5	2
7.0	Knowledgebase systems :Integration of expert in database application & object database overview	3	5	1 ,2, 8
8.0	Data mining and data warehousing – tools & architecture	3	10	1 ,2

Reference books :

1. Introduction to database systems by C.J.Date
2. Database system concept by Korth

3. Principles of Database Management by James Martin
4. Computer Database organization by James Martin
5. Relational database design for Micro computers Application by Prentice Hall (Jackson)
6. Object-oriented modeling and design by Rumbaugh and Blaha
7. Object-oriented analysis and design by Grady Booch
8. Database Management Systems by Bipin Desai

N B:

1. PL/SQL to be covered as lab sessions
2. Oracle Lab will be covered as Lab demo sessions.
3. Relational Calculus need not be covered in depth.

Note : Topic wise list of books is given

BM21-STRATEGIC BUSINESS PROCESSES

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
1	<p>Sales & Distribution</p> <p>1.1 Sales Budgeting-Market Segments/Customers/Products</p> <p>1.2 Customer Enquiry and preparation of Quotation</p> <p>1.3 Customer order processing-from Order Acknowledgement to Dispatch & Invoicing</p> <p>1.4 Pending Customer Order's follow up</p> <p>1.5 Sales Analysis</p> <p>While explaining this application consider an organization manufacturing multiple products with sales outlets spread across the country</p>	6	20	4
2	<p>Manufacturing</p> <p>2.1 Bill of materials processing with Product configuration</p> <p>2.2 Master Production Schedule</p> <p>2.3 Capacity Requirements Planning for equipment, Manpower and time</p> <p>2.4 Material Requirement Planning</p> <p>2.5 Production Planning-work order management</p> <p>2.6 Shop floor control Calculation of labour efficiency, productivity and equipment down-time analysis</p> <p>2.7 Material procurement-Indenting ,purchasing, Vendor analysis, supplier's Bill passing and receipt of material</p> <p>2.8 Stock accounting and control-Raw material, Work in progress and finished goods</p> <p>2.9 Job/product/WIP Costing-std/FIFO/LIFO/Avg/Wtd Avg Costing methods</p> <p>2.10 Sub-Contracting of work to outside vendors</p>	6	20	1 4

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
3	Human Resource 3.1 Employee Database 3.2 Recruitment 3.3 Employee Appraisal 3.4 Employee Training 3.5 Leave accounting 3.6 Payroll Salary calculation and reporting Income Tax calculation and reporting Loan Accounting PF and gratuity Bonus, Ex-gratia, Incentive, Superannuation Arrears Calculation	8	20	2
4	Banking: Saving Bank Accounting – Real time, Internet banking, Fixed deposits Hospital management :Patient's registration-online, service of Lab and operation theatre, inventory and consumables, billing and credit control, patient's medical history database	4	20	4
5	Advanced Business Systems 5.1 Enterprise Resource Planning a Evolution, Scope b. What is ERP ? Why ERP? c. Package ERP solution Vs Custom development d. Features of ER, different modules of ERP, How ERP works? e. Pre-requisites for implementing ERP- BPR/BPM f. ERP Implementation-Issues methodologies, etc g. Selection of ERP Software 5.2 Supply chain Management(SCM) a. Demand forecasting and Planning b. Distribution inventory planning and plant capacity, planning and scheduling c. Integration with ERP d. Technologies used such as EDI, Web, etc.	12	20	3 4

Sr. No.	Chapter Details	Session	% Weightage Of Marks	Reference Books
	5.3 Customer Relationship Management (CRM) <ul style="list-style-type: none"> a. CRM covers marketing, Sales and service functions of a company b. CRM Process- customer Acquisition/Development/ c. Retention d. Technologies used-Business Intelligence-Data Warehousing/Data Mining/Data Mining DSS e. Call center 			

References :

1. Production and Operation Management by Mayer
2. Personnel Management by C B Mammoria
3. Enterprise Resource Planning and Business Process by M M Sahikh
4. Business Applications by Dr Milind Oka

Note: Topic wise list of books is given

MT21-PROBABILITY & COMBINATORICS

Sr.No	Chapter Details	Sessions	% Weightage Of Marks	Reference Books
1	Permutations & Combinations Addition principle, multiplication principle, Bijection principle, r-permutations of n-elements, r-combination of n-elements, binomial coefficients, circular permutations, permutations with repetitions, Multinomial theorem, combinations with repetitions, Distribution of objects- 1. Distinct objects in distinct cells 2. Indistinguishable objects in distinct cells 3. Distinct objects in, indistinguishable cells 4. Indistinguishable objects in distinguishable cells	10	15	1,2
2	Number of non-negative integer solutions of linear equations with conditions Binomial identities	4	10	1,2
3	Principle of Inclusion & Exclusion Formula Derangement- restrictions on relative positions Generating functions for discrete numeric functions, for combinations	4	10	1,2
4	Recurrence Relations-Linear Homogeneous, nonhomogeneous, Pigeonhole principle	5	10	1,2
5	Probability Sample space, events, different approaches, conditional probability, Baye's rule, Random variables, univariate & biovariate Discrete Distributions Binomial, Poisson, Negative Binomial, Geometric, hyper geometric, zeta distributions Continuous Distributions Uniform, normal, Elanggamma, exponential, Ray Leigh laplace, cauchy,	15	25	1,2

Sr.No	Chapter Details	Sessions	% Weightage Of Marks	Reference Books
	marginal & conditional distributions For the above discrete distribution definition of r.v and derivation of its p.m.f. is expected. For the continuous distributions p.d.f. should be defined			
6	Special properties of the distribution (if any) should be tested	2	5	1,2,3
7	Expectation Expectation of R.V, expectation of a function of a r.v. should be defined For all the above distributions using these definitions mean & variance should be obtained.	5	15	
8	Moment generating function & its properties. Finding mean & variance using m.g.f. cumulant generating function, cumulants properties, finding mean & variance using cumulants, characteristic function-properties, finding mean & variance	5	10	

Books –

For Probability

1. A first course in Probability by Ross S.
2. Probability & Random Process T.Veerarajan

For Combinatorics

3 Discrete Mathematics by Modak Andor Boxwala
(BSC computer) Munot

4 Combinations by Modak Andor Boxwala

5 Discrete Mathematics by C.L. Liu

Note: Topic wise list of books is given

IT21L-Data Structure &Files Using C Lab

1. Addition and Multiplication of Two Polynomials.
2. Addition and Transpose of Sparse Matrices.
3. Singly Linked List: Create, Display, Insertion, Deletion, Search, Reverse
4. Singly Circular Linked List: Create, Display, Insertion, Deletion, Search,
5. Doubly Linked List: Create, Display, Insertion, Deletion, Search, Reverse
6. Stack Implementation
7. Stack Application: Inter conversion of Infix, Prefix & Postfix
8. Stack Application: Palindrome & Matching Parenthesis.
9. Queue Implementation
10. Queue Application: Job Scheduling.
11. Binary Search Tree Implementation: Creation, Insertion, Deletion, Copy, Mirror, Traversal (Preorder, Post order, In order).
12. Graph Application: Depth First Search, Breadth First Search, And Shortest Path Algorithm.
13. Searching: Sequential, Binary, Index Sequential
14. Sorting: Selection, Bubble, Insertion, Quick, Merge. Comparison of all sorting techniques
15. Hashing: Linear Probing, Chaining
16. Files: Sequential: Add/Delete/Update/Search Record.
17. Files: Direct Access: Add/Delete/Update/Search Record.
18. Files: Index Sequential: Add/Delete/Update/Search Record.

IT22L-DBMS LAB

Sr.No.	Chapter Details
1	Overview of RDBMS, Oracle introduction
2	Introduction of SQL DDL, DML, DTL Basic Data Types Char, varchar/varchar2, long, number, Fixed & floating point Date, CLOB, BLOB
3	Table Constraint definition Commands to create table
4	Commands for table handling Alter table , Drop table , Insert records
5	Commands for record handling Update, Delete Select with operators like arithmetic, comparison, logical Query Expression operators Ordering the records with orderby Grouping the records
6	SQL functions Date, Numeric, Character, conversion Group functions Avg, max, min, sum, count
7	Set operations Union, Union all, intersect, minus
8	Join concept Simple, equi, non equi, self, outer join
9	Query & sub queries
10	Synonym introduction, object type Create, synonym as alias for table & view, drop
11	Sequence Introduction, alter sequence, drop
12	View Intro, create, update, drop
13	Index Introduction, create
14	Primary introduction to DBA User create, granting previlieges (Grant, Revoke, Commit, Rollback, Savepoint)
15	Report writer using SQL Title, Btitle, skip, pause, column, SQL, Break on, computer sum

Sr.No.	Topic
16	Introduction of PL/SQL Advantages of PL/SQL Support of SQL Executing PL/SQL
17	PL/SQL character set & Data Types Character, row, rowed, Boolean, binary_integer, number Variable, constant
18	PL/SQL blocks Attribute % type, %rowtype, operators, function comparison numeric, character, date Control structure Condition – if Interactive- loop, for, while Sequential – goto
19	Composite data types Record- declaration, refer, record assignment Table- Declaration, table attributes (Count, delete, exists, first, last, next, prior)
20	Database Triggers Definition, syntax, parts of triggers Types of triggers, enabling & disabling triggers
21	Sub programs Definition Features Cursors
22	Procedures Definition, creating, Parameter
23	Function Definition & implementation
	Total sessions : 40

Recommended Books

1. Understanding ORACLE by Perry J. & Later J.
2. Understanding SQL by Martin Gruber, BPB publication
3. SQL by Scott Urman
4. ORACLE PL/SQL Programming by Scott Urman
5. SQL, PL/SQL the programming language of Oracle by Ivan Bayross

Lab Exercises

Exercise 1

1. a. Create table Salespeople with fields snum, sname, city, commission
- b. Orders table with fields onum, odate, snum, amt
- c. Customers table with fields cnum, cname, city, rating, snum

Exercise 2

1. Add at least 10 records
2. Display all the records with all sales peoples information.
3. Display the details of fields sname, commission
4. Display the odate, snum, onum, amt from orders table.
5. Display snum from orders table without duplications.
6. Display name & city of salesman where city is "Pune"
7. Display all details of customer where rating is 100.
8. Display all details from customer table where salespersons number is 1001.
9. Display the numbers of sales persons, with orders currently in the orders table without any repeats.
10. Display all customers where rating is more than 200
11. Display all customers where city is 'Mumbai' rating is more than 100.
12. Display all customers where city is either 'Pune' or 'Mumbai'
13. List all customers not having city 'Pune' or rating more than 100
14. List all orders between order dates 10/03/05 to 30/3/05
15. Display all orders more that 1000 amt.
16. Display names & cities of all salespeople in 'Pune' with a commission above 10.
17. Display all customers excluding those, with rating less than equal to 100, unless they are located in 'Nagar'
18. Display all sales persons names starting with character 'G'
19. Display all sales persons names starting with character 'G', the 4th character is 'A' & the rest of characters will be any.
20. Find all records from customers table where city is not known i.e. NULL.
21. Display all the customers names begins with a letter A to G.
22. Assume each salesperson has a 12% commission on order amt. Display orderno, snum, commission for that order.

Exercise 3

1. Display all the customers records, arranged on name.
2. Display all customers records arranged on rating in desc. Order.
3. Display all sales persons records arranged on snum
4. Display the count for total number of customers in customers table.
5. Display the count of snum in order table without duplication of snum.
6. Display the counts of all orders for Feb05
7. Display the count of different non-NULL city values in the customers table.
8. Display the maximum outstanding amount as blnc+amt
9. Display the minimum rating within customers table.
10. Display average of amt.
11. Display sales persons number wise maximum amt from order table.

12. Display the largest order taken by each salesperson on each date.
13. Display the details of maximum orders above 3000.
14. Display details of orders order number & date wise
15. Display customers highest ratings in each city.
16. Write a query that totals the orders for each day & places the results in descending order.

Exercise 4

1. Add a column blnc in orders table for current balance
2. Increase commission of all sales persons by 200.
3. Delete all orders where odate is less than 5-2-05

Exercise 5

1. Display names of all customers matched with the salespeople serving them.
2. Find all orders by customers not located in same cities as their salespersons.
3. Display each order number followed by the name of customer who made it.
4. Calculate the amount of salespersons commissions on each order by a customer with a rating above 100.
5. Display the pairs of salespeople who are living in the same city. Exclude combinations of sales people with themselves as well as duplicate rows with the order reversed.
6. Display the names & cities of all customers with same rating as Hoffman.

Exercise 6

1. Write a query that uses a subquery to obtain all orders for the customer named 'Gopal'. Assume you do not know the customer number.
2. write a query that produces the names & ratings of all customers who have above-average orders.
3. Write a query that selects the total amt in orders for each salesperson for whom this total is greater than the amount of the largest order in table.

Exercise 7

1. Create a union of two queries that shows the names, cities & ratings of all customers. Those with a rating of 200 or greater will also have ratings "high rating", while the others will have the words "low rating".
2. Write a command that produces the name & number of each salesperson & each customer with more than one current order. Put results in alphabetical order.

Exercise 8

1. Create an index that would permit each salesperson to retrieve his or her orders grouped by date quickly.
2. Create a view that shows all of the customers who have highest ratings.
3. Create a view that shows number of salespeople in each city.

Exercise 9

1. Write a PL/SQL block of code that first inserts a record in an 'emp' table. Update the salary by Rs. 2000. then check to see that the total salary does not exceed 20000. if so, undo the updates made to the salaries.

2. HRD manager has decided to raise the salary of employees by 0.15. Write a PL/SQL block to accept the employee number & update the salary of that emp. Display message based on the existence of record in employee table.
3. when any such raise in salary, a record for the same is maintained in emp_raise table. It includes the employee no, the date of raise & the actual raise.
4. Create a stored function to perform itemid check operation. Which accepts a itemid & returns a flag as per the id exist or not.
5. Application using database triggers –
Create a transparent audit system for a table Client_master. The system must keep track of the records that are being deleted or updated. When the record is deleted or modified the original record details & date of operation are stored in audit table & then the delete & update is allowed to go.

Semester III**IT-31 : WEB SUPPORT TECHNOLOGIES****Course Objectives:**

This course enables students to understand web page site planning, management and maintenance. The course explains the concepts of developing advanced HTML pages with the help of frames, scripting languages, and evolving technologies like DHTML, and XML

Sr No	Chapter details	Marks %	Sessions	References
1	HTML & Forms Introduction to HTML, WWW & w3c Web Publishing, process & phases Common HTML, Tags Physical & Logical HTML Linking your documents Images and Links Image Mapping Lists, Tables and Frames Developing Layouts Form Development and Form Element	15	08	1, 3
2	CSS Introduction to Style sheet, Types of Style Sheet- Inline, External & Embedded Style sheet Properties	12	04	1,3
3	Java Script Client & Server side Scripting Introduction to Java Script identifiers & Operators Control Structures and Looping User defined and predefined functions Document Object Model (DOM) DOM Objects, Window Navigator, History, Location, Core Language Objects – String, Date, Math, Boolean Event Handling in Java Script Form Objects and Validation on Forms	18	10	2,3
4	VB Script Introduction to VB Script Variables and Data Types Control Structures & Looping Error handling and debugging Syntax Errors Logical Errors Error Object Client Side Web Scripting Validating Forms, DOM	10	04	04

Sr No .	Chapter details	Marks %	Sessions	References
5	Front Page (For Practicals Only) Introduction to Front Page Working with Explorer Working with Editor Working with Images, Tables, Frames & Styles, Front page Components		02	
6	XML Introduction to XML Features of XML XML & CSS Using XML, DSO DTD & Schemes, XML Namespaces Writing simple sheet using XSLT SAX & DOM Parsers, Introduction to SOAP, Introduction to simple access database and XML programs	15	12	5,6,7

Reference :

- 1.Complete Reference HTML – Mr. Thomas A. Powell by Tata Megraw Hill Publication
2. Java Script Bible
3. HTML, DHTML, Java Script, Perl & CGI by Ivan Bayross
4. VB Script Programmer' s reference by Wrox Press
5. Internet Technology at Work-Hofstetter fred.
6. Beginning XML by Wrox Press
7. XML how to program by Deitel & Deitel

Note : Any editor like front page or Visual Interdev will be taught to the students in two sessions. It will be taught for practical purpose only and will not be considered for the exams.

IT32 – COMPUTER NETWORKS

Sr. No	Chapter Details	Session	Marks %	References
1	Introduction to Networking: Hardware Architecture:- Topologies, Media, Devices Transmission Techniques:- Twisted Pair, Coaxial Cable, Fiber Optics, Wireless Transmission Switching: - Circuit Switching, Message Switching, Packet Switching	2		2
2	Common Network Architecture: Connection oriented N/Ws, Connectionless N/Ws, Some Example of N/Ws :- P2P, X,25, ATM, Ethernet, Wireless LANs : 802.11, 802.11x, Gigabit	5		1
3	The OSI Reference Model: Protocol Layering, TCP/IP Model, OSI vs TCP/IP	2		2
4	Local Area Networks: Components & Technology Access Technique Transmission Protocol & Media	2		5
5	Broad Band Networks Integrated Service Digital Networks (ISDN), Broad Band ISDN, ATM, ATM Traffic Management, Introduction to very small Aperture, Terminal(VSAT)	2		4
6	IP Addressing & Routing: IP addresses – Network part and Host Part Network Masks, Network addresses and Broadcast addresses, Address Classes, Loop back address, IP routing concepts Routing Tables, Stream & Packets What IP does? , What TCP does?, Sliding Windows, TCP – a reliable pipe, TCP connection – Multiple conversations, Port Numbers, Multiple Connection from many hosts and one host IPV6 : The next generation Protocol	8		5

7	Domain Network Services (DNS) Domain Names, Authoritative Hosts, Delegating Authority, Resource Records, SOA records, DNS protocol, DHCP & Scope Resolution	4		5
8	Network Applications (HTTP, Email, etc) Hyper Text Transfer Protocol (HTTP) HTTP communications: - HTTP request, Request Headers, Responses, Status Code, Error Status Code Email : Sending & Receiving Emails, Email Addressing, Message Structure MIME – Multipurpose Internet Mail Extensions SMTP – Simple Mail Transfer Protocol with Examples Mail Exchangers – Delivering a message, Mail Boxes POP – Post Office Protocol IMAP – Internet Message Access Protocol FTP – File Transfer Protocol Telnet – Remote Communication Protocol Proxy Server, Proxy Web Servers	10		5
9	SNMP : An IP Management Protocol Network Management protocols SNMP the Simple Network Management Protocol, Agents & Managers SNMP organization Object Identifiers Problem with SNMP	2		3
10	Network Security : Threats, Packet-filtering firewalls, Fire wall policies and rules, Common Problem with Packet Filtering, SSL – Secure Socket Layer, IPSec(Internet Protocol Security), Virtual Private Networks, Symmetric Key Signatures, Public key Signatures, The Birthday Attack	5		6

Reference:

1. Computer Networks , Abndrew S. Tanenbaum 4e
2. Network Essential Notes , GSW MCSE Study Notes
3. Internetworking Technology Handbook , CISCO System
4. Introduction to Networking and Data Communications, Eugene Blanchard
5. Computer Networks and Internets with Internet Applications, Douglas E. Comer
6. Firewalls and Internet Security, William R. Cheswick

BM 31 : MANAGEMENT SUPPORT SYSTEMS

Sr. No	Chapter details	Sessions	Marks %	References
1.	System Concept 1.1 General Model 1.2 Types of systems 1.3 Subsystems 1.4 Organisational structure and functions 1.5 Systems approach to organization 1.6 Dynamics to Decision Making, 1.7 Control by exception 1.8 Feedback control 1.9 Law of requisite variety 1.10 Cases related to Feedback Control.	5	15	1,4
2.	Information Concepts 2.1 Definition 2.2 Types of Information 2.3 Quality of information 2.4 Value of information, 2.5 Information needs of managers at different levels 2.6 Cases related to Information	5	10	3,2
3	Management Information Systems 3.1 Definitions 3.2 Integrated system 3.3 MIS Vs Data processing 3.4 MIS and other academic disciplines 3.5 Structure of MIS based on management activity and functions 3.6 Systems concepts to MIS	6	10	3,2
4	Humans As Information Processors 4.1 Newell-Simon model 4.2 Limits on Human Information Processing 4.3 Characteristics of Human Information Processing performance	5	10	3,2
5	Information Systems for Functional Areas 5.1 Information for financial 5.2 Marketing 5.3 Inventory control 5.4 Production function 5.5 Personnel function Cases related to information requirement for above functional areas.	8	15	2

6	Decision Making Systems and Modeling 6.1 Modeling process 6.2 Information needed for different phases & decision making 6.3 Sensitivity analysis 6.4 Static and dynamic models 6.5 Simulation 6.6 Operations Research Techniques 6.7 Heuristic programming 6.8 Case studies	4	10	1,3
7	Management support systems-Overview 7.1 Decision making phases 7.2 Concept of decision making 7.3 Decision Support Systems 7.4 Differences between MIS and DSS	4	10	3,1
8	Executive Information and Support Systems 8.1 Needs 8.2 Characteristics 8.3 Software and Hardware 8.4 Integrated EIS and DSS 8.5 EIS implementation	3	10	3,1
9	Expert Systems 9.1 Basic concepts of Expert Systems 9.2 Comparison of conventional & Expert Systems 9.3 Structure of Expert Systems.	2	10	3,1

References :

1. Management Information System By Gordan Devis, Margrethe H. Oison.
2. Information Systems for Modern Management (Ch. 6) By Robert Murdick, Joel e. Ross.
3. Decision Support & Expert System (Ch. 1, 2, 3, 4, 8, 10) By Efraim Turban.
4. MIS By Javadekar

IT33-OBJECT ORIENTED PROGRAMMING USING C++

Course Objectives : By the end of the course students will be able to:

- Write C++ programs using the more esoteric language features.
- Utilise OO techniques to design C++ programs.
- Use the standard C++ library.
- Exploit advanced C++ techniques

Sr. No	Chapter details	Sessions	Marks %	References
1.	Principle of OOP's	2	2	3
	Introduction Procedural Vs Object Oriented Programming Classes Object Data Abstraction Encapsulation Inheritance Polymorphism Dynamic Binding Message Passing Object Oriented Languages Object Based languages			
2.	Basics of C++	1	2	1,3
	A Brief History of C & C++ C Vs C++ A Simple C++ Program Application of C++ Structure & Class Compiling & Linking			
3.	Expression	2	4	1,3
	Tokens, Keywords Identifiers & Constants , Basic Data Types, User-Defined Data Types Symbolic Constant Type Compatibility Reference Variables Operator in C++ Scope Resolution Operator Member Dereferencing Operators Memory Management Operators Manipulators Type Cast Operator			

4.	Functions In C++	2	6	1,2,3
	The Main Function, Function Prototyping Call by Referencem Call by Address, Call by Value, Return by Reference Inline Function, Default Arguments Const Arguments,Function Overloading Friend Function			
5.	Classes & Object	4	12	1,3
	A Sample C++ Program with class Defining Member Functions Making an Outside Function Inline Nesting of Member Functions Private Member Functions Arrays within a Class Memory Allocation for Objects Static Data Members, Static Member Functions, Arrays of Objects Object as Function Arguments Friendly Functions, Returning Objects, Const member functions Pointer to Members, Local Classes			
6.	Constructor & Destructor	2	6	1,3
	Constructor Parameterized Constructor Multiple Constructor in a Class Constructors with Default Arguments Dynamic Initialization of Objects Copy Constructor Dynamic Constructor Const Object Destructor			
7.	Operator Overloading & Type Conversion	3	6	
	Defining operator Overloading Overloading Unary Operator Overloading Binary Operator Overloading Binary Operator Using Friends Manipulating of String Using Operators Type Conversion Rules for Overloading Operators			
8.	Inheritance	3	10	1,3
	Defining Derived Classes Single Inheritance Making a Private Member Inheritable Multilevel Inheritance Hierarchical Inheritance			

	Multiple Inheritance, Hybrid Inheritance Virtual Base Classes, Abstract Classes Constructor in Derived Classes Nesting of Classes			
9.	Pointer, Virtual Function & Polymorphism	3	10	1,3
	Introduction Pointer to Object, This pointer Pointer to Derived Class, Virtual Function Pure Virtual Function, Early Vs Late Binding			
10.	The C++ I/O System Basics	2	6	1,3
	C++ Streams, C++ Stream Classes Unformatted I/O Operation Formatted I/O Operation Managing Output with Manipulators			
11.	Working with Files	3	10	1,3
	Introduction Classes for File Stream Operation Opening & Closing Files Detection of End of File More about Open(): File modes File pointer & manipulator Sequential Input & output Operation Updating a File : Random Access Command Line Arguments			
12.	Template	2	6	1,3
	Generic Function A function with Two Generic Data Types Explicitly Overloading a Generic Function Overloading a Function Template Using Standard Parameter with Template Functions Generic Function Restriction Applying Generic Function : Generic Sort Generic Classes An Example with Two Generic Data Types Using Non-Type Arguments with Generic Class, Using Default Arguments With Template Classes, Explicit Class Specification, The typename & export keywords			
13.	Exception handling	2	5	1,3
	Exception Handling Fundamentals The try Block, the catch Exception Handler The throw Statements			

	The try/throw/catch sequence Exception Specification Unexpected Exception Catch – All Exception Handlers Throwing an exception from handler Uncaught Exception			
14.	Introduction to Standard Template Library	2	5	1,6,3
	STL Programming Model, Sequence Container Adapter, Integrator Algorithms, Predicates, Allocators			
15.	Namespace	2	5	1,6,3
	Introducing Namespaces Referring to Members of a Namespace The using namespace Statement Defining A Namespaces Nested Namespaces Unnamed Namespaces Namespace Aliases			
16.	New Style Casts & RTTI	2	5	1,6,3
	New-Style Casts, dynamic_cast static_cast ,reinterpret_cast const_cast, Runtime Type Information (RTTI), A Simple Application of Run-Time Type ID, Ttypeid Can be Applied to Template Classes			

Reference :

- 1.C++ : The Complete Reference by Herbert Schildt
- 2.Let us C++ By Kanetkar
- 3.Object Oriented Programming with C++ : E. Balagurusamy
- 4.C++ Primer : Stanley Lippman & Lajoi
- 5.C++ Programming Language : Bjarne Stroustrup
- 6.C++ Programming Bible : Al Stevens & Clayton Walnum

MT31-STATISTICAL AND NUMERICAL METHODS

Sr no	Chapter details	Sessions	Marks %	References
1	Section I : Statistics Measure of central tendency and dispersion	8	20	1,2,3,6,7,8
2	Correlation and regression , multiple and partial correlation and regression	4	5	1,2,3,6,7,8
3	Probability : binomial , distribution , Poisson distribution , normal distribution	4	5	1,2,3,6,7,8
4	Time series : Meaning and utility, components of time series, additive and multiplicative models, methods of estimating trends , moving average methods , least square methods	4	10	1
5	Index Numbers : Need of index numbers, construction of index number, unweighted and weighted index number, price index numbers by Laspeyres, Paasche's and Fishers formula	2	5	6
6	Test of Hypothesis: Concept of Null and Alternative hypothesis, Large sample test, small sample test	4	5	
	Section II : Numerical Method			
1	Calculus of finite Differences: The Operators and E. Their simple properties are; inter-relations. Construction of a difference table, Factorial notation [definition of $x(n)$ and $x(-n)$] Newton's Theorem on expression of a polynomial in factorial notation, First and higher order differences of a polynomial, Separation of Symbol, Example and Problems.	4	10	2,5,4,3
2	Interpolation: Interpolation for arguments proceeding at equal intervals: Newton's forward difference a interpolation formula. Dividend difference operator: Construction of table for divided	4	10	2,5,4,3

	<p>difference symmetry of divided differences. Relation between divided differences and ordinary differences. Newton's divided difference formula for interpolation. Lagrange's interpolation formula. Examples and problems.</p>			
3	<p>Summation of Series: The Operators $\Delta^{-1} \Delta^{-1} = 1/\Delta$ Proof of the following result: If $u_x = \Delta f(x)$ then $\sum u_x = [f(x)]_{n+} + [\Delta u_x]$ Examples and problems. Summation of the series with the general term of the form Where $f(x)$ is a polynomial in x of degree Examples and problems</p>	4	5	2,5,4,3
4	<p>Approximate Integration: Notation of approximate integration Derivation of general quadratic formula. Derivation of trapezoidal rule, Simpson's 1/3rd and 3/8th rules as particular cases of above formula.</p>	2	5	2,5,4,3
5	<p>Index Numbers : Need of index numbers, construction of index number, unweighted and weighted index number, price index numbers by Laspeyres, Paasche's and Fishers formula</p>	2	5	2,5,4,3
6	<p>Test of Hypothesis: Concept of Null and Alternative hypothesis, Large sample test, small sample test</p>	4	10	2,5,4,3

References :

1. Freeman H. Mathematics for Actuarial students Part I
2. Gupta & Malik – Calculus of finite differences & numerical analysis
3. Richardson C H – Introduction to calculus of finite differences
4. Bernard and Child – Higher /algebrs
5. H.C Saxena – Calculus of finite differences
6. Goon , Gupta , Dasgupta – Fundamentals of statistics Vol I
7. Fundamentals of mathematical statistics

IT-34 OBJECT ORIENTED ANALYSIS AND DESIGN

Course Objectives :

After completing this course students will be able to:

- Understand the issues involved in implementing an object-oriented design
- Analyze requirements and produce an initial design
- Develop the design to the point where it is ready for implementation
- Design components to maximize their reuse
- Learn to use the essential modeling elements in the most recent release of the Unified Modeling Language - UML 2.0

Sr. No	Chapter details	Sessions	Marks %	References
1	Introduction:- <ul style="list-style-type: none"> • Two views of software Developments: SSAD and OOAD. • Why Object –Orientation? 	2		1,2,3
2	The Object Paradigm <ul style="list-style-type: none"> • Object and classes • Abstraction and encapsulation • Methods and Message • Interfaces , Inheritance and Polymorphism • Access Control The Business case for OO Developments.	3		1,2,3,4,5
3	Object Oriented Methodologies:- <ul style="list-style-type: none"> • Some of the object Oriented Methodology:- <ul style="list-style-type: none"> - Object Oriented Design - Booch - Object Modeling Techniques- Rumbaugh - Object – Oriented Analysis – Coad- Yourdan - Object – Oriented Software Engineering – Ivar Jacobson - Unified Approach • Diagramming and Notational Techniques using the UML :- • UML Notation • { Analysis Diagramming Techniques. } == Introduction to all (ten) Diagram • { Design Diagramming Techniques } 	6		4,5,6,7,8

	<ul style="list-style-type: none"> • Generalization / Specialization. • Aggregation and composition • Association , Cardinality, Navigability Icons , relationships and adornments. 			
4	<p>Object-Oriented Systems Development Process :</p> <ul style="list-style-type: none"> • Rational Unified Process <ul style="list-style-type: none"> - Four Major phases:- Inception , Elaboration, Construction, Transition • Requirements Engineering <ul style="list-style-type: none"> - Problem analysis. - Understanding Stockholders need - Type of requirements. - Use-case Model : Writing Requirements 	4		3,4,5
5	<p>Analysis:-</p> <ul style="list-style-type: none"> • Behavioral Analysis • Domain Analysis or Business Object Analysis • Use-case Driven Object Oriented analysis : The UML approach. <ul style="list-style-type: none"> - Develop use-case Model - Use-case Description, Documentation - Activity Diagram • Identify the classes. <ul style="list-style-type: none"> - Introduction to different approaches for identifying classes - “Noun Phrase” approach OR - “Conman Class Pattern” approach Or - “CRC” approach Or - Usecase Driven Approach. • Containment and Composition • Aggregation • Inheritance , SubTypes and IS-A Hierarchies. • Association and Link Relationships. • Diagramming System 	8		3,4,5

	Events.			
6	Design Phases:- <ul style="list-style-type: none"> • Translating Analysis Concept into Design. • Optimizing classes and Objects: The Multi-tiered Architecture View • Mapping System functions to objects. • Object to Object Visibility. • Collaboration Diagram • Sequential Diagram • Specification Class Diagram • Specifying Object Interfaces. • Designing the Data Access layer. • Design User Interface layer • Designing System Interfaces, Controls and Security. 	6		4,5,10
7	Design Refinement:- <ul style="list-style-type: none"> • Designing for Extensibility • Design for reusability. • Portioning class space • Checking Completeness and correctness. 	2		10
8	Persistent Object and Database Issues:- <ul style="list-style-type: none"> • The Cood Data Management Domain. • Object Persistence • Object-oriented Database Management System • Object- Oriented verses Relational Database. • Mapping object to Relational Data structure. 	3		4,5,10
9	Testing:- <ul style="list-style-type: none"> • Introduction to Testing Strategies. • Impact of Object Orientation on Testing. • Testing Business Process. • Design Matrix • Discovering reusable pattern. 	2		4,5

10	Patterns:- <ul style="list-style-type: none"> • Benefits of patterns. • Using patterns During Analysis. • Using Pattern During Design 	2		6
----	---	---	--	---

References

1. Object Oriented Analysis and Design with Applications, Grady Booch., Benjamin / Cummings , 1994.
2. Object –Oriented Modeling and Design. – J Rumbaugh , M Blaha , W .Premerlani
3. Principles of Object- Oriented Software Development , Anton Eliens , Addison Wesley.
4. Object Oriented System Development - Ali Bahrami . McGRAW-HILL International Edition.
5. Object-Oriented Software Engineering – Ivar Jacobson Pearson Education INC
6. Applying UML And Pattern - Craig Larman Pearson Education INC
7. UML Distilled - Martin flowler Pearson Education INC
8. The Unified Modeling Language User Guide – Grade Booch, James Rumbaugh , Ivar Jacobson. Pearson Education INC
9. The Unified Modeling Language Reference Guide – Grade Booch, James Rumbaugh , Ivar Jacobson. Pearson Education INC
10. Design Object- Oriented Software - Rebecea Wrifs- Brock. Brian Wilkerson, Lauren Wiener ,
11. Object Oriented Analysis and Design – Bennett , Simon McGraw Hill.
12. Designing Flexible Object Oriented System with UML – Charless Richter Techmedia
13. Instant UML – Muller – Apress LP
14. UML Instant – Thomas A Pendar – Wiley Publication
15. UML in Nutshell

IT 31P- MINI PROJECT BASED ON WEB SUPPORT TECHNOLOGIES

This Mini Project is based on the subject , Web Support Technologies in the Sem III. Simple projects such as static web site development , shopping carts application based on HTML , DHTML ,Javascript and Vbscript , that will give the students some idea about project concept. Documentation need not be stressed in this mini project.

IT 31L -C++ LAB

C++ Programming assignments based on class, inheritance, abstraction , encapsulation, dynamic binding , polymorphism, I/O systems , exception handling should be covered

Semester IV
IT 41 - JAVA PROGRAMMING

Course Objectives :

To enable the students to understand the core principles of the Java Language and use visual tools to produce well designed, effective applications and applets.

Sr. No	Chapter Details	Sessions	References
1	Introduction to Core Java <ul style="list-style-type: none"> • Class and Object • Object Oriented concepts with respect to Java • Interfaces, Packages • Exception Handling 	3	1,2,3,7
2	Applet As Java Applications <ul style="list-style-type: none"> • Applets specific methods & Related HTML references • Creating an Applet • Displaying it using Web Browser with appletviewer.exe • Advantages and Disadvantages of Applet Vs Applications 	3	1,2,7
3	Multithreading <ul style="list-style-type: none"> • Multithreading concepts • Thread Life cycle • Creating multithreaded application • Thread priorities • Thread synchronization 	4	1,2,7,8
4	Abstract Windows Toolkit <ul style="list-style-type: none"> • Components and Graphics • Containers, Frames and Panels • Layout Managers <ul style="list-style-type: none"> Border layout Flow layout Grid layout Card layout • AWT all components • Event delegation Model <ul style="list-style-type: none"> ○ Event source and handler ○ Event categories, Listeners, Interfaces ○ Anonymous classes • Swing Libraries <ul style="list-style-type: none"> ○ Model view Controller design pattern 	6	1,2,7

	<ul style="list-style-type: none"> ○ Different layout, menus dialog boxes , text input 		
5	<p>Java Input Output</p> <ul style="list-style-type: none"> • Java IO package • Byte/Character Stream • Buffered reader / writer • File reader / writer • Print writer • File Sequential / Random 	4	1,2,7,8
6	<p>Networking with Java</p> <ol style="list-style-type: none"> a. Networking basics <ol style="list-style-type: none"> i. Sockets, port ii. Proxy servers iii. Internet addressing 7 URL b. java.net – networking classes and interfaces c. Implementing TCP/IP based Server and Client d. Datagrams – Datagram packet, Datagram server and client e. URL connections 	4	7,8
7	<p>JDBC</p> <ul style="list-style-type: none"> • Java database connectivity, Tpes of JDBC drivers • Writing first JDBC applications • Types of statement objects(Statement, PreparedStatement and CallableStatement) • Types of resultset , ResultSetMetadata • Inserting and updating records • JDBC and AWT • Connection pooling 	4	6
8	<p>RMI</p> <ul style="list-style-type: none"> • Introduction & Architecture of RMI • Java.rmi classes and interfaces • Writing simple RMI application • Parameter passing in remote methods (marshalling and unmarshalling) • Introduction to CORBA 	4	6,8
9	<p>Java Beans</p> <ul style="list-style-type: none"> • Java Beans introduction, design pattern • Writing simple bean • Beans persistence and introspection • EJB 	4	6

	Architecture Container classes , Interfaces EJB types- Session, Entity, Message Driven		
10	Servlets <ul style="list-style-type: none"> • Introduction , Servlet Vs CGI • Servlet API Overview • Writing and running Simple Servlet. Servlet Life cycle • Generic Servlet, HTTPServlet • ServletConfig, ServletContext • Writing Servlet to handle Get and Post methods, Reading user request Data • Writing threadsafe servlet • Session tracking in servlets • Servlet and JDBC 	6	4,5,7

References:

- | | |
|--|---|
| 1. Core Java 2 Volume - I | By Cay S Horstmann, Fary Cornell |
| 2. Core Java 2 Volume - II | By Cay S Horstmann, Fary Cornell |
| 3. Programming with Java, A Primer | By E.Balguruswami |
| 4. Inside Servlets | By Dustine R Callway |
| 5. Developing Java Servlets | By James Goodwill |
| 6. Complete Reference- J2EE | By Jim Keogh |
| 7. Java 2 Complete Reference | By Patric Naughton, Herbert Schildt |
| 8. Beginning Java Networking
others | By Chad Darby, John Griffin &
others |

IT 42- APPLICATION DEVELOPMENT TECHNOLOGIES

GUIDELINES FOR SUBJECT :

- A. Study of Application framework
 - Traditional Applications
 - Business Applications
 - Web Applications
- B. Application Development components
 - Forma
 - Reports
 - Menus
 - Reusable components – COM / DCOM / Interface , packages and assemblies
- C. Application Deployment strategies
 - Run time environments – JUM , VBRUN , Tomcat / strut / Ant
 - Application packaging – Instashield , Windows Installer , Rpmbuild etc

Various application development environment such as

1. Visual Studio . Net
2. Oracle Application Server , HTMLDB
3. Strut
4. NetBeans
5. PowerBuilder

Can be used. The faculty / institutes can decide the suitable development environment.

BM41-SOFT SKILLS

Objectives:

1. To encourage the all round development of students by focusing on soft skills.
2. To make student aware about the importance, the role and the content of soft skills through instruction, knowledge acquisition, and practice.
3. To develop and nurture the soft skills that help develop student as a team member, leader, and all round professional in long run have been identified and listed here for references. As the time professional in long run have been identified and listed here for references the time allotment for the soft skill laboratory as small and the fact that the skills are nurtured over years, students are encouraged to follow these skills as self study and self driven process.

Sr. No	Chapter Details	Sessions	Marks %	References
1	Self Development and Assessment 1.1 Self-Assessment 1.2 Self-Awareness, 1.3 Perception and Attitudes 1.4 Values and Belief System 1.5 Personal Goal Setting 1.6 Career Planning, 1.7 Self-Esteem, 1.8 Building of Self-Confidence	15	20	
2	Components of communication , Principles of communication barriers , listening skills Verbal Communication 2.1 Includes Planning 2.2 Preparation 2.3 Delivery, Feedback and Assessment of activities like a. Public speaking b. Group Discussion c. Oral Presentation skills, Perfect Interview d. Listening and observation skills, Body language 2.4 Use of Presentation graphics, 2.5 Use of Presentation aids, Study of communication.	15	10	
3	Written Communication	18	15	

	<p>3.1 Technical Writing–Technical Reports</p> <p>3.2 Project Proposals,</p> <p>3.3 Brochures,</p> <p>3.4 Newsletters,</p> <p>3.5 Technical Articles</p> <p>3.6 Technical Manuals</p> <p>3.7 Official/Business Correspondence</p> <p>a. Business letters</p> <p>b. Memos</p> <p>c. Progress report, Minutes of meeting, Event reporting, Use of style, Grammar and Vocabulary for effective technical writing,</p> <p>d. Use of : Tools, Guidelines for technical writing, Publishing</p>			
4	<p>Ethics and Etiquettes</p> <p>4.1 Business Ethics</p> <p>4.2 Etiquettes in social as well as Office settings</p> <p>4.3 Email etiquettes</p> <p>4.4 Telephone Etiquettes</p> <p>4.5 Engineering ethics and ethics as an IT professional, Civic Sense.</p>	6	15	
5	<p>Other Skills</p> <p>5.1 Managing time</p> <p>5.2 Meditation</p> <p>5.3 Understanding roles of Engineer and their Responsibility</p> <p>5.4 Exposure to work environment And culture in today's job Places</p> <p>5.5 Improving Personal Memory, Study skills that include Rapid reading, Notes taking, Complex problem solving, creativity.</p>	8	20	

References for students for self-improvement by self-study

Topic 1 : Any good book like

1. You Can Win – Shiv Khera – Macmillan Books – 2003 Revised Edition
2. 7 Habits of Highly effective people – Stephen Covey
3. Business Communication ? Asha Kaul
4. Business Communication - M. Balasubramanyam

Topic 2 and 3

1. John Collin, “Perfect Presentation”, Video Arts MARSHAL
2. Jenny Rogers “ Effective Interviews”, Video Arts MARSHAL
3. Raman Sharma, “ Technical Communications”, OXFORD
4. Sharon Gerson, Steven Gerson “Technical writing process and product”, Pearson Education Asia, LPE third edition.
5. R. Sharma, K. Mohan, Business correspondence and report writing”, TAG McGraw Hill ISBN 0-07-044555-9
6. Video for technical education catalog, National education and Information Films Ltd. Mumbai.
7. Management training and development catalog, National education and Information Films Ltd. Mumbai.
8. XEBEC, “Presentation Book 1,2,3”, Tata McGraw-Hill, 2000,ISBN 0-40221-3

Topic 4 and 5

1. Tim Hindle, “Reducing Stress”, Essential Manager series Dk Publishing
2. Sheila Cameron, “Business student Handbook”, Pitman Publishing
3. Dr. R. L. Bhatia, “ Managing time for competitive edge”
4. Lorayne Lucas “Memory Book”
5. Robert Heller, “Effective leadership”, Essential Manager series Dk Publishing
9. Newstrom Keith Davis,” Organizational Behavior”, Tata McGraw-Hill, 0-07-460358-2

It is proposed that expert from industry be invited to conduct lectures and workshops to understand the industry soft-skill requirement.

Guidelines for term-work : Marks 50

List Of Possible Assignments:

1. Write a personal essay and or resume or statement of purpose which may include:
 - Who am I (family background, past achievements, past activities of significance)
 - Strength and weakness (how to tackle them) (SWOT analysis)
 - Personal Short-term Goals, long term goals and action plan to achieve them
 - Self assessment on soft-skills

2. Student could review and present to a group from the following ideas
 - Book review
 - Biographical Sketch
 - Any topic such as an inspirational story/personal values/beliefs/current topic
 - Ethics and etiquettes and social responsibilities as professional.
- 3 Student will present to a group from the following ideas
 - Multimedia based oral presentation on any topic of choice (Business/Technical)
 - Public speaking exercise in the form of debate or elocution on any topic of choice
- 4 Student will undergo two activities related to verbal/non-verbal skills from following
 - Appearing for mock personal interviews
 - Participating in group discussion on current affairs/Social Issue/ethics and etiquettes
 - Participating in games, role-playing exercises to highlight nonverbal skills.
- 5 Student will submit one technical document from the following:
 - Project proposal
 - Product brochure
 - Literature survey on any one topic
 - User Manual
 - Technical Help
- 6 Student will submit one business document from the following
 - A representative official correspondence
 - Minutes of meeting
 - Work progress report
- 7 Students will participate in one or two activities from following:
 - Team games for team building
 - Situational games fro role playing as leaders, members
 - Organizing mock events
 - Conducting meetings
- 8 Faculty may arrange one or more sessions from following :
 - Yoga and mediation
 - Stress management, relaxation exercises and fitness exercises
 - Time management and personal planning sessions
 - Improving memory skills
 - Improving leadership skills
 - Improving English conversation skills
 - Reading comprehension skills & notes taking skills
9. Students' own SWOT Analysis

Students are expected to keep a personal record of any six activities that they conduct in the soft skill laboratory in the form of a journal. All students need note to do the same assignments. Institute having a freedom within the framework to customize set of activities to be followed.

Assessment Guidelines for term-work assessment

- | | |
|--|----------|
| 1. Written Communications | 20 marks |
| <ul style="list-style-type: none"> - Students could submit for example - Personal resume, essay - Technical document or business document | |
| 2. Spoken communication | 20 marks |
| <ul style="list-style-type: none"> - One elocution event of say 8-10 minutes individually - One group discussion or group presentation event | |
| 3. Overall participation in soft skills based lab activities | 10 marks |
| <ul style="list-style-type: none"> - Attendance and enthusiasm - Participation and contribution in event management, organizing - Group games, group exercises, interpersonal skills observed - Quality of journal for soft skills laboratory indicating personal progress, participation. | |

Guidelines for batch wise Time management for laboratory sessions (Two hour session at a time)

1. Batches could be of size 25 to 30 students.
2. Written communication exercises could be done for whole batch at same time.
(3 sessions)
3. Spoken communications exercises can be done with around 10-15 students covered in one two hour slot so total need for exercises.
(2 sessions).
4. Group discussions could be done for groups of 5-8 students at a time for half so total need for two group discussions for each student of the batch will be required.
(2 sessions)
5. Sessions could be organized for trainers to give directions, knowledge, experience sharing or common viewing of training material on Video etc.
(4 sessions)
6. Group exercises for team building, role playing and interaction with professional.
(3 sessions)

IT43-SOFTWARE ENGINEERING

Sr. No.	Chapter Details	Sessions	Marks %	References
	<p>Prerequisite Emergence of Software Engineering Classical sequential software life-cycle model, waterfall model, prototyping-oriented life-cycle model – throwaway and incremental ,spiral model.</p>	2	NIL	1,8,9
1.	Chapter 1:Current trends in Software Engineering	4	10	1
2.	<p>1.1 Software Engineering for projects & products .</p> <p>1.2 Introduction to Web Engineering and Agile process</p> <p>2a: Software requirement Specification(SRS)</p> <p>2.1aStructure and contents of the requirements specification analysis modeling, types of requirements - functional and non-functional , Quality criteria, requirements definition ,SRS format, Fundamental problems in defining requirements</p> <p>2.2aStructure and standards followed for SRS</p> <p>2.3a characteristics of good SRS – Unambiguous , complete , verifiable , consistent , modifiable , traceable , usable during maintenance</p>	10(2a & 2b)	25	1,2,10
2b	<p>Software Inspection</p> <p>Inspection team , members , process , steps , documents , checklist , defect recording and recommendation format , evaluation of inspection process , benefits.</p>			

3.	System Analysis and Design Approach 3.1 Role of system analyst 3.2 Analysis tools and techniques , DFD , ERD, Project library 3.3 Case studies based on Software analysis tools 3.4 Object oriented analysis – only Introduction 3.5 Software design Approach: Structured Programming, Prototyping, structured Charts(Modular Approach)	10	25	1,6,8,9
4.	Design Methods: 4.1 Data design 4.2 Architectural Design 4.3 Procedural Design 4.4 Interface Design 4.5 Code design	3	8	1,4,5,8
5.	Documentation 5.1 Types 5.2 Role of documentation in maintenance	3	8	10,8
6.	Maintenance 6.1 Types of Maintenance 6.2 Maintenance Cost 6.3 Reverse Engineering 6.4 Introduction to legacy systems	5	12	1,3,10
7.	CASE TOOLS CASE tools , types – project mgt., analysis , designing , programming , prototyping , maintenance , advantages of using CASE tools , I-CASE , future of CASE	5	12	1,4,5,9

References

1. Software Engineering by Pressman
2. System Analysis and Design by Jalote
3. Software Engineering by Sommerville
4. Software Engineering - W S Jawadkar
5. System Analysis & Design methods – Whiten, Bentley
6. System Analysis & Design – Elias Awad
7. Object Oriented Modelling & Design – James Rumbaugh
8. Analysis & Design of Information System – James Senn
9. Analysis & Design of Information System – V. Rajaraman
10. Software Engineering Concepts-Richard Fairley

MT41-OPTIMIZATION TECHNIQUES

Srno	Chapter details	Sessions	Marks %	References
1	<p>Chapter 1: Linear Programming Various definitions, statements of basic theorems and properties, Advantages, Limitations and Application areas of Linear Programming</p> <p>Linear Programming – The Graphical method – Graphical Solution methods of Linear Programming problem, Maximization Linear Programming problem, Maximization Problem.</p> <p>Linear Programming – Simplex Method – Phase I and Phase II of the Simplex Method, The Revised Simplex method, Primal and Dual Simplex Method, Simplex Algorithm for maximization case, Simplex Algorithm for minimization case – Two phase method and the Big –M method.</p> <p>Transportation Problem and its solution, Assignment Problem and its solutions by Hungarian Method</p>	15	30%	5,8,6
2	<p>Chapter 2: Integer Programming Gomory Cutting Plan Methods – Branch and Bound Method</p>	5	10%	2,5
3	<p>Chapter 3: Queuing Theory Characteristics of Queuing Models. Transient and Steady states of the System.</p> <p>Model – I [(M/M/1) : (FCFS / ∞ / ∞)]</p> <p>Model II – Generalization of Model [(M/M/1) : (FCFS / ∞ / ∞)] (Birth- Death Process)</p> <p>[(M/M/1) : (FCFS / N/ ∞)] (Finite Queue Length Model)</p>	8	10%	2,5
4	<p>Chapter 4: Replacement Theory Replacement of items that deteriorates. Replacement of items that fails suddenly, Individuals and Group Replacement- Policy.</p>	04	10%	3,1

5	Chapter 5: INVENTORY THEORY Inventory Model Building, Single item deterministic Model, Inventory Control Models without strategies and Inventory Control Models with shortages.	5	10%	4,8
6	Chapter 6: PERT & CPM Basic differences between PERT and CPM. Arrow Networks, time estimates, earliest expected time, latest – allowable occurrences time, Forward Pass Computation, Backward Pass Computation, Representation in Tabular Form Critical Path, Probability of meeting scheduled date of completion, Calculation on CPM network. Various floats for activities, Critical path updating projects. Operation time cost tradeoff Curve project , Time cost – tradeoff Curve- Selection of schedule based on Cost Analysis, Crashing the network.	10	30%	5,6,7,8

References :

1. Introduction to Operation Research : A Computer Oriented Algorithm Approach
By Filet B. E.
2. Fundamental of Queuing Theory By Gross D. and Ilaris C.M.
3. Introduction to Operation Research By Hiller F. and Lieberman G. J.
4. Mathematical Programming technique By Kambo N.S.
5. Operations Research By Kanti swarup, Gupta P.K. and ManMohan.
6. Optimization Methods in Operations Research and System Analysis By Mital K.V.
7. The Critical Path Method By Saffer L.R., Fitter J.B. and Meyer W.L.
8. Operation Research By J.K. Sharma
9. Operation Research By. Taha H.A.

BME1 – MANAGEMENT ELECTIVE**BME1-MIS FRAMEWORK AND IMPLEMENTATION**

Sr No.	Chapter details	Marks %	Sessions	References
1	1.1 This course will discuss a variety of framework for identifying information technology applications. 1.2 The scope of IT applications would cover Management Information System. 1.3 Decision Support System. Executive Information System and Expert System.	8	15%	1,2
2	2.1 Provide broad understanding of the types of the benefits information technology applications can provide in an organization through transaction processing, management and operational control decision support system, office automation, organizational communications and group work support.	10	25%	1,2
3	3.1 Socio-economic environment and information systems in organization and the impact. And impact of Information systems on Organization's markets, frameworks of Information systems planning information system and competitive advantage 3.2 The new strategic role of Information systems , methodologies for evaluating investments in IT 3.3 Framework and methodologies should be discussed and illustrated with case studies	12	30%	1,2
4	4.1 Critical success factor in implementing IT applications including the lead for managing it process of change, illustrated through case studies 4.2 Study of successful / failed IT projects. 4.3 Critical role of security in implementing IT application should be discussed	10	30%	1,2

References :

1. Business Information Systems
2. Website links : www.misframework.com

BM E1 – FOUNDATIONS OF DECISION PROCESSES

Sr No.	Chapter details	Marks %	Sessions	References
1	1.4 Role of decision making in management 1.5 Framework 1.6 Criteria under conditions of certainty, risk and uncertainty Bytes Theorem. Sequential decision making decision tree analysis.	10	25%	1,2
2	2.1 Theory of utility, Utility function curve. 2.2 Competitive strategies, game theory. 2.3 Single Channel 2.4 Single phase waiting line model with Poisson. 2.5 Distributed arrival rates and exponentially distributed service times. 2.6 Markov models.	10	25%	1,2
3	3.1 Simulations: Monte Carlo, Application to queuing and inventory models. 3.2 Applications in functional areas of marketing, production, finance, Behavioral aspects in decision making. 3.3 Open and Closed models of decisions	10	25%	1,2
4	4.2 Systematic problem analysis and decision making. 4.2 Decision making in functional areas– case studies.	10	25%	1,2

Reference:

1. Decision analysis By Gregory G.
2. Quantitative Techniques for Business Decisions By Johnson R. D.

BME1 – INFORMATION SYSTEM AUDIT

Prerequisites: IT fundamentals , Computer operations , Network concepts , and Internet concepts, Exposure to programming languages , Exposure to SSAD and Database concepts, Commercial Applications, Management Concepts and Practice

Sr no	Chapter details	Sessions	Marks %	References
1	Auditing concepts	1	10	2,3
	ISA need , concept, standards , performance, steps , techniques , methodologies , around and through computer.	2	10	2,1,3
2	Controls – Concept objectives, types, risk, exposure	2	8	2,3
3	IT environment – hardware, system software, OS, DBMS, Infrastructure, network concepts, Personnel, documentation, review of performance, procurement, and other controls	3	10	2,4
	Network concepts, LAN, WAN, Client-Server architecture, Internet, EDI, e-mail, encryption, digital signatures – review of performance, procurement and other controls.	5	12	2,3,4
4	Software procurement and development –SDLC – Meaning and IS auditor’s role-traditional SSAD , OOM , prototyping , 4GL , project management , testing , implementation review.	4	8	2,1
5	Is-operations -planning, organizing, scheduling, SCM, problem management , record management, QA and QC , review and controls	3	8	2,3
6	Controls – Input , process , validation , output, logical access, physical access , database , network , environment , BCP	8	10	2,4
7	Evidence collection, evaluation and reporting methodologies	2	5	2,5,1
8	IS strategies and management – organization structure , long term and short term plans , steering and other committees , HR policies , segregation of duties	2	8	2,4
9	IT crimes , viruses , security , privacy	2	4	2,3

	issues			
10	Broad introduction to concepts and practice of e-commerce and legal framework for e-commerce	2	4	
11	Case studies and assignments	4	10	2,3

Note :

- Two case studies and two assignments need also be covered.
- The syllabus is expected to be completed within approx 40 sessions of 90 minutes each. Session-wise suggested contents are enclosed
- Many topics will have to be covered at a broad level only.
- Role of IS auditor and relation of each topic to ISA controls and review should be part of all lectures. Emphasis should be on Audit , security, control, review and documentation aspects and usage of relevant standards as relevant to all the IT facets.

References :

1. Names of ISA related material is given. For all other IT related topics, e.g. EIT , SSAD , DBMS , Network etc various standard books are available in the market and also recommended by the University.
2. “EDP Auditing Conceptual Foundations And Practices” by Ron Weber – McGraw-Hill publication
3. Latest CISA review manual by ISACA , USA – This may be procured by individual institutes and made available to students on library basis
4. IS audit standards and control objectives of ISAXA which are non-copyrighted and relevant , refer www.isaca.org
5. IS control journals from ISACA

BME1-COLLABORATIVE MANAGEMENT

Srno	Chapter details	Sessions	Marks %	References
1	Significance of Planning : Types, Needs, Requisites, Corporate Planning, System approach, Role of the Planner, Corporate Planning and Budgeting.	5	20	
2	Strategic Management : An introduction, Concept and characteristics of strategic management, stakeholders in business, Strategy formulation ? Analysis of Environmental opportunities and threats, formation of organizational vision, mission and objectives, Strategic Analysis and choice ? Corporate Portfolio analysis, SWOT analysis and GAP analysis, Porter's 5 forces model of competition, Mc Kinsey's 7s framework, GE 9 cell model, Distinctive competitiveness, Selection of matrix Design of strategic business units, Strategy Implementation, Resource allocation, Strategy Evaluation.	15	40	
3	Social Responsibilities : Scope, Contents, Cooperation and Society, Consumers, Cooperation and Democracy and Government. Social responsibility Vs. Profitability and Productivity, Professionalism as means of Social Behaviour.	4	15	
4	Means of Collaboration : Merger and Acquisition, Joint Ventures, Strategic Alliances, Lease Financing, Venture Capital, Outsourcing.	8	25	

Reference:

1. Business policy by A. Kazmi
2. Exploring corporate Strategy by Johnson G.
3. Business policy and Strategic management by Nair
4. Business policy and Strategic management by Ghosh
5. Lease Financing in India by Naidu
6. Lease Financing theory and practice by Brahmaiah
7. Financial Management by Khan and Jain
8. Financial Management by Prasanna Chandra

BME1 – DECISION SUPPORT SYSTEMS

Srno	Chapter Details	Sessions	Marks %	References
1	Decision Support Systems :An Overview 1.1 Decision Support Systems (DSS) Concept 1.2 DSS : Deterministic Systems 1.3 Artificial Intelligence 1.4 Knowledge Based Expert Systems 1.5 MIS and Role of DSS	5	10	1,2
2	Data warehouse , Access , Analysis , Mining and Visualization for DSS 2.1 Data warehousing , access ,analysis and visualization 2.2 Data collection problems and quality 2.3 Internet and commercial database service 2.4 Database Mgt System for DSS 2.5 Database organization structure for DSS 2.6 Data warehousing 2.7 OLAP 2.8 Data mining 2.9 Data Visualization 2.10 GIS and virtual reality 2.11 Business Intelligence	10	25	1,2
3	DSS Development 3.1 Introduction to DSS development 3.2 Traditional system development life cycle 3.3 Alternate development methodologies 3.4 Prototyping :DSS Methodology	8	10	1,2
4	Tools for DSS development 4.1 DSS Technology levels and tools 4.2 DSS development platform 4.3 4.3 DSS development tools selection 4.4 Team – developed DSS 4.5 End user Developed DSS 4.6 Development of DSS : Putting system together 4.7 DSS future	10	25	1,2
5	Enterprise Decision Support System 5.1 Enterprise system : Concept and definition	5	25	1,2

	<p>5.2 Evolution of executive and enterprise information system</p> <p>5.3 Characteristics and capabilities of ESS</p> <p>5.4 Comparing and integrating EIS and DSS</p> <p>5.5 EIS , data access, data warehousing, OLAP , multidimensional analysis, presentation</p> <p>5.6 Including soft information in enterprise systems</p> <p>5.7 Organizational DSS</p> <p>5.8 Supply and value chain and decision support</p> <p>5.9 Computerised systems – MRP , ERP , SCM</p> <p>5.10 Frontline DSS</p> <p>5.11 Future of DSS and EIS</p>			
6	<p>Implementation , integration and impacts</p> <p>6.1 Implementation : an overview</p> <p>6.2 The major issues of implementation</p> <p>6.3 Implementation strategies</p> <p>6.4 System Integration: What and Why?</p> <p>6.5 Generic models of MSS integration</p> <p>6.6 Models of ES and DSS integration</p> <p>6.7 Integration of EIS , DSS and ES</p> <p>6.8 Intelligent DSS</p> <p>6.9 Intelligent modeling</p> <p>6.10 Examples of integrated systems</p>	5	15	1,2

References :

1. Decision Support Systems and Intelligent systems by Efrain Turbon
2. Management Information Systems by W S Jawadekar

BME1-INVESTMENT TECHNOLOGY

Sr. No	Chapter Details	Session	Marks %	References
1	Source of Investment information	5	15	1,2
2	Valuation of debt securities-Debt prices & interest rate risk and purchasing power risk. Market interest rates and term structure of interest rates. Valuation of warrants & convertibles. Option pricing models.	10	25	1,2
3	Valuation of equity shares-Dividends & valuation: MMS arguments, fundamental analysis. Earning multipliers. Timing of purchase and sale of equity shares. Estimating earnings & risk.	15	30	1,2
4	Portfolio theory: efficient investments and diversification. Markowitz graphical portfolio analysis. Capital market theory. Portfolio performance evaluation shape. Treynor Jenson measures. Mutual Funds-kinds and evaluation-Behaviour of share prices-technical analysis. The efficient markets. Hypothesis-random walk and Martingle methods.	10	30	1,2

Reference:

1. Financial Management: A capital Market Approach by Clark J.J.
2. Investments By Sharpe W.F.

IT 41L JAVA PROGRAMMING LAB

Assignments on Java concepts such as Interfaces, Packages, Exception Handling ,Applet, multithreading, Abstract Windows Toolkit, Java Input Output, Networking ,JDBC, RMI ,Java Beans ,Servlets can be included.

IT 42 L APPLICATION DEVELOPMENT TECHNOLOGY LAB

Guidelines for this subject are specified. Relevant assignment can be designed and included in the labwork.

Semester V

IT51 : SOFTWARE TESTING & QUALITY ASSURANCE

Sr. No	Chapter Details	Session	Marks %	References
I	Software Quality Assurance	10		
	1. Quality Concept 1.1 Definition of Quality, QA, SQA 1.2 Quality factors 1.3 Software Quality Metrics 1.4 Process Improvement 1.4.1 Process and Product Quality 1.4.2 The SEI Process Capability Maturity model, ISO, Six-Sigma 1.4.3 Process Classification	4	10	1,2
	2. Software Quality Assurance 2.1 Need for SQA 2.2 SQA Activities 2.3 Building blocks of SQA 2.4 SQA Planning & Standards	2	10	1
	3. Software Reliability 3.1 Reliability Measures 3.2 Reliability models	2	6	1
	4. Verification & Validation 4.1 Verification & Validation Planning 4.2 Software inspections 4.3 Automated static Analysis 4.4 Clean room Software Development	2	6	1,2
II	Software Testing			
	5 Software Testing Fundamentals 5.1 Testing objectives 5.2. How test information flows 5.3 Testing lifecycle 5.4 Test Cases – What it is?, Test Case Designing (Concept & introduction should be covered here. Detailed techniques should be covered in Unit No. 2.4)	4	10	1, 5,4
	6 Levels of Testing 6.1 Unit Testing 6.2 Integration Testing 6.3 System Testing 6.4 Acceptance Testing 6.4.1 Alpha testing & Beta testing 6.5 Static vs. Dynamic testing	5	12	3, 4, 5

	6.6 Manual vs. Automatic testing 6.7 Testers workbench 6.8 11 steps of testing process (Only steps should be covered)			
	7. Different types of Testing 7.1 Installation Testing 7.2 Usability testing 7.3 Regression testing 7.4 Performance Testing 7.4.1 Load Testing 7.4.2 stress testing 7.5 Security testing 8. Static & Dynamic Testing 8.1 Static Testing Techniques 8.2 Review types : Informal Review, Technical or peer review, Walkthrough, Inspection, static analysis 8.3 Review Meeting , 8.4 Review Reporting & Record keeping, Review guidelines & Review checklist 8.5 Data flow analysis 8.6 Control flow analysis 8.7 Cyclometric Analysis 8.8 Dynamic testing – need & Advantages	2 4	6 10	1, 5 1,5,6
	9 Black Box & White Box Testing (Test Case Design Techniques) 9.1 Functional Testing (Black Box) Equivalence partitioning, BVA, Cause-Effect graphing, Syntax testing (Concept & Test case generation only) 9.2 Structural Testing (White Box) Coverage testing, Statement coverage, Branch & decision coverage, Path coverage 9.3 Domain Testing 9.4 Non functional testing techniques 9.5 Validation testing Activities Low level testing, High level testing 9.6 Black box vs. White Box	8	15	1, 5,6
	10 Testing specialized Systems and Applications 10.1 Testing object oriented software 10.2 Testing Web based Applications	8	15	3, 4
	10.3 Computer Aided Software testing tools (CAST) (only type & their purpose should be covered)			

Reference:

- A. Software Engineering by R. Pressmen – 6th Ed
- B. Software Engineering by Sommerville
- C. Introducing Software Testing by Louise Tamres
- D. Effective Methods for software Testing by William Perry
- E. Software Testing in Real World by Edward Kit
- F. Software Testing Techniques by Boris Beizer

IT52 -ADVANCED INTERNET TECHNOLOGY

Sr. No	Chapter Details	Session	Marks %	Reference
1.	E-Commerce Introduction: E-commerce as Business need,E-com Types, Advantages, Disadvantages, e-Commerce Architecture, Internet Payment Systems - Characteristics - 4C Payment Methods - SET Protocol for Credit Card Payment - E-Cash, E- Check - Overview of Smart Card E-Commerce security - Need of security - Encryption: Public Private & Hybrid - Digital Signature - Authentication	6		1
2.	Internet Basics - An overview of the internet, History of the web, web system architecture and uniform resource locator - HTTP protocol basics, HTTP request and response, - cookies basics, HTTP /1.1	3		1,2
3.	PERL & CGI -CGI Architecture -PERL features -Variables & operators, controll Statements -Working with Strings And Arrays -File Handling -Pattern matching & formatting -Creating and using sbroulines -Using PERL for CGI scripting Note: Apache Http Server is used at server side	5		3
4.	ASP - Introduction to ASP - Working with simple ASP pages - Request, Response, Application, Server, Session & Cookie objects -Working with Cookies and Managing Sessions -Role of Global.asa -ASP & databases: retriving storing & manipulating Data -Error Handling in ASP Note: IIS Server is used at server side	7		4,5
5	JSP	7		6,7

Sr. No	Chapter Details	Session	Marks %	Reference
	Why JSP? JSP Directives, writing simple JSP page Scripting Elements. JSP Actions: JSP & Java Beans JSP Actions: include, forward and plugin, Managing sessions using JSP Deafault objects in JSP JSP & Databases Error Handling in JSP Introduction to custom tag Note: Tomcat Container is used at server side			
6	PHP Obtaining, Installing and Configuring PHP Introduction PHP and the Web Server Architecture Model Overview of PHP Capabilities CGI vs. Shared Object Model PHP HTML Embedding Tags and Syntax Simple PHP Script Example PHP and HTTP Environment Variables PHP Language Core Variables, Constants and Data Types, and Operators Decision Making , Flow Control and Loops Working with Arrays Strings and functions Outputting Data, Include and Require Statements File and Directory Access Operations Error Handling and Reporting Considerations Processing HTML Form Input from the User Creating a Dynamic HTML Form with PHP Login and Authenticating Users Using GET, POST, SESSION, and COOKIE variables Session Management and Variables Working with Cookies, Sending Email Introduction to Object-oriented PHP: Classes and Constructors Database Operations with PHP Built-in Database Functions, Connecting to a MySQL(or Any Other Database), Selecting a Database, Building and Sending the Query to Database Engine, Retrieving , Updating and Inserting Data Note: Apache Http Server is used at server side	12		8,9

References:

1. E- Commerce Fundamentals & Application - Wiley publications
Authors- Henry Chan, Raymond Lee, Tharam Dillin, Elizabeth Chang
2. Inside Servlet – Dustin R. Callway, Person Education Asia Publication
3. Teach Yourself PERL in 21 days- Pearson Education
4. Complete Reference ASP
5. Beginning ASP 3.0 – Wrox Press
6. Professional JSP- Wrox Press
7. Java server Programming Volume-I – Wrox Press
8. Beginning PHP, Apache, MySQL Web Development
9. Linux Programming – Wrox Press

IT 53 – EMERGING TRENDS IN INFORMATION TECHNOLOGY

Sr. No	Chapter Details	Session	Marks %	Reference
1	E-Commerce : Model of E-Commerce, Application with respect to models, BPR & E-Commerce, Creation of E-Commerce sites (ethics): com/edu/org sites, Introduction to ERP Packages.	6		
2	CRM : Sales, Marketing and Service Management, What is BPO/BCP, Why it is required, Guidelines, Merits/De- Merits, Call Center – brief perspective technology wise, Functioning, Ethics, Disaster Recovery Management, Case Study	4		
3	E-Banking: Transactions: Inter Banking, Intra Banking, Electronic Payments,(Payment – Gateway Example) Securities in E-banking (SSL, Digital Signatures – Examples) Services Provided: - ATM, Smart Card ECS(Electronic Clearing System) e.g. Telephone, Electricity Bills	5		
4	Content Management And Disseminations: E-learning – Models WBT, CBT, Virtual Campus, LMS & LCMS, Video Conferencing, Chatting Bulleting, Building Online Community, Asynchronous/ Synchronous Learning, Case Study	3		
5	E – Logistics: Logistics & Supplier Chain Management, Warehousing Management, Transportation/ Distribution Management	3		
6	E – Governance & E – Agriculture: E –Governance Models : (G2B,G2C,C2G,G2G), Challenges to E – Governance, Strategies and tactics for	6		

	implementation of E – Governance, Types of Agriculture information (Soil, Water, Seeds, Market rate) & Technique dissemination , Future trade marketing, Corp Management, Query redresses System, (Information Kiosk, IVR etc), Case Study			
7	Knowledge management: What is KM? (Components and Type of Knowledge), Knowledge Building Models, KM Cycle & KM architecture, KM tools, KM approaches	3		
8	GIS/GPS: What is GIS?, Nature of Geographic data, Spatial Objects & Data Models, Getting map on Computers, GIS standards & Standardization Process of GIS development, Implementation and Deployment phases	3		
9	Biometric Technologies RFID, Retina Scanning, Facial Reorganization, Finger Print scanning, hand geometry , DNA (Working principles) Application area :-Case Study	3		
10	Embedded Systems: Features and Type of Embedded Systems, Components of Embedded System, Application of Embedded System, Palm Devices	3		

References :

1. Management Information System : Jawadekar
2. Management Information Sytem : Laudon & Laudon
3. E – Commerce : Milind Oka
4. E – Commerce : C.V.S. Murty
5. Fire Wall and Internet Security: William Cheswick , Stevens , Aviel Rubin
6. The Essential Guide to Knowledge management : Ambrit Tiwana
7. The GIS Book : George B. Karte.
8. Internet (Use of Search Engines Google & yahoo etc)

BM51- SOFTWARE PROJECT MANAGEMENT

Sr. No	Chapter Details	Sessions	Marks %	Reference
1.	Project Management Framework 1.1 Overview of project Management 1.2 Project Organization 1.3 Planning a s/w project 1.4 Project management life cycle 1.5 Risk management 1.5.1 Identification of Risks 1.5.2 Risk Analysis 1.5.3 Risk Planning & Monitoring	6	20	2,3,6
2	S/w Project Estimation 2.1 Project Estimation 2.2 Different methods of estimation (COCOMO model, Delphi cost estimation etc.) 2.3 Function point analysis	6	20	2,3,4
3.	Project Management Tools & Techniques 3.1 PERT & Gantt Charts 3.2 Introduction to Microsoft Project	3	10	6
4.	Software Quality Management & Testing 4.1 Quality Assurance & Standards 4.2 Quality Planning 4.3 Quality control 4.4 Role of testing in Software development 4.5 Testing Procedure 4.6 Defect Management	5	15	5,6
5.	Configuration Management(CM) 5.1 CM planning 5.2 Change Management 5.3. Version and Release Management 5.4 Configuration Management Tools	5	15	2, 3,4,5

6.	S/W Team Management 6.1 Characteristics of Performance management 6.2 High performance Directive and collaborative styles 6.3 Team Structure 6.4 Team Communication 6.5 Managing customer expectations 6.6 Group Behavior	3	10	4
7.	Role of User in Projects 7.1 User role in project management 7.2 User role in various stages of S/W Development 7.3 User role in System implementation	2	10	4

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

IT54P : MINI PROJECT

The objective of this mini project is to gear up student for preparation of final project in Semester-VI. Student will select individually Commercial or Technical project based on Application Development Technologies learnt in Semester IV. Each student will have to prepare proper documentation consisting of SRS, Modeling Techniques, Development Strategies and Implementation and Testing Strategies. Student may use any Design Methodologies such as SSAD, OOAD and UML etc. This is a documentation project only. The project work will be presented by student using Power Point Presentation Tool to the panel of internal teachers appointed by the Director of the concerned Institute/College. The Institute may appoint external expert from industry or academics if it feels so. The students will be assessed internally by such panel for this project.

ITE1 – IT Elective
ITE1-DISTRIBUTED DATABASE MANAGEMENT SYSTEM

Sr. No	Chapter Details	Session	Marks %	Reference
1	INTRODUCTION Distributed data processing; What is a DDBMS; Advantages and disadvantages of DDBMS; Problem areas, Overview of database and computer network concepts	3	8	3
2	DISTRIBUTED DATABASE MANAGEMENT SYSTEM ARCHITECTURE Transparencies in a distributed DBMS; Distributed DBMS architecture; Global directory issues	3	8	3
3	DISTRIBUTED DATABASE DESIGN Alternative design strategies; Distributed design issues; Fragmentation, Data allocation	3	8	1,3
4	QUERY PROCESSING ISSUES Objectives of query processing; Characterization of query processors, Layers of query processing; Query decomposition; Localization of distributed data	3	8	1,3
5	OPTIMIZING DISTRIBUTED QUERIES Factors governing query optimization; Centralized query optimization ,Ordering of fragment queries; Distributed query optimization algorithms	3	8	3
6	DISTRIBUTED OBJECT MANAGEMENT Object model features; Fundamental object management issues, DOM architectures; Object caching; Object clustering; Object migration, Distributed object base systems	5	12	2,4,5
7	QUERY PROCESSING IN DISTRIBUTED OBJECTBASE SYSTEMS Problems in accessing distributed objects; Distributed object assembly problem; Strategies for distributed object assembly	3	8	4,5
8	TRANSACTION MANAGEMENT The transaction concept; Goals of transaction management, Characteristics of transactions, Taxonomy of transaction models	3	8	3
9	CONCURRENCY CONTROL Concurrency control in centralized database systems; Concurrency control in DDBSs ,Distributed concurrency control algorithms; Deadlock management	3	8	3

10	RELIABILITY Reliability issues in DDBSs; Types of failures; Reliability techniques Commit protocols; Recovery protocols	3	8	5
11	TRANSACTION MANAGEMENT IN DISTRIBUTED OBJECTBASE SYSTEMS Additional demands of objectbase transactions, Transaction model extensions and alternatives, Classification of correctness criteria; Survey of objectbase transaction models	3	8	3
12	OTHER TOPIC Mobile database systems introduction/concept. Note: While teaching the subject and for evaluation the emphasis should be only on making the concepts clear as they do not have any practical for the paper.	3	8	4,5

Reference Books:

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.
5. W. Kim (editor). Modern Database Systems: The Object Model, Interoperability, and Beyond. ACM Press.

	Language generation and Natural Language Systems.			
6.	<p>Expert Systems</p> <p>a. Architecture – Need and Justification of Expert Systems – Knowledge acquisition and validation.</p> <p>b. Perception and Action</p> <p>d. Real time search, perception, action, vision, robot architecture</p> <p>e. Learning in Neural Networks – Applications – Hopfield Networks</p> <p>f. Backpropagation</p> <p>c. Case Study</p> <p>g. XCON, PROSPECTOR</p>	2		1,5
		1		1,2,6
		3		4,7
		2		

Text Books

- a. Introduction to AI and Expert Systems - Patterson.
- b. Artificial Intelligence - Rich E and Knight K
- c. Principles of Artificial Intelligence - Nilsson.

Reference Books

- d. Artificial Intelligence – An Engineering Approach - Schalkoff R J
- e. Introduction to Expert System - Peter Jackson
- f. Artificial Intelligence - Janakiraman

websites

- g. <http://www.computing.surrey.ac.uk/ai/PROFILE/prospector.html#REASONING>

IT E1 : NETWORK SECURITY

Sr. No	Chapter Details	Session	Marks %	Reference
1	Introduction Security Concepts Threats and Risks Attacks – Passive and Active Security Services <ul style="list-style-type: none"> - Confidentiality - Authentication - Non-Repudiation - Integrity - Access Control - Availability Model for Internetwork Security Internet Standards and RFCs	6		1,2,4
2	Access Control Mechanisms <ul style="list-style-type: none"> - Access Matrix - HRU, TAM - ACL and capabilities Access Control Models <ul style="list-style-type: none"> - Chinese Wall - Clark-Wilson - Bell-LaPadula Non-Interference and Role Base Model	4		1,2
3	Cryptography <ul style="list-style-type: none"> - Secret Key and Public Key Cryptosystems <ul style="list-style-type: none"> - Symmetric Ciphers - Block Ciphers and Stream Ciphers <ul style="list-style-type: none"> - DES, IDEA and Key Escrow - RSA and ElGamal - Secure Hash and Key management <ul style="list-style-type: none"> - Digital Signature and Non-repudiation - cryptanalysis 	9		3,5
4	Network Security <ul style="list-style-type: none"> - Objectives and Architectures - Internet Security Protocols - IP encapsulating Security Protocol	4		1,2

	- Network and Transport Layer Security			
5	<ul style="list-style-type: none"> Network Security Applications <ul style="list-style-type: none"> - Authentication Mechanisms <ul style="list-style-type: none"> a. Passwords b. Cryptographic authentication protocols c. Smart Card d. Biometrics e. Digital Signatures and seals f. Kerberos g. X.509 LDAP Directory - Web Security <ul style="list-style-type: none"> a. SSL Encryption b. TLS, SET - E-mail Security <ul style="list-style-type: none"> - PGP's / MIME - IP Security 	10		1,6
6	<ul style="list-style-type: none"> Access and System Security <ul style="list-style-type: none"> - Intruders - Intrusion Detection and Prevention <ul style="list-style-type: none"> - Firewalls <ul style="list-style-type: none"> a. Hardware Firewall b. Software Firewall c. Application Firewall d. Packet Filtering e. Packet Analysis - Proxy Servers <ul style="list-style-type: none"> a. Firewall setting in Proxy b. ACL in Proxy 	7		1,6

References :

- 1 William Stallings, "Network Security Essentials", Prentice-Hall.
- 2 Edward Amoroso, "Fundamentals of Computer Security Technology", Prentice-Hall.
- 3 Dorothy E. Denning, "Cryptography and Data Security", Addison-Wesley.
- 4 Peter J. Denning, "Computers under Attack", Addison-Wesley.
- 5 Douglas R. Stinson, "Cryptography: Theory and Practice", CRC Press.
- 6 D. Brent Chapman and Elizabeth D. Zwicky, "Building Internet Firewalls", O'Reilly and Associates

ITE1-MOBILE COMPUTING

Sr. No	Chapter Details	Session	Marks %	Reference
1	Introduction: Cellular networks, wireless LANs, application adaption administrative	1		1
2	Cellular Overview: Cellular concept, location management, handoffs	2		1
3	Wireless LANs overview: Mac issues, mobile IP, adhoc networks, TCP issues.	4		1
4	Applications Overview: Wireless applications, disconnected operations, data bcasting, mobile agents	3		1
5	GSM: Air-interface, channel structure, timing, architecture	4		2
6	WAP: Architecture, protocol stack, application environment, application demo	3		3
7	TCP: Asymmetric links, wireless errors, handoffs, i-tcp, snoop, link rxmit, m-top	4		4
8	Adhoc Networks: Mac, routing, transport	3		4
9	Routing: Virtual backbone, Kelpi, MobileIP	3		4
10	Sensor Networks: SPIN, distributed computation	1		4
11	Data Broadcasting: Push-pull, consistency	3		2
12	Mobile agents: Design, applications frameworks: Aglets etc. Ajanta	5		2
13	Location Management: HLR-VLR, hierarchical File systems: Bayou	1		2
14	Access Technologies: Blue Tooth, GPRS, 802.11, CDMA	3		3
15	Q0s in Wireless	1		-

Reference

1. Mobile Communications by J. Schiller, Addition Wesley Publication

2. GSM System Engineering by A.Mehrotra, Addition Wesley Publication
3. Understanding WAP by M. Heijden, M. Taylor, Artech House Publication
4. Mobile IP by Charles Perkins, Addition Wesley Publication
5. Adhoc Networks by Charles Perkins, Addition Wesley Publication

ITE1 : VISUAL PROGRAMMING USING C++

Course Objectives

To provide an excellent grounding in the object-oriented and advanced features of the visual programming using visual C language, and to show how those features may be applied.

Sr. No	Chapter Details	Session	Marks %	Reference
Section A : SDK Programming				
1	Introduction to Windows: GUI, Multitasking Environment, Multitasking advantage, Function calls, Message driven architecture, Window procedure, Device independent graphics Interface	2	4	1
2	Creation of first window: New data types, Identifiers, Hungarian notations, Handles, Window function call, Program entry point, C source code file, Window class, Registering the window class, Creating the window, Displaying the window, Message loop, WinProc, Precessing the Message, WM_DESTROY Message, Queued non Queued Messages	3	6	1
3	Painting with Text WM_PAINT Message, Valid invalid rectangle, Device context, Paint information structure, Getting device handle-2 Methods, Textout, Size of client area, Scroll bars.	3	6	1
4	Graphics: GDI Structure, Getting Device context Information, Saving device context, Drawing lines, Using stock pens, Creating, selecting, deleting the pen, Drawing filled Area, Selecting the colors, Rectangle, Regions, Painting the regions	4	8	1
5	Means of Input Keyboard Basics: Keystroke messages, lParam variable, Virtual key codes, Sending messages, WM_CHAR Message, Mouse Basics: Mouse messages, Client area mouse messages, Non client area mouse messages	4	8	1
6	Child Window controls Button class, Creating child window, Checkbox, Radiobuttons, Push buttons, Button focus, Listbox	3	6	1

	class			
7	Using recourses Menus: Menu structure, Menu template, Refernceing the menu, Menu messages, Popup menu, System menu.	3	6	1
Section B: MFC Programming				
8	Introduction to MFC Windows programming model Visual c++ Components What's an Application framework, MFC Library application framework	3	4	2
9	Creation of View What is SDI, MDI Creation of simple view (Window) Cex03aView View class, Drawing inside the view Window device context	3	3	2
10	Event handling Message Map: mouse messages, Mapping modes, Window client area, Using AppWizard, ClassWizard, Scroll bars	2	3	2
11	Graphics Device, Interface, Colors and fonts Device context classes GDI Objects Color mapping, fonts	2	4	2
12	Modal dialog and windows common controls Modal vs Modales dialog Recourses and controls Programming a modal dialog Identifying a control: CWnd pointers and Control ID's Windows common controls Modeless dialog Windows common dialogs	4	6	2
13	Menus, Keyboard accelerator Main frame windows, document classes Windows menu Keyboard accelerator Command processing Built-in Menu items MFC Text editing option CMenu class	4	6	2

Reference:

- 1.Programming Windows 95 by Charles Petzold
- 2.Programming Microsoft Visual C++ by David Kriglinski, George Shepherd, Scot Wingo

Note:Programs taught in SDK, the same should be taught in MFC.

In paper there should be theory questions only on MFC part and from SDK part only the program should be asked, and no need to write WinMain function

ITE1-HUMAN COMPUTER INTERFACE

Sr no	Chapter Details	Sessions	Marks %	References
1	Introduction: Human factors of interactive software, goods of system engineering, user interface design, motivation human factors in design.	3	10	3
2	Principles and Guidelines : Usability paradigms, object action interface principles and rules, guidelines for data entry and display.	4	10	3
3	Design Process: Managing design process,design methodologies, participatory design. Usability and tests, Acceptability tests, Software tools, specification methods.	5	15	1,4
4	Dialog Notation Design : Visual thinking and icons, direct manipulation programming, virtual; environments, item presentation sequence, layout, form fill-in dialog boxes.	5	15	1,4
5	Implementation Support: Individual window design, multiple window design, coordination, image browsing, command organization, command menus, natural languages in compiling, window manages and user interfaces.	5	15	2
6	Interactive Device : Keyboards, Speech recognition , image & video displays, Response time and Display Rate	2	5	1
7	Documentation : Presentation styles, balancing function, error interactions handling, errors, printed manuals, online facilities	3	10	2,3
8	Computer Supported Co-operation: Goals of Co-operation , asynchronous interactions, synchronous distributed , application to education ,and social uses.	2	5	2
9	Information search and Visualization: Database query and phase search in documents , multimedia document searches, information visualization, advanced filtering, hypertext and hypermedia , users and their tasks, object action interface model for website design.	5	15	1,3

References

1. Designing the user interface, Ben shneiderman , Pearson Education Asia.
2. Human Computer interaction ,2/e,Alan J Dix,Janet E. Finlay, G.D. Abowd and Rusell Beale,Prentice Hall.
3. Elements of User interface design,Theo Mandel, JW and Son.
4. Essential Guide To User Interface Design,Willbert Galitz,JW.

ITE1 - PARALLEL COMPUTING

Sr. No	Chapter Details	Session	Marks %	References
1	Processes & Processors. Shared memory. Fork. Join constructs. Basic parallel programming techniques – Loop splitting, spin locks, contention barriers and row conditions.	8	30%	1
2	Variations in splitting, self and Indirect scheduling. Data Dependency – forward and backward block scheduling.	8	25%	1
3	Linear recurrence relations. Backward dependency, Performance tuning overhead with number of processes, effective use of cache.	7	20%	1
4	Parallel programming examples: Average, mean squared deviation, curve fitting, numerical integration. Traveling salesman problem. Gaussian elimination. Discrete event time simulation.	6	25%	1
5	Parallel programming constructs in HPF, Fortran 95. Parallel programming under Unix.	9	20%	1

References: 1. Introduction to parallel programming By Brawer.

ITE1- ADVANCED UNIX

Sr no	Chapter details	Sessions	Marks %	References
1	Introduction to UNIX Evolution of Unix, Features, System structure, File System	3		1,2
2	File I/O System calls for file I/O, File Sharing, Concept of File descriptor duplication, File Control	3		1,2
3	Files and Directories File status, File types, Permission, ownership and related System call. File system, Links, File times Directory related functions	4		1,2
4	Standard I/O Library Streams, Buffering, open, read & write on streams, Binary I/O, Formatted I/O Temporary Files	4		1,2
5	Environment of Unix Process Process invocation and termination, Environment variables & List Memory Layout of C program & memory management routines	3		1,2
6	Process control Process identifiers, system calls related to Multitasking, Race condition Zombie & Orphan process, system	5		1,2
7	Process relationship Sessions, Controlling Terminal, Job Control Sharing data among parent & Child using Files	3		1,2
8	Signals Signal Concepts. Signal handling. Important signals. kill, raise, alarm, pause, and abort	3		1,2
9	Advanced I/O Record Locking , Streams, I/O Multiplexing, Memory Mapped I/O, various Read and write	4		1,2
10	Inter Process Communication Pipes, FIFO, System V IPC (Message Queue, Semaphore, Shared Memory)	5		1,2

References

Advanced Programming in the UNIX environment –W.R.Stevens
The C Odyssey UNIX - Meeta Gandhi

IE1-PROGRAMMING LANGUAGE PARADIGMS

Sr no	Chapter details	Sessions	Marks %	References
1	Language Design Issue 1 Short History 1.1.1 Development of early languages 1.1.2 Evolution of software architecture 2 Role of Programming languages 1.2.1 Attributes of language 1.2.2 Language paradigms 1.2.3 Language standardization 3 Programming Environment 1.3.1 Effects on language design 1.3.2 Environment framework	5	8	A
2	Impact of machine architecture Operation of Computer 2.1.1 Computer Hardware 2.1.2 Firmware Computers 2.1.3 Translator and Virtual Machines	3	6	A
3	Virtual computers & Binding times 2.2.1 Language Implementation 2.2.3 Hierarchies of virtual machines 2.2.3 Binding & Binding times			
	Language Translation Issue 3.1.1 General syntactic Criteria 3.1.2 Syntactic Element of language Stages in translation 3.2.1 Analysis of source program 3.2.2 Synthesis of object program	4	8	A
4	Elementary Data Types 4.1 Properties of types and Object (4.1.1. To 4.1.5) 4.2 Scalar data types (4.2.1 to 4.2.4) 4.3. Composite data types (4.3.1 to 4.3.2)	6	10	A

5	Sequence Control 1 Implicit & Explicit Sequence control 2. Sequencing with Arithmetic Expression 5.2.1 Tree structure representation 5.2.2 Execution time representation	4	10	A
	Sequence control between statements 5.3.1 Basic statements 5.3.2 Structured sequence control			
6	Subprogram Control Subprogram Sequence Control 6.1.1 Simple call return subprograms 6.1.2 Recursive sub program 6.1.3 Examples in C & C++ Attributes Of Data Control 6.2.1 Name & referencing environments 6.2.2 Static and dynamic scope 6.2.3 Block structure 6.2.4 Local data & local referencing Env. Parameter Transmission 6.3.1 Actual and Formal Parameters 6.3.2 Methods for Transmitting Parameters Explicit Common Environments 6.4.1 Dynamic Scope 6.4.2 State Scope and Block Structure	6	10	A
7	Storage Management 7.1 Element requiring storage 7.2 Programmer and system controlled storage 7.3 Static storage management 7.4 Heap storage management	6	10	A
8	8 Language Summaries 8.1 Language summaries of C++ & JAVA	6	8	A

References :

A) Programming Languages by Terrence W. Pratt, Pearson Education Publications

IT51L – ADVANCED INTERNET TECHNOLOGY LAB

Assignments on the concepts like PERL – CGI, ASP, JSP, PHP should be designed for the AIT Lab.

IT 52-L CASE TOOLS LABORATORY

1. Use of diagramming tools for system analysis
 - Preparing Data Flow Diagrams & Entity Relationship Diagrams
2. Use of Tools
 - To design User Interfaces
 - Report generation
(Using VB /Oracle Developer)
3. MS – project
 - Its use in project scheduling
4. Use of any Automated Testing Tools
5. S/W Configuration Management Tools
 - Source Code Control System (SCCS)
 - make in UNIX

Semester VI

**GENERAL INSTRUCTION REGARDING PREPARATION OF
PROJECT REPORT FOR MCA-III SEM-VI**

TYPING

- (a) The typing shall be standard 12 pts in double spaced using black ink only
- (b) Margins must be Left 2 inches Right 1.5 inches
 Top 2 inches Bottom 1.5 inches
- (c) Paper A4 size Bond Paper

COPIES

Two hard-bound copies (Black Rexine with Golden Embossing as per format displayed herewith) One original and one clean Xerox Copy.

FORMAT FOR TITLE PAGE AND FOR EMBOSSING

<p style="text-align: center;">PROJECT REPORT ON</p> <p style="text-align: center;"><i>NAME OF THE SYSTEM</i></p> <p style="text-align: center;"><i>NAME OF THE COMPANY</i></p> <p style="text-align: center;">BY</p> <p style="text-align: center;"><i>NAME OF STUDENT</i></p> <p style="text-align: center;">UNIVERSITY OF PUNE MASTER IN COMPUTER APPLICATION INSTITUTE..... PUNE-4110.. 2008-2009</p>
--

The Guidelines regarding the documentation and scope of project are mentioned here

Project Report should be submitted in following format for Commercial Application Projects viz. Payroll, Sales, Purchase, Inventory, Book Shop, Examination system etc. below:

MCA-III SEM-VI (COMMERCIAL SYSTEM PROJECTS)

Where VB, Access, Oracle, ASP and Java is used.

2 Blank Pages at beginning

Title Page

Certificate from Company

Certificate from Guide

Acknowledgement

Index with printed Page Numbers

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 Existing System and Need for System
- 1.3 Scope of Work
- 1.4 Operating Environment – Hardware and Software

CHAPTER 2 : PROPOSED SYSTEM

- 2.1 Proposed System
- 2.2 Objectives of System
- 2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN

- 3.1 Data Flow Diagram (DFD)
- 3.2 Functional Decomposition Diagram (FDD)
- 3.3 Entity Relationship Diagram (ERD)
- 3.4 Data Dictionary
- 3.5 Table Design
- 3.6 Code Design
- 3.7 Menu Tree
- 3.8 Menu Screens
- 3.9 Input Screens
- 3.10 Report Formats
- 3.11 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL

- 4.1 User Manual
- 4.2 Operations Manual / Menu Explanation
- 4.3 Forms and Report Specifications

Drawbacks and Limitations

Proposed Enhancements

Conclusions

Bibliography

ANNEXURES :

ANNEXURE 1 : INPUT FORMS WITH DATA

ANNEXURE 2 : OUTPUT REPORTS WITH DATA

ANNEXURE 3 : SAMPLE CODE

Project report should be submitted in following format for project using OOAD, Embedded System, WAP and other technologies and Web Deployed Systems where C, C++, J2EE, .NET, OOAD and JAVA, SDK's, API's are used.

2 Blank Pages at the end.

MCA-III SEM VI *** TECHNICAL PROJECTS *****

2 Blank Pages at beginning

Title Page

Certificate from Company

Certificate from Guide

Acknowledgement

Index with printed Page Numbers

CHAPTER 1 : INTRODUCTION

- 1.1 Company Profile
- 1.2 Existing System and Need for System
- 1.3 Scope of Work
- 1.4 Operating Environment – Hardware and Software
- 1.5 Detail Description of Technology Used

CHAPTER 2 : PROPOSED SYSTEM

- 2.1 Proposed System
- 2.2 Objectives of System
- 2.3 User Requirements

CHAPTER 3 : ANALYSIS & DESIGN

- 3.1 Object Diagram
- 3.2 Class Diagram
- 3.3 Use Case Diagrams
- 3.4 Module Hierarchy Diagram
- 3.5 Component Diagram
- 3.6 Deployment Diagram (in case of Web Deployment)
- 3.7 Module Specifications
- 3.8 Interface Diagram (in case of WAP and Embedded Systems)
- 3.9 Web Site Map Diagram (in case of Web Site)
- 3.10 User Interface Design (Screens etc.)
- 3.11 Table specifications (in case back end is a database)
- 3.12 Test Procedures and Implementation

CHAPTER 4 : USER MANUAL

- 4.1 User Manual
- 4.2 Operations Manual / Menu Explanation
- 4.3 Program Specifications / Flow Charts

Drawbacks and Limitations

Proposed Enhancements

Conclusions

Bibliography

ANNEXURES :

ANNEXURE 1 : USER INTERFACE SCREENS

ANNEXURE 2 : OUTPUT REPORTS WITH DATA (if any)

ANNEXURE 3 : SAMPLE PROGRAM CODE (which will prove sufficient development is done by the student) and 2 Blank Pages at the end.