STRUCTURE

FOR

MCA PROGRAMME
UNDER FACULTY OF ENGINEERING

EFFECTIVE FROM JUNE 2008

COURSE STRUCTURE FOR M.CA. (2008 Course) w. e. f. June – 2008

SEMISTER I

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME					
		Lect.	Pr.	Paper		TW	Oral	Pr	Total
				Int	Ext	Int	Ext	Ext	
510901	Problem Solving & Programming in C	4	--	30	70	--	--	---	100
510902	Discrete Mathematics	4	--	30	70	--	--	---	100
510903	Foundations of Information Technology	4	--	30	70	--	--	---	100
510904	Probability & Statistics	4	--	30	70	--	--	---	100
511905	Management Science	4	--	30	70	--	--	---	100
510906	Programming Laboratory	--	4	---	---	50	--	50	100
510907	Information Technology Laboratory	--	4	---	---	50	--	50	100
510908	Soft Skills	--	2	---	---	50	--	--	050
Total of First Term		**20**	**10**	**150**	**350**	**150**	**--**	**100**	**750**

Term work will be assessed continuously during the semester internally by a pair of examiners appointed by the Head of the Institution. Practical/Oral examination will be conducted at the end of semester by a pair of examiners with one internal and one external examiner appointed by the University.

SEMISTER II

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME					
		Lect.	Pr.	Paper		TW	Oral	Pr	Total
				Int	Ext	Int	Ext	Ext	
510909	Object-Oriented Programming	4	--	30	70	--	--	---	100
510910	Data Structures and Files	4	--	30	70	--	--	---	100
510911	Operations Research	4	--	30	70	--	--	---	100
510912	Microprocessor Applications	4	--	30	70	--	--	---	100
510913	Management Information Systems	4	--	30	70	--	--	---	100
510914	Data Structures Laboratory	--	4	---	---	50	--	50	100
510915	Object Oriented Programming Laboratory	--	4	---	---	50	--	50	100
510916	Microprocessor Laboratory	--	2	---	---	50	--	--	050
Total of First Term		**20**	**10**	**150**	**350**	**350**	**--**	**100**	**750**

SEMISTER III

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME					
		Lect	Pr.	Paper		TW	Oral	Pr	Total
				Int	Ext	Int	Ext	Ext	
610901	Operating Systems	4	--	30	70	--	--	---	100
610902	Databases: Concepts & Systems	4	--	30	70	--	--	---	100
610903	Financial Accounting & Management	4	--	30	70	--	--	---	100
610904	Computer Communications & Networks	4	--	30	70	--	--	---	100
611905	Principles of Multimedia	4	--	30	70	--	--	---	100
610906	Software Laboratory I	--	4	---	---	50	50	---	100
610907	Database Laboratory	--	4	---	---	50	--	50	100
610908	Seminar*	--	2#	---	---	50	--	--	050
Total of First Term		**20**	**10**	**150**	**350**	**150**	**50**	**50**	**750**

*Each student will select a topic in the area of Computer Engg./Technology preferably keeping track with recent technological trends and development. The topic must be selected in consultation with the institute guide. Each student will make a seminar presentation in the term making use of audio/visual aids for a duration of 20 – 25 minutes and submit two copies of the seminar report in a prescribed format provided by the host institution duly signed by the guide and Head of the department. Attendance for all seminars for all students is compulsory. Staff members of the institute will assess the seminar internally.

SEMISTER IV

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME					
		Lect.	Pr.	Paper		TW	Oral	Pr	Total
				Int	Ext	Int	Ext	Ext	
610909	System Analysis and Design	4	--	30	70	--	--	---	100
610910	Web Technology	4	--	30	70	--	--	---	100
610911	Object Oriented Analysis & Design	4	--	30	70	--	--	---	100
610912	Java	4	--	30	70	--	--	---	100
610913	Elective I	4	--	30	70	--	--	---	100
610914	Web Programming Laboratory	--	4	---	---	50	50	---	100
610915	Software Laboratory II	--	4	---	---	50	---	50	100
610916	Mini Project**	--	2#	---	---	50	--	--	050
Total of First Term		**20**	**10**	**150**	**350**	**150**	**50**	**50**	**750**

Hours/per/week/Student

** Mini Project is to be carried out in a group of 4 students. Each group will be assigned a guide. At the end of the term the students should submit 2 copies of the report in a prescribed format provided by the institute duly signed by the guide and Head of the Department. Staff members of the institute will assess the mini project internally.

SEMISTER V

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME					
		Lect	Pr.	Paper		TW	Oral	Pr	Total
				Int	Ext	Ext	Ext	Ext	
710901	Software Engineering	4	--	30	70	--	--	---	100
710902	Software Testing	4	--	30	70	--	--	---	100
710903	Advanced Databases	4	--	30	70	--	--	---	100
710904	Principles & Practices of IT Management	4	--	30	70	--	--	---	100
711905	Elective II	4	--	30	70	---	---	---	100
710906	Computer Laboratory	--	4	---	---	50	--	50	100
710907	Elective Laboratory	--	2	---	---	50	50	---	100
710908	Survey & Case Study[1]	--	2	---	---	---	---	---	---
Total of First Term		**20**	**08**	**150**	**350**	**100**	**50**	**50**	**700**

[1] Students should submit the report of the Survey/Case Study in the format prescribed by the host institution and will be duly signed by the guide and the Head of the Department. The term will be granted only after submission of the report.

SEMISTER VI

CODE	SUBJECT	TEACHING SCHEME		EXAMINATION SCHEME				
		Lect.	Pr.	Paper	TW	Oral	Pr	Total
					Ext	Ext		
710909	Comprehensive Viva	---	4*	---	--	100	---	100
710910	Project Work	---	20**	---	250	150	---	400
Total of First Term		**---**	**24**	**---**	**250**	**250**	**---**	**500**

* Hours/per Week/student (Self Study Only)

Comprehensive Viva will be based on questions from any of the subjects taught during semester I to Semester V by a panel consisting of 2-3 examiners with at least one external examiner from industry/academics. 5-6 panels may be formed. Viva will be conducted during 7^{th} to 10^{th} week from the commencement of 6^{th} semester.

** Hours/per/week/Student (For calculating workload: 6 Hrs/week/student)

Project work is to be carried out either individually or in a group. Each group will be assigned a guide. At the end of the term the students should submit at least 2 copies of the project report in a prescribed format. Examination will be carried out by a pair of examiners for each group with one internal and one external examiner appointed by the University.

Elective I

Distributed Systems
Human Computer Interface
ERP
IT Infrastructure management

Elective II

Software Architecture
Artificial Intelligence & Neural Networks
Unix
Design & Analysis of Algorithms

It is resolved to recommend to the Faculty of Engineering to accept the structure, rules and regulations and detailed syllabus for the First year of the Masters in Computer Application (MCA) under faculty of Engineering.

University of Pune
MCA (Under Faculty of Engineering) 2008 Syllabus
Rules, Regulation and General Information

MCA (Part I)	**From Academic Year 2008 – 2009**
MCA (Part II)	**From Academic Year 2009 – 2010**
MCA (Part III)	**From Academic Year 2010 – 2011**

1. The name of the programme shall be Master of Computer Applications (MCA). It is a three-year (six semester) full-time programme.

2. Eligibility for Admission: The eligibility criteria for admission for MCA course will be decided by the Competent authority (Director, Technical Education – Govt. of Maharashtra and/or the AICTE, New Delhi).

3. The details of semester wise number of theory subjects and laboratory subjects, number of hours, minimum and maximum marks for each head of passing are provided in the structure of the programme. Lectures and practical should be conducted as per the scheme of lectures and practical. Specific instructions are provided for some of the subjects such as 'Seminar', 'Mini-project', 'Survey & Case studies', 'Project-work' and 'Comprehensive Viva-voce' also.

4. A Candidate to be eligible for the Degree of MCA will be required to appear for and pass examination as under:

Examination		*Consisting of*
First Year Examination in MCA	(F.Y.)	Part I and Part II
Second Year Examination in MCA	(S.Y.)	Part I and Part II
Third Year Examination in MCA	(T.Y.)	Part I and Part II

No candidate will be permitted to appear for Part I or Part II Examination unless he/she keeps term for that part at a College Affiliated to the University with:

- 75 % Attendance in each head of passing of theory and/or term work or practical as prescribed by the University.
- Satisfactory completion of the term work prescribed for the Part and passing in the term work by securing at least 40 % marks out of the maximum marks prescribed for each term work. The term work shall be assessed internally at F.Y., & S.Y. Term work at T.Y. will be assessed externally. Also the candidate must secure 40% of maximum marks for internal assessment for each Theory head for the Part.

Grant of Term

- A candidate who is granted term for F.Y. Part I will be allowed to keep term for his/her F.Y. Part II Examination even if he /she appears and Fails or does not appear at F.Y. Part I Examination.
- A candidate who is granted term for S.Y. Part I will be allowed to keep term for his/ her S.Y Part II Examination even if he /she appears and Fails or does not appear at S.Y. Part I Examination.
- A candidate who is granted term for T.Y. Part I will be allowed to keep term for his/ her T. Y. Part II Examination even if he /she appears and Fails or does not appear at T.Y. Part I Examination.

5. Evaluation and Examinations

At each part examination,

- Paper
- Practical
- Oral
- Term Work

as prescribed in the subjects, shall each constitute a separate head of passing.

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

For each theory head, 30 marks will be based on internal assessment and 70 marks on external assessment (semester examination). The internal assessment of 30 marks will be based on Class Test (15 marks), quiz, home assignments (10 Marks) and attendance (5 Marks). The internal marks will be communicated to the University at the end of each semester. These marks will be considered for declaration of the results.

For each theory head, Theory examination of 70 marks will be conducted by the University at the end of the semester.

6. In respect of Term Work evaluation at F.Y. and S.Y., target date shall be fixed for the completion of each sheet, job, project, experiment or assignment, as prescribed in the syllabus and the same shall be collected on the target date and assess immediately at an affiliated college by at least one pair of the concerned teachers for the subject appointed by Principal and the marks shall be submitted at the end of each term to Principal of the College. The Principal of the College shall communicate to the University after the end of the each term, the term work marks along with examination seat numbers and names of candidates, duly signed by concerned teaches and countersigned by the concerned Head of Institution. The term work at T.Y. will be assessed externally by a pair of examiners (one internal and one external) appointed by the University.

7. Term work and performance of Practical /Oral Examination shall be assessed on the basis of depth of understanding of principles involved and not on the basis of mere correctness of results or ornamental or color presentation.

8. Every candidate must secure 40% of maximum marks in internal as well as 40% maximum marks in external for each theory head of passing. For each of the term work, Practical and Oral heads the candidate must secure 40% of maximum marks.

9. The class should be awarded to the student on the aggregate marks obtained by him. The award of class shall be as follows:

(A) Aggregate 66 % or more marks	……	First class with Distinction
(B) Aggregate 60 % or more marks But less than 66 %	……	First class
(C) Aggregate 55 % or more marks But less than 60 %	……	Higher Second Class
(D) Aggregate 50 % or more marks But less than 55 %	……	Second Class
(E) Aggregate 40 % or more But less than 50 %	……	Pass Class

10. In case a candidate fails in an examination but desires to appear again thereat,

- He/She may at his/her option claim exemption from appearing in the head/s of passing in which he/she has passed.
- Such exemption, if claimed, shall cover all the heads of passing in which it can be claimed.
- The marks obtained by the candidate in the heads of passing in which he/she claimed exemptions, will be carried over for the subsequent examination.
- Such exemption, if not availed of at the immediately subsequent appearance of the candidate at the examination shall deemed to have lapsed.
- The marks obtained by the candidate for term work, which is separately assessed, will be carried over unless he/she presents fresh term work after rejoining an affiliated college as a regular student in the corresponding part course.

11. The mark sheet issued to each candidate shall indicate aggregate marks of the highest scorer and number of candidates appeared at the Annual/Summer examination.

12. Backlog:

- A student shall be allowed to keep term for the S. Y. course if he/ she has a backlog of not more than 6 Heads of passing in Theory Examination and not more than 3 Heads of passing in practical Examination and or oral examination at F.Y.
- A student shall be allowed to keep term for the T.Y. course if he/she has no backlog of F.Y. and. if he/ she has a backlog of not more than 6 Heads of passing

in Theory Examination and not more than 3 Heads of passing in practical Examination and or oral examination at S.Y.

13. Board of Paper setters/Examiners: For each semester and examination there will be one board of paper setters and examiners for every subject.

14. Medium of Instruction: The medium of instruction will be English.

15. Clarification of Syllabus: It may be necessary to clarify certain aspects regarding the course. The members of syllabus sub-committee of BOS in Computer Engineering should meet at least once in a year to study and clarify the doubts/difficulties faced by the affiliated institutes.

16. Revision of Syllabus: The syllabus should be revised after every three years.

510901: PROBLEM SOLVING AND PROGRAMMING IN C

Teaching Scheme:
Lectures: 4 Hrs/Week

Examination Scheme:
Theory: 70 Marks

Objectives:

1. To develop logical thinking and programming ability.

Unit I **(6 Hrs)**

Introduction:

Notations of Flow Charts and its implementation, Top-Down-step wise refinement, Implementation of algorithms, Program Verification, Efficiency of algorithms, Analysis of algorithm, Basic Algorithms: Exchange of values of two variables, Summation of set of numbers, Factorial Computation, Sine function computation, Generation of Fibbonacci Sequence, Reversing of digits of an integer, Base conversions, Character to Number conversion, Finding Square Root, Factorial, GCD, Generating Prime numbers

Unit II **(6 Hrs)**

C Programming Basics:

Data Types, Variables, Constants, Expressions, Operators, Operator precedence and associativity, Basic Input-Output statements, Control Structures, Simple Programs in C using all the operators and control structures, Functions: Concept of Functions, Parameters, Parameter passing method, Recursion, local and global variables, scope and extent of variables, Writing programs using recursive and non-recursive functions

Unit III

Arrays and Strings: Single and Multi Dimensional arrays – Strings, String manipulations, Writing C programs using Strings

Unit IV **(6 Hrs)**

Pointers: Definition and use of pointers, address operator, pointer variable, pointer arithmetic, arrays of pointers, passing arrays to functions, pointers and functions, constant pointers, pointers to functions.

Dynamic Memory Allocation: Library functions for Dynamic Memory Allocation, Dynamic multi-dimension arrays, Writing C program using Dynamic Memory allocation functions.

Unit V **(6 Hrs)**

Structures: Declaring and using Structures, operations on Structures, arrays of structures, user defined data type, nested structures, “sizeof” operator, pointer to structure, Self referencing structures.

Unions: Difference between Unions and structures, operations on a Union, Scope of a union, Bit fields, Writing C programs using structures and unions,
Bit-wise and shift operators, command-line arguments, using argc, agrv and env variables, Storage classifiers: auto, static, register and external, compiling multi-file programs

Macro Preprocessor: macro definitions, macro with parameters and conditional compiling.

Unit VI **(6 Hrs)**

Files: Introduction, File Structure, File handling functions, File types, Error Handling, Low level file I/O, redirection and piping, Writing C Programs using files with high level and low level I/O and BIOS system calls.

Text Books:

1. Dromy R., "How to solve it by computer", Prentice Hall of India, 81 – 203 – 0388 – 1
2. S. Kochan, "Programming In C", CBS Publishers and Distributors.
3. Jain M., Iyangar S., Jain R., "Numerical Methods for Scientific and Engineering Computations ", 2nd Edition, Wiley Eastern, 1986, ISBN 85226 – 434 – 8

REFERENCE:

1. Schildt H., "The Complete Reference - C", 4th Edition, Tata McGraw-Hill, 2004, ISBN 0 –07 – 041183 – 2
2. Kernigham B., Ritchie D., "The C Programming Language", 2nd Edition, Prentice Hall of India, 1991, ISBN 0 –87692 – 596 – 4
3. Kanetkar Y., "Understanding Pointers in C", 3rd Edition, BPB Publications, 2002, ISBN 81 – 7656 – 358 – 7

510902: DISCRETE MATHEMATICS

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs/Week Theory: 70 Marks

Objectives:

1. To study discrete objects and relationships among them
2. To demonstrate how these concepts can be applied to solve nontrivial real life problems

Unit I (8 Hrs)

Introduction: History of mathematics as related to discrete structure, motivations for discrete structure, Sets: introduction, combination of sets, finite and infinite sets, uncountably infinite sets, mathematical induction, Principle of inclusion/exclusion (addition principle)

Unit II (8 Hrs)

Propositional Calculus: Propositions, logical connectives, truth table, methods of proof using inference rules: equivalence and implications, universal and existential quantifiers, propositional calculus

Unit III (8 Hrs)

Permutations and Combinations: Rules of sum and products, permutations, combinations, generations of permutations and combinations

Unit IV

Relations and Functions: Definitions, properties of binary relation, equivalence relation, partial ordering relations, definition of a function, pigeonhole principle

Unit V (8 Hrs)

Graphs and Planer graphs: Basic terminology, multigraphs and weighted graphs paths and Circuits, shortest path in weighted graphs, Hamiltonaian and Eulerian paths and circuits

Unit VI (8 Hrs)

Trees and cut sets: Trees, rooted trees, path lengths in rooted trees, prefix code, binary search trees, spanning trees and cutsets, minimal spanning trees

Text Books:

1. J. Tremblay, Manohar R., "Discrete Mathematical Structures with application to Computer Science", Tata McGraw-Hill, 2002 ISBN 0-07-463113-6
2. Deo N., "Graph theory with application to Engineering and Computer Science", Prentice Hall of India, 1990, ISBN 0 – 87692 – 145 – 4

Reference Books:

1. LIU C., "Elements of Discrete Mathematics", 2nd Edition, Tata McGraw-Hill, 2002, ISBN 0-07-043476-X.
2. B. Kolman, R. Busby and S. Ross, "Discrete Mathematical Structures", 4th Edition, Pearson Education, 2002, ISBN 81-7808-556-9
3. Johnsonbaugh R., "Discrete Mathematics", 5th Edition, Pearson Education, 2001 ISBN 81 – 7808 – 279 – 9
4. Goodaire E., Parmenter M., "Discrete Mathematics with Graph Theory", 2nd Edition, Pearson Education, 2003 ISBN 81 – 7808 – 827 – 4
5. Biggs N., "Discrete Mathematics", 2nd Edition, Oxford, 2002 ISBN 0 –19 – 850717 - 8

510903: FOUNDATIONS OF INFORMATION TECHNOLOGY

Teaching Scheme: **Examination Scheme:**
Lectures: 3 Hrs/ Week Theory: 70 Marks

Unit I **(8 Hrs)**
Introduction: Characteristics of computer, Evolution and generations of computer, **Basic Computer Organization :**Input and Output Unit, Primary and Secondary storage, CPU: ALU, Control Unit, **Classification of computers:** Notebook, PCs, Workstations, Mainframe, Super computers, Client and server **Number Systems:** Binary, Hex, Octal, Decimal numbers, Floating-point Numbers, **Computer codes:** BCD and EBCDIC codes, ASCII, collating sequence, **Boolean Algebra and Logic circuits:** Boolean algebra, Boolean functions, logic gates, Logic circuits, Design of combinational logic

Unit II **(8 Hrs)**
Processor and Memory: study of CPU and different parts of CPU, Memory and types of memory
Secondary storage devices: Sequential and direct access devices, Magnetic tape, disk, Optical disk, Mass storage, **Input-output Devices**: Study of different Input/Output devices

Unit III **(8 Hrs)**
Computer Software: What is software? Relationship between Software and Hardware, Types, Logical system architecture, Acquiring software, Software development steps, Firmware, **Computer Languages:** Analogy with natural language, machine language, Assembly Language, High-Level language, Object Oriented Programming languages, Study of Some Higher level Languages, characteristics of good program, Languages, Selecting language for coding, subprogram

Unit IV **(8 Hrs)**
Operating Systems (OS): What is an OS? System Performance, Process Management, Memory Management, File management, Security, OS capability enhancement software, some popular OS
Application software packages: Word Processing, Spreadsheets, Graphics, Personal Assistant Package

Unit V **(8 Hrs)**
System Implementation and Operation: Testing and debugging, Documentation, Changeover to new system, System evolution, System maintenance,
Business data processing: What is data processing? Standard methods of organizing data, File management system, Database management system
Multimedia: What is multimedia? Components of multimedia, Applications

Unit VI **(8 Hrs)**
Data communications and Computer Networks: Basic elements, Data transmission modes, speed, Transmission media, digital and analog computers, Communication processors, Asynchronous and Synchronous Transmission, Switching techniques, Routing techniques, Network Technologies, network types, Communication Protocols, Internetworking tools, Wireless networks, Distributed computer systems, **The Internet:** History, Basic services, www, browsers

Reference Books:

1. Sinha P., Sinha P., "Foundation of Computing", BPB Publication, 1st Edition, 2003 ISBN-81-7656-663-2
2. Rajaraman V., "Computer Fundamentals" – ISBN 0B- 87692-387-2

510904: PROBABILITY AND STATISTICS

Teaching Scheme:
Lectures: 4 Hrs/Week

Examination Scheme:
Theory: 70 Marks

Objectives:

- To provide an introduction to probability and statistics

UNIT 1: Introduction

Interpretation of probability, sample space and events, permutations and combinations, permutations of indistinguishable objects, Binomial Theorem, Multinomial Theorem, Axioms of probability, conditional probability, Multiplication Rule, Bayes' Theorem,

UNIT 2: Discrete Distributions

Random Variables, Discrete probability densities, cumulative Distribution, mathematical Expectations, Mean, Variance, Standard Deviation, Moment Generating Function, Geometric Distribution, Binomial Distribution, Negative Binomial Distribution, Hyper Geometric Distribution, Poisson Distribution.

UNIT 3: Continuous Distributions

Continuous Random Variable and Probability Density, Cumulative Distribution, Expected Value, Mean and Variance, Uniform Distribution, Gamma Function, Gamma Distribution, Exponential Distribution, Chi-squared Distribution, Normal Distribution, Standard normal Distribution, Weibull Distribution and reliability, Reliability of series and parallel systems, Joint Distributions, Joint Density and Marginal Density (Discrete and Continuous), Independence, Expectation and Covariance, Correlation, Conditional Densities and Regression.

UNIT 4:

Descriptive Statistics: Random Sampling, Sample Statistics, Location Statistics, measures of Variability.

Estimation: Point Estimation, Methods of moments and maximum likelihood estimation, Functions of random Variables -Distribution of sample mean, Internal Estimation, Confidence Interval on the mean with Variance known, Central Limit Theorem.

UNIT 5:

Interval Estimation of Variability, Estimating the Mean and Student-t Distribution, Hypothesis Testing, Significance Testing, Hypothesis and Significance Tests on the Mean.

Inference on proportions: Estimating proportions ,Confidence interval on p, Sample size for estimating p, Testing Hypothesis on a proportion, Comparing two Proportions-Estimation and Hypothesis Testing

UNIT 6:

Categorical Data: Multinomial Distribution, Chi-squared Goodness of Fit Tests, Testing for independence: r * c Test for Independence, Comparing proportions: r * c Test for homogeneity

Statistical Quality Control: Properties of control charts, Shewhart control charts: Sample Mean chart, R chart, P chart, C charts

Acceptance Sampling, Two-Stage acceptance sampling

Text Books:

1. Trivedi K., "Probability and Statistics with reliability, Queuing, and Computer Science Applications", PHI, ISBN: 81-203-0508-6
2. Spiegel, Schiller, "Probability and Statistics" 2nd Edition, TMH, ISBN: 0-07-058610-1

Reference Books:

1. Papoulis, Pillai, "Probability, Random Variables and Stochastic Processes", 4th Edition, TMH, ISBN: 0-07-048658-1

510905: MANAGEMENT SCIENCE

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs / week Theory: 70 Marks

Objectives:

- To make the student familiar with management concepts

Unit I : Introduction to Management (8 Hrs)
Evolution of Management Science, Contributions of F.W. Taylor, Henry Fayol, Gantt, Gilbreth etc. Definitions of Management, Management as an art, Science and profession, Management, Administration and Organization concepts, Levels of Management, Functions of Management, Management by Objectives (M.B.O.)

Unit II : Managerial Economics (8 Hrs)
Basic Economic concepts: Human needs, Economics Goods, Price, Value, Utility, Wealth, Law of Demand, Law of Supply, Scales of production, internal and external economics of scale, Concepts of E-commerce, E-Business Management, E-Governance, Enterprise Resource Planning (ERP), Intellectual Property laws: Patents, Copyrights, Trademarks Law of Contracts: Salient Features, Role of Chambers of Commerce and Industries

Unit III : Business Organization (8 Hrs)
Forms of Business Organization, Definitions, features, advantages, disadvantages of Individual proprietorship, Partnership, Joint stock Companies, co-operatives and Public Sector Under takings, Types of companies, Formation of Joint stock company, MOA and AOA, Organizational structures, Definition, types, merits and demerits of each of structures (Line, Functional, Line and staff, Committee, Matrix and Project structure)

Unit IV : Human Resource Management (8 Hrs)
Manpower Planning, Factors affecting Manpower Planning, process of manpower planning, Recruitment, selection, training, Job evaluation, Performance Appraisal, wages and incentives, self and time management
Communication: elements, process principles, barriers, listening skills, body language, Media of communication, Communication in Organization (vertical, horizontal etc.) Motivation concept and meaning, Maslows Theory of need hierarchy, Mc Gregors Theory X and theory Y

Unit V : Industrial Act (8 Hrs)
Industrial Act: Introduction, Factory act, Pollution control, Industrial safety: Causes of accidents, Safety, accident prevention, techniques and related legal provisions

Unit VI : Quality Management (8 Hrs)
Quality Management: Concept and importance of quality circles and Total Quality Management (TQM), ISO 9000, Patents, Patent procedure
Note:- Lecturers by experts from industry should be arranged.

Reference Books:

1. Shukla M., “Business Organization and management “, ISBN 81-219-0813 2
2. Aryasri A., “Management Science”, Tata McGraw Hill.
3. Khanna O., “Industrial Management”
4. Koontz H., Weihrich H., “Essentials of Management”, Tata McGraw Hill, ISBN 0-07-035516-9

510906: PROGRAMMING LABORATORY

Teaching Scheme:
Practical: 4 hours/Week

Examination Scheme:
Term Work: 50 Marks
Practical: 50 Marks

Suggested list of assignments

1. Write a program to perform various string operations such as copy, length, reversing, palindrome, concatenation and to find occurrence of a sub-string using and without using library functions
2. Write a program to understand various logical and bit wise operators
3. Write a program to generate permutations and combinations of a given list
4. Write a program to perform various operations such as union and intersection on sets
5. Write a program to perform addition and multiplication operations on matrix. Write functions to determine whether the matrix is symmetric and skewed?
6. Write a program for saddle point or magic square
7. Write a program to compute Inverse of a matrix
8. To create a text file, read it and convert into uppercase and write the contents into another text file by using command line arguments.
9. Write a program to implement a small project to understand the concept of structures, pointers, various operations on files such as create, open, add/ modify/delete/process/append a record, search a record, sort, merge, close.

Note:

1. Proper indenting, coding styles, commenting, naming conventions should be followed.
2. Avoid using global variables as far as possible
3. Use of functions is necessary
4. Faculty should prepare a lab manual including standard test cases and should be available to students for reference

Student should submit term work in the form of a journal consisting of minimum 12 assignments based on the above list. Practical examination will be based on the term work. And questions will be asked during the examination to judge the understanding of the practical performed at the time of examination. Candidate is expected to know the theory involved in the experiment.

510907: INFORMATION TECHNOLOGY LABORATORY

Teaching Scheme:
Practical: 4 Hrs/ Week

Examination Scheme:
Term Work: 50 Marks
Practical: 50 Marks

Assignment No 1:
WINDOWS 98/2000/XP/Linux: Installation**,** Desktop setting - new folder, rename, recycle bin operations, briefcase function, control panel utility, Network setting, Display properties : Screen saver, background settings, Using Command line utilities of Linux/DOS/Windows etc.

Assignment No 2:
Ms - Word: Create a document such as your resume or notes of any topic of your text book using facilities below
Creating file: save, save as, save as HTML, save as Text, template, RTF format, Page setup utility: Margin settings, paper size setting, paper source, layout, Editing: cut, paste, paste special, undo, redo, find, replace, goto etc, View file: Page layout, Normal outline, master document, ruler, header, footer, footnote, full screen, Insert: break, page number, symbol, date and time, auto text, caption file, object, hyperlink, picture etc. Format: font, paragraph, bullets and numbering, borders and shading, change case, columns, Tools: Spelling, merge documents, protect document, mail merge, macro. Table: Draw label, insert table, cell handling, table auto format, sort formula, Give password to document

Assignment No. 3
Ms-PowerPoint: Create any presentation using following facilities
Creating new slide, formatting slide, slide layout, slide show and sorter, Inserting new slide, slide no., date, time, chart, formatting slide, tool operation, Animation, Timing, Inserting Video clips

Assignment No. 4
MS Access: Create a database for Inventory or reservation system or student information system (with multiple tables and relation) and generate different reports
Parts of an Access Window, Tool Bars and Their Icons, Starting Microsoft Access, Creating a New Database, Creating a Database through Table Wizard, Creating a New Table, Rename Columns, Saving the Database, Relationships, Creating Table through Design View, Relationship, Query, Forms, Reports, Import/export tables etc.

Assignment No. 5
Excel Basics: Create small accounting applications such as Maintaining invoices/budgets or totaling of various transactions or Maintaining daily and monthly sales reports or any other application using following facilities of excel
Menus, Opening of Spread Sheet, creation of cells and addressing of cells, Cell inputting, Manipulation of cells, Enter texts numbers and dates, Creation of tables, Cell Height and Widths, Copying of cells, Providing Formulas, Using basic functions/formalism a cell such as Sum, average, Percentage and Other basic functions and draw graphs, import/export

Assignment No. 6
Internet:
A. Creation of New Email Account: Create your own Email account on http://www.hotmail.com / http://yahoo.com or rediff.com and set the account preferences while

registration. Create your signature in hotmail account with following details: 1) Name, 2) Postal Address, 3) Phone, 4) PRN etc.

B. Email with File Attachment: Send an email to your hotmail account with sample image file attachment from your hotmail account. Receive this email and confirm signature appended with it

C. Outlook Express Exercise: Add your email (hotmail) account in 'outlook express' and explore the settings. Create your signature in 'outlook express' with following details: 1) Name, 2) Postal Address, 3) Phone, 4) PRN etc.

D. MSN Messenger/ Yahoo messenger Exercise: Add your account in MSN or yahoo Messenger and add the contacts list to your account on messenger.

E. Search the important information on search engine such as www.google.com/www.altavista.com etc.

F: Create a group on Yahoo groups for your class (set properties)

G: MS Front Page: Introduction, Toolbars, Commands and Their Icons, Starting MS Front Page, Creating a Web Page without a Wizard, Creating a Web Page with a Wizard

Student should submit term work in the form of a journal consisting of minimum 12 assignments based on the above list. Practical examination will be based on the term work. And questions will be asked during the examination to judge the understanding of the practical performed at the time of examination. Candidate is expected to know the theory involved in the experiment.

510908: SOFT SKILLS

Teaching Scheme: **Examination Scheme:**
Practical: 2 Hrs/Week **Term Work: 50 Marks**

Objectives:

1. To encourage the all round development of students by focusing on soft skills
2. To make the students aware about of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration, and practice
3. To develop and nurture the soft skills of the students through individual and group activities
4. To expose students to right attitudinal aspects and to build the same through activities

The coverage of soft skills that help develop a student as a team member, leader, all round professional in the long run have been identified and listed here for references. As the time allotment for the soft skills laboratory is small and the fact that these skills are nurtured over years, students are encouraged to follow up on these skills as self-study and self driven process.

Unit I **(6 Hrs)**
Self Development and Assessment: Self-Assessment, Self-Awareness, Perceptions and Attitudes, Values and Belief Systems, Personal Goal Setting, Career Planning, Self-Esteem, Building of Self Confidence

Unit II **(6 Hrs)**
Verbal and Nonverbal Spoken Communications: Includes planning, preparation, delivery and feedback and assessment of activities like: Public speaking, Group Discussions, Oral Presentation skills, Perfect interview, listening and observation skills, Body Language, Use of presentation graphics, Use of presentation aids, study of Communication Barriers

Unit III **(6 Hrs)**
Written Communications: Technical Writing – Technical reports, Project Proposals, Brochures, Newsletters, Technical Articles, Technical Manuals, Official / Business Correspondence: Business Letters, Memos, Progress Reports, Minutes of Meeting, Event Reporting, Use of Style, Grammar and Vocabulary for effective Technical writing, Use of Tools, Guidelines for technical Writing, Publishing

Unit IV **(6 Hrs)**
Ethics and Etiquettes: Business Ethics, Etiquettes in social as well as office settings, E-mail etiquettes, Telephone Etiquettes, Engineering ethics, and ethics as an IT Professional, Civic Sense

Unit V **(6 Hrs)**
Leadership and Interpersonal Communications: Leaders – their skills, roles, and responsibilities, Vision, Empowering, delegation, motivating others, organizational skills, Problem Solving and conflict management, team building, interpersonal skills. Organizing and conducting meetings, decision making, giving support

Unit VI **(6 Hrs)**
Other Skills – Managing Time, Meditation, Understanding roles of Engineer's and their responsibilities, Exposure to work environment and culture in today's job places, improving

personal memory, Study skills that include Rapid Reading, Notes Taking, Complex problem solving and creativity.

References for students for self-improvement by self-study

Topic 1: Any good book like

1. Shiv Khera, "You Can Win" – Macmillan Books – 2003 Revised Edition,ISBN 0333 93740 6
2. Stephen Covey, "7 Habits of highly effective people "

Topic 2 and 3

1. John Collin, "Perfect Presentation", Video Arts MARSHAL.
2. Jenny Rogers, "Effective Interviews", Video Arts MARSHAL.
3. Raman, Sharma, "Technical Communciations", OXFORD. ISBN 0-19-566804-9
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", Tata McGrawHill ISBN 0-07-044555-9
6. Videos 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 – 040221 – 3

Topic 4 and 5 and 6

1. Tim Hindle, "Reducing Stress", Essential Manager Series DK publishing.
2. Sheila Cameron, "Business students Handbook", Pitman Publishing.
3. Dr R L Bhatia, "Managing Time for a competitive edge".
4. Lorayne, Lucas "Memory Book".
5. Robert Heller, "Effective leadership", Essential Managers DK publishers.
6. Newstrom, Keith Davis, "Organizational Behavior", Tata McGraw Hill.
7. Sasikumar, P Dhamija ,"Spoken English (with video cassettes)" Tata McGraw Hill ISBN 0-07-460358-2

It is proposed that experts from industry be invited to conduct lecturers and work shops to understand the industry soft skill requirements,

LIST OF POSSIBLE ASSIGNMENTS

1. Write a Personal essay and or resume or statement of purpose which may include:
    a. Who am I (family background, past achievements, past activities of significance).
    b. Strengths and weaknesses (how to tackle them) (SWOT analysis).
    c. Personal short-term goals, long-term goals and action plan to achieve them.
    d. Self assessment on soft skills
2. Students could review and present to a group from following ideas:
    a. Book review.
    b. Biographical sketch.
    c. Any topic such as an inspirational story/personal values/beliefs/current topic.
    d. Ethics and etiquettes and social responsibilities as a professional.

3. Students will present to a group from following ideas:
    a. Multimedia based oral presentation on any topic of choice (Business/Technical).
    b. Public speaking exercise in form of debate or elocution on any topic of choice
4. Students will undergo two activities related to verbal/nonverbal skills from following:
    a. Appearing for mock personal interviews.
    b. Participating in Group Discussions on current affairs/social issues/ethics and etiquettes.
    c. Participating in Games, Role Playing exercises to highlight nonverbal skills.
5. Students will submit one written technical documents from following:
    a. Project proposal.
    b. Product brochure.
    c. Literature survey on any one topic.
    d. User manual.
    e. Technical help.
6. Students will submit one written business documents from following:
    a. A representative Official correspondence.
    b. Minutes of meeting.
    c. Work progress report.
7. Students will participate in one or two activities from following:
    a. Team games for team building.
    b. Situational games for Role Playing as leaders, members.
    c. Organizing mock events.
    d. Conducting meetings.
8. Faculty may arrange one or more sessions from following:
    a. Yoga and meditation.
    b. Stress management, relaxation exercises, and fitness exercises.
    c. Time management and personal planning sessions.
    d. Improving memory skills.
    e. Improving leadership skills.
    f. Improving English conversation skills.
    g. Reading comprehension skills and Notes taking skills.

Students are expected to keep a personal record of ANY SIX activities that they undertook in the Soft skills Laboratory in the form of a journal. All students need not do the same assignments. Colleges have a freedom within the framework to customize set of activities to be followed.

Guidelines for Conduction and Assessment of Laboratory Work

1. This laboratory can be seen as a departmental activity with one of the faculty as coordinator.
2. Professionals from HRD departments of companies could assist in training sessions.
3. Certain activities can even be team activities such as technical report submission or joint presentations.
4. Popular science, INTERNET, Magazines, Newspapers, and Training MEDIA from BCL, BBC, Management Institutes, and Management Gurus can also be used as resources.
5. Generally an exercise can be designed to allow multiple skills exposure for example a group task encouraging discussions, team building, value sharing, leadership and Role Play all at the same time.

ASSESMENT Guidelines

1. WRITTEN Communications 20 Marks
   a Students could submit for example
   b Personal resume, essay
   c Technical document or business document.

2. Spoken communications 20 Marks
   a One elocution event of say 8-10 minutes individually
   b One group discussion or group presentation event

3. Overall participation in soft skills based lab activities 10 Marks
   a Attendance and enthusiasm
   b Participation and contribution in event management, organizing
   c Group games, group exercises, interpersonal skills observed.
   d 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)

A Semester allows for 12-14 sessions. Students can do Lot of preparation at leisure 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 one exercise. (2 sessions).
4. Group discussions could be done for groups of 5-8 students at a time for half hour 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)

510909: OBJECT ORIENTED PROGRAMMING

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs/Week Theory: 70 Marks

Unit I : Introduction to Object Oriented Programming (6 Hrs)
Introduction to procedural, modular, object-oriented and generic programming techniques, Limitations of procedural programming, Need of object-oriented programming, fundamentals of object-oriented programming: objects, classes, data members, methods, messages, data encapsulation, data abstraction and information hiding, inheritance, polymorphism.

Unit II : Programming with C++ (6 Hrs)
C++: Extensions to C: Variable declarations, global scope, 'const', reference variables, comments, default parameters, function prototypes, function overloading, inline functions, default and constant arguments, 'cin', 'cout', formatting and I/O manipulators, new and delete operators

Unit III :Classes and Objects (6 Hrs)
Defining a class, data members and methods, public, private and protected members, inline member functions, static data members, static member functions, 'this' pointer, constructors, destructors, friend function, dynamic memory allocation, array of objects, pointers and classes, class as ADTs and code reuse

Unit IV : Operator Overloading (6 Hrs)
Introduction, Need of operator overloading, overloading the assignment, binary and unary operators, overloading using friends, rules for operator overloading, type conversions

Unit V : Inheritance and Polymorphism (6 Hrs)
Concept and need, single inheritance, base and derived classes, friend classes, types of inheritance, hybrid inheritance, member access control, static class, multiple inheritance, ambiguity, virtual base class, polymorphism, virtual functions, pure virtual functions, abstract base class, virtual destructors, early and late binding, container classes

Unit VI : (6 Hrs)
Managing Console I/O Operations: Introduction, C++ streams, stream classes, unformatted I/O, formatted I/O and I/O manipulators
Files and Streams
Concept of a file, file operations, streams, opening and closing a file, detecting end-of-file, file modes, file pointer, structures and files, classes and files, sequential file processing, Error handling

Text Books:

1. Balaguruswamy E., "Object Oriented Programming with C++", Tata McGraw-Hill Publishing Company Ltd, New Delhi ISBN 0 – 07 – 462038 – X.
2. Eckel B., "Thinking in Java", 3rd Edition, Pearson Education, ISBN 81 – 297 – 0524 – 9

Reference Books:

1. Schildt H., "The Complete Reference Java 2", TMH, ISBN 0-07- 049543 - 2
2. Lippman S., "C++ Primer", Pearson Education, 1991, ISBN 0 – 201- 32753- 8
3. Lafore R., "The Waite Group's Object oriented Programming in C++", 3rd Edition, Galgotia Publications, 2001, ISBN 81-7515-269-9.
4. Stroustrup B., "C++ Programming Language", 3rd Edition, Pearson Education, 1997, ISBN 0 – 201 – 32755 – 4.

510910: DATA STRUCTURES AND FILES

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs / week **Theory: 70 Marks**

Objectives:

1. To study the representation, implementation and applications of basic data structures
2. To develop the ability to synthesize and analyze algorithms

Unit I **(8 Hrs)**

Introduction to data structures: Concept of data, Data types, Data Object, Data structure, Abstract Data types (ADT), realization of ADT in C, Linear data structures using sequential organization: Concept of sequential organization, Concept of Linear data structures, arrays as ADT, Multidimensional arrays, Storage representations (row major and column major and their address calculation). Concept of ordered list and polynomial representation using arrays, Representation of sparse matrix using arrays, fast transpose for sparse matrix

Unit II **(8 Hrs)**

Linear data structures using linked organization: Concept of linked organization, singly linked list, doubly linked list, circular linked list, Insertion, deletion and traversal on above data structures. Representation and manipulations of polynomials using linked lists

Unit III **(8 Hrs)**

Stacks and queues: Concept of stack and queues as ADT, Implementation of stacks using sequential and linked organization, linear queue, circular queue using linked and sequential organization, Application of stack for expression conversion, recursion

Unit IV **(8 Hrs)**

Non-linear data structures:

Trees and binary trees-concept and terminology, Data structures for binary trees, Algorithm for tree traversals, Conversion of general tree to binary tree. Binary search trees,

Graphs: Representation of graph - Adjacency matrix and Adjacency list, Graph traversals

Unit V **(8 Hrs)**

Searching and Sorting

Searching: Sequential, binary and Index sequential search, Sorting: General concepts: sort order, sort stability, efficiency and passes, Bubble sort, Quick and Merge sort.

Unit VI **(8 Hrs)**

Files:

Organization of files: sequential and direct access file, hashing function and it's characteristics, collision resolution, linear probing, chaining with and without replacement, rehashing, simple Index file

Text Books:

1. Balagurusamy E., “C and Data Structures”, Tata McGraw-Hill, 2003, ISBN 0 – 07 – 053473 – X
2. Horowitz E., Sahani S., “Fundamentals of Data structures”, PHI
3. Aho A., Hopcroft J., Ulman J., “Data Structures and Algorithms”, Pearson Education, 1998, ISBN-0-201-43578-0

REFERENCES:

1. Langsam Y., Augenstin M., Tannenbaum A., “Data Structures using C and C++”, 2nd Edition, Prentice Hall of India, 2002, ISBN-81-203-1177-9
2. Tremblay J., Soresan P., “An Introduction to Data Structures with Applications”, 2nd edition, Tata McGraw-Hill International Editions, 1984, ISBN-0-07-462471-7
3. Horborn T., “File Concepts”
4. Brassard G., Bratley P., “Fundamental of Algorithms”, PHI, 1999, ISBN 81 – 203 – 1131 – 0

510911: OPERATIONS RESEARCH

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs/Week **Theory: 70 Marks**

Unit I **(6 Hrs)**

Introduction to Linear Programming - Construction of the LP Model - Graphical LP Solution - Computer Solution of LP Models, The Simplex Method: Standard LP Form and its basic solutions -the Simplex Algorithm, Artificial Staring Solution, Special Cases in simplex method application. Duality and Sensitivity Analysis: Definition of the Dual Problem - Relationship between the Optimal, Primal and Dual Solutions, Dual Simplex Method - Primal – Dual Computations, Postoptimal of Sensitivity Analysis

Unit II **(6 Hrs)**

Transportation Model and its variants: Definition of the Transportation Model - Nontraditional Transportation Models-the Transportation Algorithm-the Assignment Model– The Transshipment Model

Unit III **(6 Hrs)**

Network Models: Scope of Network Applications - Network Definitions, Minimal Spanning Tree Algorithm, Shortest Route Problem, Maximal flow model, Minimum cost capacitated flow problem - CPM and PERT

Unit IV **(6 Hrs)**

Goal Programming: Goal Programming Algorithms
Integer Linear Programming: Integer-Programming Solution Algorithms
Forecasting Models: Moving Average technique, Exponential smoothing, regression

Unit V **(6 Hrs)**

Decision Analysis: Decision - Making under certainty - Decision - Making under Risk, Decision under uncertainty.

Unit VI **(6 Hrs)**

Simulation Modeling: Monte Carlo Simulation, Generation of Random Numbers, Method for Gathering Statistical observations

Reference Books:

1. Taha H., “Operations Research: An Introduction", 7th Edition, 2004, ISBN 81-203 – 2235- 5
2. Winston W., “Operations Research”, 3rd Ed.; Windows Lindo Logo, 1997
3. Hillier F., Lieberman G., “Introduction to Operations Research”, 7th Edition, Tata McGraw-Hill, 2001, ISBN 0-07-047387-0

510912: MICROPROCESSOR APPLICATIONS

Teaching Scheme: **Examination Scheme:**
Lectures: 4 Hrs/Week Theory: 70 Marks

Objectives:

- To learn the architecture and assembly language programming of 8085 microprocessor
- To study the peripherals and their interfacing with 8085 microprocessor.
- To provide insight to DOS and BIOS and their functions.

Unit I **(8 Hrs)**

Introduction to 8-bit processor architecture, 8085 microprocessor architecture, Pin Diagram, Functional Block Diagram, Concepts of Tri-state logic, Latches, Buffers and Decoders, 8085 based system with associated latches, buffers, Memory interfacing: Memory Map, Address decoding logic

Unit II **(8 Hrs)**

8085 Programmer's model, 8085 Addressing modes and Instruction set, Machine code and Assembly language programming, Assembler directives, Stacks and subroutines. Timing diagrams: Instruction and machine cycles and wait states

Unit III **(8 Hrs)**

I/0 programming, Memory mapped I/0, I/0 mapped 1/0, Polled I/0, I/0 ports using latches, PPI 8255, Various operating modes of 8255, interfacing, and programming, 4x4 key matrix interfacing, Seven Segment display interfacing

Unit IV **(8 Hrs)**

8085 Interrupt structure, ISR, Introduction to 8253 Timer

Unit V **(8 Hrs)**

Introduction to 16 bit processor - 8086/8088 architecture, minimum and maximum mode, programmers model - Instruction encoding format

Unit VI

Introduction to 8086 assembly language programming. BIOS and DOS calls.

Text Books:

1. Hall D., "Microprocessors and Interfacing", 2nd edition, 1992, McGraw-Hill, ISBN – 0 – 07 – 100462 – 9.
2. Gaonkar R., "Microprocessor Architecture, Programming and Application", 3rd Edition, Penram International, ISBN 0 85226 297 3

Reference Books:

1. Abel P., "Assembly Language Programming", 5th edition, Pearson Education, 2002, ISBN 81 – 203 – 1037 – 3.
2. RayDenkon, "Advanced MS-DOS Programming", 2nd edition, BPB Publications, 2002, ISBN 81 – 7029 – 485 – 1 (Chapters 2, 3, 4, 14).
3. Liu Y., Gibson G., "Microcomputer Systems: The 8086/8088 Family, Architecture, Programming and Design", 2nd Edition, Prentice-Hall of India, 1986, ISBN 0 – 87692 – 409 – 7.
4. Rafiquzzaman M., "Microprocessors – Theory and applications: Intel and Motorola", Revised edition, 2002, Prentice Hall, (Chapters 5, 7, 8) ISBN 81 – 203 – 0848 – 4

510913: MANAGEMENT INFORMATION SYSTEMS

Teaching scheme: **Examination Scheme:**
Lecturers: 4 Hrs/Week **Paper: 70 Marks**

Objectives:

- To learn and understand fundamentals of Information Systems
- To learn and understand architecture, methodology and applications of MIS

Unit I **(8 Hrs)**

Foundations of Information systems and Management: Why Information systems? Components and resources of information systems, Information system activities, Types of information systems: Operations support systems and Management support systems

Management Information Systems: Definition, role and impact of MIS, Introduction to Management, Approaches to Management, Functions of the managers: Management effectiveness, planning, organizing, staffing, coordinating and directing, MIS as a support to the management and a tool for management Process, Organization structure and theory: Organization structure, behavior, organization as a system, MIS: Organization

Strategic Management of Business: Concept of Corporate Planning, Essentiality of strategic planning, development of business strategies, types of strategies, MIS for Business Planning

Infrastructure management: Selection, maintenance of hardware, communication equipments and software as per MIS needs of the organization. Ensure uptime of hardware resources, database management, end user training etc.

Unit II **(8 Hrs)**

Applications of MIS

Manufacturing Sector: Introduction, Personal Management, Marketing Management, Accounting and Finance Management, Production Management, Materials Management and Marketing Management, MIS Applications in Banking and Insurance Sector

Service Sector: Introduction, MIS applications in service industry

Cross-Functional Enterprise Systems: Introduction, Collaboration systems in Manufacturing, Enterprise application Integration, Transaction Processing systems

Implementation Challenges: Integration, implementing IT, End user Resistance and Involvement, Change Management

Unit III **(8 Hrs)**

Enterprise Management Systems: Introduction, Enterprise Resource Planning (ERP) systems: Basic features, benefits, selection, implementation, EMS and MIS

Business Process Re-engineering (BPR): Introduction, Business process, Process and Value stream model of the organization, MIS and BPR

Business Process Outsourcing (BPO): What is BPO? Voice BPO i.e. Call center, non-voice BPO, Scope of BPO, challenges in BPO management etc.

Unit IV **(8 Hrs)**

Customer relationship Management: Introduction, What is CRM? Three phases of CRM, Benefits, challenges and trends in CRM

Supply Chain Management: What is SCM? Role of SCM, Benefits, challenges and trends in SCM

Electronic Commerce Systems: Introduction, scope, B2C, B2B and C2C, Essential e-Commerce processes, Electronic Payment Processes, e-Commerce Applications

Unit V **(8 Hrs)**

Decision support systems: Concept and philosophy, Using Decision Support systems: What-if analysis, sensitivity analysis, Goal-seeking analysis, Optimization analysis, Introduction to Data Warehouse: Architecture, Organization and Management of Data Warehouse, Implementation, Data Mining for Decision support, Executive Information systems, Enterprise Information portal and knowledge management systems, Introduction to Artificial Intelligent systems, Knowledge Based Expert systems and GIS

Unit VI **(8 Hrs)**

Security and Ethical Challenges: Introduction, Ethical responsibility of Business Professionals, Computer crime, Hacking, Cyber Theft, Software Piracy, Privacy issues, Health issues

Security Management: Introduction, Tools, Encryption, firewalls, e-Mail monitoring, biometric security, disaster recovery, fault-tolerant systems, system controls and audits, What is Disaster Recovery? Contingency management and solutions

Global Management of Information Technology: Cultural, political and Geo-economic challenges, global business/it strategies, applications, platforms and Data access issues

Note:- Lecturers by experts from industry should be arranged.

Text Books:

1. O'Brien J., "Management Information Systems: *Managing Information Technology in the Business Enterprise*", 6th Edition, Tata McGraw-Hill Publishing Company Limited, 2004, ISBN 0 – 07 – 058739 – 6
2. Jawadekar W., "Management Information Systems", 2nd Edition, Tata McGraw-Hill Publishing Company Limited, 2002, ISBN 0 – 07 – 044575 – 3

Reference Books:

1. Post G., Anderson D., "Management Information Systems", 3rd Edition, Tata McGraw-Hill Publications, ISBN 0 – 07 – 049940 – 3
2. Gupta U., "Management Information Systems: A Managerial Perspective", Galgotia, ISBN 81 – 7515 – 085 – 8

510914: DATA STRUCTURES LABORATORY

Teaching Scheme:
Practical: 4 Hrs/Week

Examination Scheme:
Term Work: 50 Marks
Practical: 50 Marks

Suggested List of Assignments

1. Represent sparse matrix using array and perform simple transpose, fast transpose and matrix addition.
2. Write a menu driven program to perform following operations on singly linked list: Create, Insert, Delete, Display, Reverse
3. Create two doubly linked lists. Sort them after creation using pointer manipulation. Merge these two lists into one list so that the merged list is in sorted order. (No new node should be created.)
4. Represent polynomial as a circularly linked list and write a menu driven program to perform addition, multiplication and evaluation.
5. Implement stack as an ADT. Use this ADT to perform expression conversion and evaluation. (Infix – Postfix)
6. Implement circular queue using arrays.
7. Implement following sorting methods: Merge sort, Heap sort
8. Create binary tree and perform recursive traversals.
9. Implement binary search tree as an abstract data type.
10. Create binary search tree. Find height of the tree and print leaf nodes. Find mirror image, print original and mirror image using level-wise printing.
11. Represent graph using adjacency list and perform DFS and BFS.
12. File Handling

Note:

1. Proper indenting, coding styles, commenting, naming conventions should be followed.
2. Avoid using global variables as far as possible
3. Use of functions is necessary
4. Faculty should prepare a lab manual including standard test cases and should be available to students for reference

Student should submit term work in the form of a journal consisting of minimum 16 assignments based on the above list. Practical examination will be based on the term work, and questions will be asked during the examination to judge the understanding of the practical performed at the time of examination. Candidate is expected to know the theory involved in the experiment.

510915: OBJECT ORIENTED PROGRAMMING LABORATORY

Teaching Scheme:
Practical: 4 Hrs/Week

Examination Scheme:
Term Work: 50 Marks
Practical: 50 Marks

Suggested List of Assignments

Assignment – 1: Design a Class 'Complex' with data members for real and imaginary part. Provide default and parameterized constructors and member functions to get, set, display, add, subtract, multiply and divide two complex numbers.

Assignment – 2: Design and Implement Class 'String' with a default, parameterized and copy Constructors. Provide member functions to accept and display string and friend function to concatenate and compare two strings without using operator overloading.

Assignment – 3: Design a class "Distance" with kilometers, meters, centimeters as data items. Provide parameterized and copy constructor and overload '+', '-', '*', '<<' and '>>' operators or Design a class "Time" with Hours, minutes and seconds as data members. Provide parameterized and copy constructor and overload '+', '-', '<<' and '>>' operators.

Assignment – 4: Write a class 'Point' with x and y coordinates as data members. Derive two classes 'Line' and 'Circle' from 'Point' with appropriate data members. Derive a class 'Triangle' from class 'Line'. Implement read () and draw () member functions for all the above classes.

Assignment – 5: An organization has to maintain information of employees for calculation of salary. An Employee can be a 'Waged employee' or a 'fixed salaried employee'. A waged employee is paid on hourly basis. A 'Salesperson' is a Waged employee who is paid commission on the sales made.
Design all the above classes and implement member functions to accept the employee details, display employee details and Compute the salary of an employee.

Assignment – 6:
a) Write a template function SWAP () to swap the variables of type int, char and complex.
b) Design template class 'QUEUE' with relevant data members. Implement member functions to add an element and delete an element from queue. Test this class for putting integer and character data items in the queue.

Assignment – 7: Declare class 'STACK' and handle the run time anomalies like Overflow – when the stack is full and Underflow – when the stack is empty. Display error numbers and error message when error is thrown.

Assignment – 8: Write a 'C++' Program to maintain the employee details using files. Implement functions to add a new employee, delete a record of an employee, modify an employee detail and display the details of an employee.

Assignment – 9: A bank maintains three kinds of accounts for customers -- Savings account, fixed deposit account and Current account. The Saving account provides compound interest and withdrawal facilities but no chequebook facility. The fixed deposit account can be Short term, Long term or Medium term. The current account provides chequebook facility but no interest.

Both savings and current account holders should maintain minimum balance and if the balance falls below the minimum balance amount, a service charge is imposed. Design all the classes and provide necessary member functions to deposit and withdraw amount, check for minimum balance and compute and deposit the interest.

Note:

1. Proper indenting, coding styles, commenting, naming conventions should be followed.
2. Avoid using global variables as far as possible
3. Use of functions is necessary
4. Faculty should prepare a lab manual including standard test cases and should be available to students for reference

Student should submit term work in the form of a journal consisting of minimum 14 assignments based on the above list. Practical examination will be based on the term work and questions will be asked during the examination to judge the understanding of the practical performed at the time of examination. Candidate is expected to know the theory involved in the experiment.

510916: MICROPROCESSOR LABORATORY

Teaching Scheme: **Examination Scheme:**
Practical: 2 Hrs/Week **Term Work: 50 Marks**

Suggested List of Experiments

Assembly Language Programming of 8085

1. Arranging the numbers
2. Lookup table for BCD to Seven Segment Conversion etc.
3. Programs using subroutines.
4. Multiplication by shift and add.

Assembly Language Programming of 8086

1. Code conversion.
2. Arithmetic Operations.
3. String Manipulations
4. DOS Interrupt 21H

Interfacing of

1. 8255 Operations in various modes
2. ADC, DAC interfacing.

Staff members will suitably frame assignments. Students will submit the term work in the form of journal with at least 10 assignments.

Guidelines for setting question paper at the First Year Master in Computer Applications (MCA) 2008 course under faculty of Engineering to be effected from the academic year 2008 – 2009

1) Since the syllabi of all the subjects in this curriculum is unitized in SIX units, equal weight age shall be given to all the units with respect to number of questions and allotted marks
2) Each paper shall consists of TWO sections viz. Section A and B. Units I through III shall be under Section A and Units IV through VI shall be under section B.
3) Every unit shall carry TWO questions with internal choice/option offered to the candidate as follows

Section A

Unit – I	Q. 1	OR	Q. 2	MARKS 12/11
Unit – II	Q. 3	OR	Q. 4	MARKS 12/11
Unit – III	Q. 5	OR	Q. 6	MARKS 12/11

Section B

Unit – IV	Q. 7	OR	Q. 8	MARKS 12/11
Unit – V	Q. 9	OR	Q. 10	MARKS 12/11
Unit – VI	Q. 11	OR	Q. 12	MARKS 12/11