RAJEEV GANDHI MEMORIAL
COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS INSTITUTE

Affiliated to JNTU-Anantapur, Approved by AICTE-New Delhi, Accredited by NBA-New Delhi

NANDYAL-518 501, KURNOOL Dist., A.P.

MASTER OF COMPUTER APPLICATIONS

ACADEMIC REGULATIONS,
COURSE STRUCTURE AND SYLLABI

Applicable for students admitted into

M.C.A. (Regular) from 2010-11

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY

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Affiliated to JNTU-Anantapur, Approved by AICTE-New Delhi, Accredited by NBA-New Delhi
NANDYAL-518 501, KURNOOL Dist., A.P.

REGULATIONS

For pursuing Three year Master (post graduate) Degree of study in Computer Applications (MCA), offered by Rajeev Gandhi Memorial College of Engineering and Technology, Nandyal-518501 under Autonomous status and herein referred to as RGMCET (Autonomous)

All the rules specified herein approved by the Academic Council will be in force and applicable to students admitted from the Academic Year 2010-11 onwards. Any reference to "Institute" or "College" in these rules and regulations stands for Rajeev Gandhi Memorial College of Engineering and Technology (Autonomous).

All the rules and regulations, specified here after shall be read as a whole for the purpose of interpretation as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, the Principal, Rajeev Gandhi Memorial College of Engineering and Technology shall be the Chairman, Academic Council.

Academic Regulations 2010 for MCA (Regular)

(Effective for the students admitted into first year from the Academic Year 2010-2011)

The MCA Degree of the Jawaharlal Nehru Technological University, Anantapur, shall be conferred on students who are admitted to the program and fulfil all the requirements for the award of the Degree.

1.0 **Eligibility for Admissions:**

Admission to the above program shall be made subject to the eligibility, qualifications and specialization prescribed by the University from time to time.

Admissions shall be made on the basis of merit rank obtained by the qualifying candidate at ICET examination or on the basis of any other order of merit prescribed by Andhra Pradesh State Council of Higher Education (APSCHE) subject to reservations prescribed by the Govt. of A.P., from time to time.

2.0 **Award of MCA Degree:**

2.1 The student shall be declared eligible for the award of the MCA degree, if he pursues a course of study and completes it successfully for not less than three academic years and not more than six academic years.

2.2 The student, who fails to fulfil all the academic requirements for the award of the degree within six academic years from the year of his admission, shall forfeit his seat in MCA course.

2.3 The minimum clear instruction days for semester shall be 95.

3.0 **Attendance:**

3.1 The student shall be deemed to have eligibility to write End Semester examinations if he has secured a minimum of 75% of attendance in aggregate of all the subjects.

3.2 Condonation of shortage of attendance up to 10% i.e. 65% and above, and below 75% may be given by the College academic committee.

3.3 Condonation of shortage of attendance shall be granted only on genuine and valid reasons on representation by the student with supporting evidence.

3.4 **Shortage of attendance below 65% shall in no case be condoned.**

3.5 The student shall not be promoted to the next semester unless he fulfils the attendance requirements of the previous semester.

Table 1: Credits

	Semester		MARKS	
	Periods / Week	Credits	Internals	Externals
Theory	04	04	40	60
Practical	03	02	40	60
Miniproject		02	25	50
Comprehensive Viva-voce		04	----	100
Project		12	-----	----

Table: 2 Course pattern

Year	Semester	No.of Subjects	Number of Labs	Total credits	
I	1	05	03	5X4=20 3X2=06	26
	2	05	03	5X4=20 3X2=06	26
II	3	05	03	5X4=20 3X2=06	26
	4	05	03	5X4=20 3X2=06	26
III	5	05 Mini project Comprehensive Viva	02	5X4=20 2X2=04 1X2=02 1X4=04	30
	6	Project work		12X1=12	12
Total credits					146

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4.0   **Evaluation:**

The performance of the candidate in each semester shall be evaluated subject-wise, with a maximum of 100 marks for theory and 100 marks for practical, on the basis of Internal Evaluation and End Examination

4.1   For the theory subjects 60 marks will be for the External End Examination. While 40 marks will be for Internal Evaluation, based on the better of the marks secured in the two Mid Term-Examinations held, one in the middle of the Semester (I-IV units) and another immediately After the completion of instruction(V-VIII) units with four questions to be answered out of six, evaluated for 40 marks. Each question carries 10 marks. Each midterm examination shall be conducted for duration of 120 minutes. The End Examination will have 08 questions and 5 questions are to be answered and each question carries 12 marks.

4.2   For practical subjects, 60 marks shall be for the End Semester Examinations and 40 marks shall be for Internal evaluation based on the day-to-day performance. Laboratory examination for MCA course must be conducted with two Examiners, one of them being Laboratory Class Teacher and external Examiner will be from other institute.

4.3   Student has to undergo a comprehensive viva pertaining to his specialization which carries 100 marks. He has to secure 50% marks to obtain required credits. Comprehensive viva will be held at the end of IV semester by a board consist of HOD, senior faculty member and external Examiner from outside the institute. For this, HOD of the Department shall submit a panel of 5 Examiners, who are eminent in that field. One from the panel will be selected by the principal of the institute as external Examiner for comprehensive viva.

4.4   The candidate shall be deemed to have secured the minimum academic requirement in a subject if he secures a minimum of 40% of marks in the End Examination and a minimum aggregate of 50% of the total marks in the End Examination and Internal Evaluation taken together.

4.5   In case the candidate does not secure the minimum academic requirement in any subject(as specified in 4.4.) he has to reappear for the Semester Examination either supplementary or regular in that subject, or repeat the course when next offered or do any other specified subject as may be required.

4.6   The candidate shall be allowed to submit the project report only after fulfilling the academic requirements of all the semesters. The viva voce   examination shall be conducted at the end of the course work and After the completion of the end semester examination of the final semester. The candidate is eligible to submit and appear for project work if and only if he completes / clears all the subjects.

4.7   **Re-registration for Improvement of Internal marks:**

Following are the conditions to avail the benefit of improvement of Internal marks.

4.8   The candidate should have completed the course work and obtained examinations results for I & II semesters.

4.9   He should have passed all the subjects for which the Internal marks secured are more than 50%.

4.10   Out of the subjects the candidate has failed in the examination due to Internal marks secured being less than 50%, the candidate shall be given one chance for each Theory subject and for a maximum of three Theory subjects for Improvement of Internal marks.

4.11   The candidate has to re-register for the chosen subjects and fulfil the academic requirements.

4.12   For each subject, the candidate has to pay a fee equivalent to one third of the semester tuition fee and the amount is to be remitted in the form of D.D. in favour of the Principal, RGMCET payable at RGMCET Nandyal branch along with the requisition through the HOD of the respective Department.

4.13   In case of availing the Improvement of Internal marks, the Internal marks as well as the End Examinations marks secured in the previous attempt(s) for the reregistered subjects stand cancelled.

5.0   **Evaluation of Project / Dissertation work:**

Every candidate shall be required to submit thesis or dissertation after taking up a topic approved by the Department.

5.1   Registration of Project work: The candidate is permitted to register for the project work after satisfying the attendance requirement of all the courses (theory and   practical courses of I to V semester)

5.2   An Internal Department Committee (I.D.C) consisting of HOD, Supervisor and One Internal senior expert shall monitor the progress of the project work. The project work carries no marks.

5.3   The work on the project shall be initiated in the beginning of 6th semester and continue throughout the semester. The duration of the project is for one semester. The candidate can submit Project thesis with the approval of I.D.C. at the end of 6th semester.

5.4   The student must submit status report at least in two different phases during the   project work period. These reports must be approved by the I.D.C before submission of the Project Report.

5.5   The candidate shall be allowed to submit the thesis / dissertation only after passing in   all the prescribed subjects (both theory and practical) and then take viva voce examination of the project. The viva voce   examination may be conducted once in two months for all the candidates submitted during that period.

5.6   Three copies of the Thesis / Dissertation certified in the prescribed form by the supervisor & HOD shall be submitted to the institute.

5.7   The Department shall submit a panel of three experts for a maximum of 5 students at a time. However, the thesis / dissertation will be adjudicated by the board consists of HOD, concerned

supervisor and one external Examiner from other institute nominated by the principal from a panel of Examiners submitted by the Department to the Controller of Examination.

5.8   If the report of the board is favourable viva voce examination, the board shall jointly report candidates work as:

          1.   Satisfactory

          2.   Not satisfactory

If the report of the viva voce is not satisfactory the candidate will retake the viva voce examination after three months. If he fails to get a satisfactory report at the second viva voce examination he will not be eligible for the award of the degree unless the candidate is permitted to revise and resubmit the thesis.

6.0   **Award of Degree and class:**

After the student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of MCA Degree he shall be placed in one of the following classes:

Table: 3 Award of Class

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured form 146 Credits.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	

(The marks in Internal evaluation and End Examination shall be shown separately in the marks memorandum)

7.0   **Supplementary Examinations:**

Apart from the regular End Examinations the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such of the students writing supplementary examinations as supplementary candidates may have to write more than one examination per day.

8.0   **Transcripts:**

After successful completion of the total course of study a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee and also as per norms in vogue.

9.0   **Minimum Instruction Days:**

The minimum instruction days for each semester shall be 95 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

10.0 Amendment of Regulations:

The college may, from time to time, revise, amend or change the regulations, scheme of examinations and syllabi. However the academic regulations of any student will be same throughout the course of study in which the student has been admitted.

11.0 Transfers

There shall be no branch transfers After the completion of admission process.

12.0 With holding of results:

If the candidate has not paid any dues to the institute or if any case of in-discipline is pending against him, the result of the candidate will be with held and he will not be allowed for the next semester. The issue of the degree is liable to be withheld in such cases.

13.0 Transitory Regulations:

Candidate who have discontinued or have been detained for want of attendance are eligible for admission to the same or equivalent subjects as and when subjects are offered, subject to 4.4 and 2.0

14.0 Rules of Discipline:

14.1 Any attempt by any student to influence the teachers, Examiners, faculty and staff of controller of Examination for undue favours in the exams, and bribing them either for marks or attendance will be treated as malpractice cases and the student can be debarred from the college.

14.2 When the student absents himself, he is treated as to have appeared and obtained zero marks in that subject(s) and grading is done accordingly.

14.3 When the performance of the student in any subject(s) is cancelled as a punishment for indiscipline, he is awarded zero marks in that subject(s).

14.4 When The student's answer book is confiscated for any kind of attempted or suspected malpractice the decision of the Examiner is final.

15.0 General:

15.1 The Academic Regulation should be read as a whole for the purpose of any interpretation.

15.2 In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the College Academic Council is final.

15.3 The Institute may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the Institute.

15.4 Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY, NANDYAL

AUTONOMOUS

MASTER OF COMPUTER APPLICATIONS

I YEAR MCA I-SEMESTER

COURSE STRUCTURE

Code	Subject	Theory	Practical	Credits	Scheme of Examination		
					Internal Marks	External Marks	Total Marks
F0001101	Probability and Statistics	4	-	4	40	60	100
F0002101	English Language Communication Skills	4	-	4	40	60	100
F0003101	Accounting and Financial Management	4	-	4	40	60	100
F0004101	Mathematical Foundations of Computer Science	4	-	4	40	60	100
F0005101	Data Structures	4	-	4	40	60	100
F0006101	Data Structures through C-lab	-	3	2	40	60	100
F0007101	IT Workshop	-	3	2	40	60	100
F0008101	English Language Communication Lab	-	3	2	40	60	100
Total		**20**	**9**	**26**	**320**	**480**	**800**

I YEAR MCA II-SEMESTER

Code	Subject	Theory	Practical	Credits	Scheme of Examination		
					Internal Marks	External Marks	Total Marks
F0009102	Organization Structure and Personnel Management	4	-	4	40	60	100
F0010102	Object Oriented Programming	4	-	4	40	60	100
F0011102	Computer Organization	4	-	4	40	60	100
F0012102	Operating Systems	4	-	4	40	60	100
F0013102	Operations Research	4	-	4	40	60	100
F0014102	Programming in C++ lab	-	3	2	40	60	100
F0015102	Computer Organization Lab	-	3	2	40	60	100
F0016102	Operating Systems Lab	-	3	2	40	60	100
Total		**20**	**9**	**26**	**320**	**480**	**800**

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY, NANDYAL
AUTONOMOUS
MASTER OF COMPUTER APPLICATIONS
II YEAR MCA I-SEMESTER
COURSE STRUCTURE

Code	Subject	Theory	Practical	Credits	Scheme of Examination		
					Internal Marks	External Marks	Total Marks
F0017103	Unix and Shell Programming	4	-	4	40	60	100
F0018103	Software Engineering	4	-	4	40	60	100
F0019103	Database Management Systems	4	-	4	40	60	100
F0020103	Computer Networks	4	-	4	40	60	100
F0021103	OOPs through Java	4	-	4	40	60	100
F0022103	Unix and Shell Programming Lab	-	3	2	40	60	100
F0023103	Database Management Systems Lab	-	3	2	40	60	100
F0024103	Object Oriented Programming Lab	-	3	2	40	60	100
	Total	**20**	**9**	**26**	**320**	**480**	**800**

II YEAR MCA II-SEMESTER

Code	Subject	Theory	Practical	Credits	Scheme of Examination		
					Internal Marks	External Marks	Total Marks
F0025104	Data Ware housing and Data Mining	4	-	4	40	60	100
F0026104	Linux Programming	4	-	4	40	60	100
F0027104	Web Technologies	4	-	4	40	60	100
	ELECTIVE-I	4	-	4	40	60	100
F0028104	Embedded Systems						
F0029104	Computer Graphics						
F0030104	Information Security						
	ELECTIVE-II	4	-	4	40	60	100
F0031104	Distributed Databases						
F0032104	Artificial Intelligence						
F0033104	Advanced Computer Architecture						
F0034104	Data Ware housing and Data mining Lab	-	3	2	40	60	100
F0035104	Linux Programming Lab	-	3	2	40	60	100
F0036104	Web Technologies Lab	-	3	2	40	60	100
	Total	**20**	**9**	**26**	**320**	**480**	**800**

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RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING & TECHNOLOGY, NANDYAL

AUTONOMOUS

MASTER OF COMPUTER APPLICATIONS

III YEAR MCA I-SEMESTER

COURSE STRUCTURE

Code	Subject	Theory	Practical	Credits	Scheme of Examination		
					Internal Marks	External Marks	Total Marks
F0037105	Network Programming	4	-	4	40	60	100
F0038105	Object Oriented Analysis and Design Using UML	4	-	4	40	60	100
F0039105	Software Testing Methodologies	4	-	4	40	60	100
	ELECTIVE-III	4	-	4	40	60	100
F0040105	E-Commerce						
F0041105	Multimedia & Application Development						
F0042105	Image Processing						
	ELECTIVE-IV	4	-	4	40	60	100
F0043105	Software Project Management						
F0044105	Middleware Technologies						
F0045105	Cloud Computing						
F0046105	Network Programming Lab	-	3	2	40	60	100
F0047105	Case Tools Lab	-	3	2	40	60	100
F0048105	Mini Project	-	3	2	40	60	100
F0049105	Comprehensive Viva	-		4		100	100
	Total	**20**	**9**	**30**	**320**	**580**	**900**

III YEAR MCA II-SEMESTER

Code	Subject	Credits	Internal Marks	External Marks	Total
F0050106	Project work	12	-	-	-

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I Year MCA - I Sem
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(F000110) PROBABILITY AND STATISTICS

UNIT –I
Probability: Sample Space and events-probability-The axioms of probability-Some Elementary theorems-Conditional probability-Baye's theorem.

UNIT- II
Random variables: Discrete and continuous –Distribution –Distribution function.

UNIT – III
Distribution: Binomial, Poisson and Normal distribution – related properties.

UNIT- IV
Sampling Distribution: Populations and samples-Sampling distributions of mean (known and unknown) proportions, sums and differences.

UNIT –V
Estimation: Point estimation-interval estimation-Bayesian estimation

UNIT- VI
Test of hypothesis: Means and proportions-Hypothesis concerning one and two means-Type I and Type II errors. One -tail, two -tail tests.

UNIT – VII
Tests of significance: Student's t-test, F-test, χ2 – test, Estimation of proportion.

UNIT-VIII
Curve fitting: The method of least squares – Interfaces based on the least squares estimations – Curvilinear regression – multiple regressions- correlation for univariate and bivariate distributions.

TEXT BOOKS:
1. Probability and statistics for MCA, T.K.V.Iyengar, B.krishna Gandhi, S.Ranganathan, M.V.S.S.N.Prasad, S.Chand and Company Ltd.
2. Mathematical Statistics, Gupta, Kapoor , S.Chand.

REFERENCES:
1. Probability and Its Applications, Murray R Spiegel,Schaum Series,TMH
2. Engineering Mathematics, B.V.Ramana, TMH., 2002,
3. Introduction to probability and statistics, J.S.Milton, Jesse C.Arnold, 4/e, TMH.

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AUTONOMOUS

I Year MCA - I Sem

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(F0002101) ENGLISH LANGUAGE COMMUNICATION SKILLS

UNIT –I: Vocabulary building-Synonyms and Antonyms, Word roots, One-word substitutes, Prefixes and Suffixes, Idioms and phrases

UNIT-II: Informal conversation Vs Formal expression - Verbal and non-verbal communication, barriers to effective communication – kinesics

UNIT-III: Types of Communication - Oral, aural, Writing and reading - Word-Power - Jargons - rate of speech, pitch, tone - Clarity of voice

UNIT-IV: Technical presentations - types of presentation –video conferencing-- participation in meetings - chairing sessions.

UNIT-V: Formal and informal interviews – Pre-interviewing planning - ambiance and polemics - interviewing in different settings and for different purposes e.g., eliciting and giving information, interview through tele and video conferencing, recruiting, performance appraisal

UNIT-VI: Written communication - differences between spoken and written communication - features of effective writing such "as clarity, brevity, appropriate tone clarity, balance etc.- GRE, TOEFL models

UNIT–VII: Letter-writing - business letters – pro forma culture - format - style – effectiveness, promptness - Analysis of sample letters collected from industry - email, fax.

UNIT–VIII: Technical Report writing - Business and Technical Reports – Types of reports - progress reports, routine reports - Annual reports - formats - Analysis of sample reports from industry - Synopsis and thesis writing

REFERENCE BOOKS:
1. Effective Technical Communication, M Ashraf Rizvi, Tata Mc.Graw-Hill Pub. company Ltd.
2. Basic Communication Skills for Technology, Andrea J. Rutherford: Pearson Education Asia, New Delhi.
3. GRE and TOEFL; Kaplan and Baron's English in Mind, Herbert Puchta and Jeff Stranks, Cambridge
4. Technical Communication by Meenakshi Raman and Sangeeta sharma, Oxford University Press.
5. Communication Skills, Lenne Sen, Prentice –Hall of India Pvt. Ltd., New Delhi.
6. Communicating at work, Ronald B. Adler, Seanne Marquardt Elmhurst ,Mc Graw Hill international editions.

I Year MCA - I Sem

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(F0003101) ACCOUNTING AND FINANCIAL MANAGEMENT

UNIT I:
Introduction to Accounting: Principles, concepts and conventions, double entry system of accounting, classification of accounts and debit-credit rules.

UNIT II:
Financial Statements: Introduction to basic books of accounts, journal and ledger – trial balance – preparation of final accounts: trading account, profit and loss account and balance sheet.

UNIT III:
Introduction to Financial Management: Meaning and scope, role of financial manager, objectives of time value of money – goals of financial management, leverages: operation, financial leverage and combined leverage.

UNIT IV:
Capital Structure: Cost of capital: cost of equity, preference shares, bonds – weighted average cost of capital – capital gearing – overcapitalization and undercapitalization, sources of finance.

UNIT V:
Financial Analysis through ratios: Ratio Analysis – classification of ratios – short term solvency and long term solvency – profitability ratios – analysis and interpretation of financial statements through ratios of liquidity, solvency and profitability.

UNIT VI:
Funds Flow and Cash Flow Analysis: Meaning, Importance, statement of changes in working capital, statement of sources and application of funds. Cash flow analysis: cash flow statements: preparation, analysis and interpretation.

UNIT VII:
Break Even Analysis: Concept of Break Even Point, Cost-Volume-Profit Analysis, Determination of Break Even Point, Margin of Safety and P/V ratio, Impact of changes in cost or selling price on BEP, Practical applications of Break Even Analysis.

UNIT VIII:
Capital Budgeting: Capital and its significance, types of capital, estimation of fixed and working capital requirements, methods and sources of raising capital. Capital budgeting: features, proposals, methods of capital budgeting, payback method, accounting rate of return (AAR), Net Present Value Method(NPV) and Internal Rate of Return (IRR) -simple problems.

TEXT BOOKS :
1. Financial Accounting, S.N.Maheshwari, Sultan Chand, 2009.
2. Financial Management and Policy, Van Horne, James,C., Pearson ,2009.

REFERENCES:
1. Financial Accounting, Tulsian, S Chand, 2009.
2. Financial Statement Analysis, Khan and Jain, PHI, 2009
3. Financial Management, I.M.Pandey, Vikas Publications
4. Financial Management, Bhat Sundhindra, Excel: 2009
5. Financial Management, Prasanna Chandra, T.M.H, 2009.

I Year MCA - I Sem

	T	C
	4	4

(F0004101) MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

UNIT-I
Mathematical Logic: Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers

UNIT-II
Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT-III
Relations: Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function, Composition of functions, recursive Functions, Lattice and its Properties,

UNIT-IV
Algebraic structures: Algebraic systems examples and general properties, Semi groups and monads, groups, sub groups homomorphism, Isomorphism.

UNIT-V
Elementary Combinatorics: Basis of counting, Enumerating Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application

UNIT-VI
Recurrence Relation: Generating Functions & Sequences , Calculating Coefficient of generating function, Recurrence relations, Solving Recurrence relation by substitution and Generating functions. Characteristic roots, solution of Inhomogeneous Recurrence Relation.

UNIT-VII
Graph Theory: Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs

UNIT-VIII
Graph Theory Applications: Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers

TEXT BOOKS:
1. Elements of Discrete Mathematics- A Computer Oriented Approach,C.L.Liu, D.P. Mohapatra, 3/e,TMH.
2. Discrete Mathematics for Computer Scientists & Mathematicians, 2/e, J.L.Mott, A. Kandel, T.P. Baker, PHI
3. Discrete Mathematical Structures with Application to Computer Science, Tremblay, Manohar McGraw Hill Publication

REFERENCE:
1. Discrete and Combinatorial Mathematics- An Applied Introduction,Ralph. P.Grimaldi,5/e, Pearson Education.
2. Discrete Mathematics and its applications, 6th edition, K.H.Rosen, TMH.
3. Discrete Mathematical Structures, Mallik and Sen, Cengage Learning.
4. Discrete Mathematical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/ Pearson Education.
5. Discrete Mathematics with Applications,Thomas Koshy,Elsevier.
6. Discrete Mathematics, Lovasz, Springer.

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AUTONOMOUS

I Year MCA - I Sem

T   C
4   4

(F0005101) DATA STRUCTURES

UNIT – I
Overview of C, Functions, Arrays, Pointers, Strings, Derived types, Input and Output, Concepts and Classification of Data Structures.

UNIT - II
Linked list: Definition, Single linked lists, Doubly linked lists, Circular linked lists, Circular Double linked lists, Applications of Linked list: Sparse Matrix Manipulation, Polynomial Representation

UNIT – III
Stacks: Introduction, Definition, Representation of Stacks- Arrays and Linked lists, Operations on stacks, Applications of stacks-Evaluation of Arithmetic Expression, Implementation of Recursion, Factorial Calculations, Towers of Hanoi.

UNIT - IV
Queues: Introduction, Definition, Representation of Queues- Arrays and Linked lists, Various Queue structures, Operations on Queues, Applications, Priority queues.

UNIT - V
Sorting: Bubble Sort, Selection Sort, Insertion Sort, Merge Sort, Radix Sort and Quick Sort

UNIT - VI
Searching : Linear Search, Binary Search, and Fibonacci Search.
Tables: Rectangular, Inverted Tables, Hashing Techniques.

UNIT - VII
Tress: Binary Tree, Binary Search Tree (BST), Representation and operations on BST, Recursive and Non-Recursive Tree Traversal Techniques: In order, post order, pre order and applications.

UNIT – VIII
Special Binary Trees: Height Balanced Trees, Heaps, Heap Sort, B-Trees, Threaded Binary Trees, Advantages of Special Trees

TEXT BOOKS:
1. Programming in C and Data Structures, J.R. Hanly, Ashok N. Kamthane, A. Ananda Rao, Pearson Education.
2. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
3. An Introduction to Data Structures With Applications, Trembley, Sorenson, 2/e, TMH.

REFERENCES :
1. Programming in C – Stephen G. Kochan, III Edition, Pearson Eductaion.
2. Samanta,"Classic Data Structures", 1/e, 2001, PHI.
3. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
4. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.

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I Year MCA - I Sem

        P   C
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(F0006101) DATA STRUCTURES THROUGH C - LAB

Objectives:
- To make the student learn a programming language.
- To teach the student to write programs in C to solve typical problems.
- To introduce the student to simple linear data structures such as lists, stacks, queues.

Recommended Systems/Software Requirements:
- Intel based desktop PC   with   ANSI C Compiler and Supporting Editors

Exercise l.

a) Write a C program to find the sum of individual digits of a positive integer.

b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

c) Write a C program to generate all the prime numbers between 1 and n, where value of n is supplied.

Exercise 2.
a) Write a C program to calculate the following Sum:
Sum$=1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$
b) Write a C program to find the roots of a quadratic equation.
c) Write C program that uses both recursive and non-recursive functions
      i) To find the factorial of a given integer.
      ii) To find the GCD (greatest common divisor) of two given integers.
      iii) To solve Towers of Hanoi problem.

Exercise 3
a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C program that uses functions to perform the following:
      i) Addition of Two Matrices ii) Multiplication of Two Matrices
c) Write a C program that uses functions to perform the following operations:
      i) To insert a sub-string in to a given main string from a given position.
      ii) To delete n Characters from a given position in a given string.
d) Write a C program to determine if the given string is a palindrome or not

Exercise 4
a) Write a C program that displays the position or index in the string S where the string T begins, or − 1 if S doesn't contain T.
b) Write a C program to count the lines, words and characters in a given text.
c) Write a C program to generate Pascal's triangle.
d) Write a C program to construct a pyramid of numbers.

Exercise 5
a) Write a C program which copies one file to another.
b) Write a C program to reverse the first n characters in a file.
  (Note: The file name and n are specified on the command line.)
c) Write a C programme to display the contents of a file.
d) Write a C programme to merge two files into a third file (i.e., the contents of the first file followed by those of the second are put in the third file)

Exercise 6
Write a C program that uses functions to perform the following operations.:
      i) Creation   ii) Insertion   iii) Deletion   iv) Traversal on
      a) singly linked list   **b)** doubly linked list   **c)** circular linked list

Exercise 7
a) Write C programs that implement stack (its operations) using
      i) Arrays   ii) Pointers
b) Write C programs that implement Queue (its operations) using
      i) Arrays   ii) Pointers

Exercise 8
Write a C program that uses Stack operations to perform the following:
      i) Converting infix expression into postfix expression
      ii) Evaluating the postfix expression

Exercise 9
Write a C program that implements the following sorting methods to sort a given list of integers in ascending order
      i) Bubble sort
      ii) Selection sort

Exercise 10
Write C program that implements the following sorting method to sort a given list of integers in ascending order:
      i)Quick sort
      ii)Merge sort

Exercise 11
Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers :
      i) Linear search   ii) Binary search

Exercise 12
Write C programs to implement the Lagrange interpolation and Newton- Gregory forward interpolation.
Write C programs to implement the linear regression and polynomial regression algorithms.

Exercise 13
Write C programs to create BST and perform operations on it.
Write C programs to implement recursive and non recursive Tree traversal techniques.

Exercise 14
Write C programs to implement Trapezoidal and Simpson methods.
Write C programs to implement Heap Sort.

REFERENCES:
1. The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
2. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
3. Computer Basics and C Programming, V. Rajaraman, PHI Publications

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(F0007101) IT WORKSHOP

Objectives:
The IT Workshop for engineers is a training lab course spread over 40 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows , Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. **The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.**
Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations. (**Recommended to use Microsoft office 2007 in place of MS Office 2003)**

PC Hardware

Exercise 1 – Task 1 : Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Exercise 2 – Task 2 : Every student should disassemble and **assemble the PC back to working condition.** Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Exercise 3 – Task 3 : Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Exercise 4 – Task 4 : Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Exercise 5 – Task 5 : Hardware Troubleshooting : Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Exercise 6 – Task 6 : Software Troubleshooting : Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Internet & World Wide Web

Exercise 7 - Task 1 : **Orientation & Connectivity Boot Camp :** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 8 - Task 3 : **Search Engines & Netiquette :** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors by the student.

MS Word

Exercise 9&10: The mentor needs to give an overview of Microsoft (MS) word 2007: Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word. Give a task covering to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Inserting table, using Drawing toolbar in word.

MS Excel

Exercise 11&12: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool covering Accessing, overview of toolbars, saving excel files, Using help and resources., Also give a task that is covering the features like Gridlines, Format Cells, Summation, auto fill, Formatting Text.

MS Power Point

Exercise 13&14: Students will be working on MS power point that helps them create basic power point presentation. Topics covered during this Exercise include :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students shall be given a model power point presentation which needs to be replicated (exactly how it's asked).

REFERENCES :
1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dream tech
2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson   Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. – CISCO Press, Pearson Education.
7. IT Essentials PC Hardware and Software Labs and Study Guide Third Edition by   Patrick Regan – CISCO Press, Pearson Education.
8. Troubleshooting,Maintaining and Repairing PCs,S.J.Bigelow,5th edition,TMH.

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(F0008101) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

Objectives:

The **Language Lab** focuses on the recognising and production practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.
To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
To help the students cultivate the habit of reading passages from the computer monitor, thus equip them with the required facility to face computer-based competitive exams such GRE, TOEFL, GMAT etc.

To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
To train them to use language effectively to face interviews, group discussions, public speaking.
To expose them to different techniques in resume preparation, report writing, format-making etc.

ENGLISH LANGUAGE LABORATORY

Syllabus

The following course content is prescribed for the English Language Laboratory Practice
1. Phonetics- Introduction to the Sounds of English – vowels, Diphthongs and consonants
2. Introduction to Stress, Accent, Intonation and Rhythm
3. Interpersonal communications and Situational Dialogues/Role play
4. Oral Presentations/Public speaking
5. Debate
6. Group Discussions
7. Facing interviews
8. Resume preparation

Exercise 1:
Phonetics –English pronunciation– basics in phonetics- introduction to sounds of English – vowels – diphthongs – consonants – phonetic transcription

Exercise 2:
Techniques to develop effective word accent- various stress patterns– developing voice quality and tone– intonation– rhythm– rhythm in connected speech

Exercise 3:
Fundamentals of interpersonal communication– starting a conversation- responding appropriately and relevantly

Exercise 4:
Dialogues- Formal and informal– using the right body language– role play in different situations.

Exercise 5:
Importance of Oral Presentations- developing and organizing the presentations– verbal and visual support in presentations– delivering the presentation

Exercise 6:
Informative, group and special occasion presentations– persuasive presentations

Exercise 7:
Formal and Informal debate– theory for debating– art of debating

Exercise 8:
Debate on various topics

Exercise 9:
Nature of group discussion– characteristics of successful GD's– strategies– techniques for individual contribution- intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.

Exercise 10:
Organizing Group Discussions

Exercise 11:
Interview Skills– concept and process, pre-interview planning, opening strategies, answering strategies, projecting a positive image, interview through tele and video-conferencing.

Exercise 12:
Organizing mock interviews

Exercise 13:
Resume design– structure and presentation, planning, defining the career objective, projecting one's strengths and skill-sets, summary.

Exercise 14:
Resume styles– job application letters

Minimum Requirement
Computer aided multi media language lab equipped with Computer systems in LAN facility. Conventional Language Lab. with audio and video systems, speakers, headphones and a teacher console so as to accommodate at least 60 students.
PRESCRIBED SOFTWARE: GLOBARENA

Suggested Software:
- Cambridge Advanced Learners' Dictionary with exercises
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Oxford Advanced Learner's Compass, 7th Edition
- Language in Use, Foundation Books Pvt Ltd
- Learning to Speak English - 4 CDs
- Microsoft Encarta
- Murphy's English Grammar, Cambridge
- Time series of IQ Test, Brain-teasers, Aptitude Test etc. English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

Books Suggested for English lab:
- Developing Communication Skills by Krishna Mohan & Meera Benerji (Macmillan)
- Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
- Oxford Practice Grammar with Answers, John Eastwood, Oxford
- Handbook of English Grammar and Usage, Mark Lester and Larry Beason, Tata McGraw-Hill
- A text book of English Phonetics for Indian Students by T.Balasubramanian (Macmillan)
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- English Skills for Technical Students, WBSCTE with British Council, OL
- Everyday Dialogues in English by Robert J Dixson, Prentice – Hall of India Ltd.
- Professional Communication by Koneru, McGraw Hill.

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(F0009102) ORGANISATION STRUCTURE AND PERSONNEL MANAGEMENT

UNIT I- Introduction to Management**:** Concepts of Management and organization – nature, importance and functions and theories of management, systems approach to management, leadership styles, social responsibilities of management.

UNIT II- Introduction to Organization**:** Designing Organizational structures: Basic concepts related to Organization – Departmentation and Decentralization, types and evaluation of mechanistic and structures of organization and suitability.

UNIT III- Decision Process Approach**:** Parts of organization system, development of corporate strategy, dynamics of decision, role of system. Types models: mathematical planning models, deterministic and probabilistic models.

UNIT IV- Personnel Management**:** Evolution, objectives, personnel policies. Personnel management vs HRM, position of the personnel department in the organization, Role of personnel manager as line manager and staff manager.

UNIT V- Man Power Planning: Need-strategies and limitations, manpower inventory, manpower forecasting, job description, recruitment, job specification and selection, interviewing techniques, transfers and promotion policies.

UNIT VI- Training and Development: Objectives and policies planning, organizing the training department, training manager and his job, on and off the job training techniques, career planning, objectives of performance appraisal.

UNIT VII- Understanding Human Behavior**:** Personality – Johari Window – Transactional Analysis. Perception: Perceptual process, Development of Attitudes and Values, Understanding Group Dynamics, Team Effectiveness, Strategies to deal with conflicts and stress.

UNIT VIII- Contemporary Strategies: Total Quality Management (TQM), six sigma, people capability maturity model (PCMM) levels, performance management, business process outsourcing (BPO), business process re-engineering, bench marking and balanced score card.

Text Books:
1. Organisational Behaviour, Robbins:Pearson,2008.
2. Management and Organizational Behavior, P.Subbarao HPH, 2009.

References:
1. Industrial Business Management, Martand T Telsang, S.Chand.
2. Human resources Management, Dr L.M.Prasad, S.Chand.
3. Dynamic personnel Administration, Rudrabasavaraj MN, Himalaya.
4. Personnel Management, Mamoria & Gankar, HPH, 2009.
5. Essentials of Management, Koontz & Weihrich, TMH, 2009.
6. Understanding Organisational Behaviour, Udai Pareek, P.H.I,2009.

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(F0010102) OBJECT ORIENTED PROGRAMMING

UNIT I
Different paradigms for problem solving, need for OOP paradigm, classes and instances, fundamental characteristics of OOP (Alan key), differences between OOP and Procedure Oriented Programming.

UNIT II
C++ Basics: Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Pointers and Arrays, Strings, Structures, References. Flow control statements- if, switch, while, for, do, break, continue, goto statements.

UNIT III
C++ Functions-Scope of variables, Parameter passing methods, Default arguments, inline functions, Recursive functions, Pointers to functions.
C++ Classes And Data Abstraction: Class definition, Class objects, Class scope, this pointer, Friends to a class, Static class members, Constant member functions, Constructors and Destructors, Data abstraction, ADT and information hiding.

UNIT IV
Dynamic memory allocation and de-allocation operators-new and delete, Dynamic creation and destruction of objects, Preprocessor directives, name spaces.
Polymorphism: Function overloading, Operator overloading, Generic programming-necessity of templates, Function templates and class templates.

UNIT V
Inheritance: Defining a class hierarchy, Different forms of inheritance, Defining the Base and Derived classes, Access to the base class members, Base and Derived class construction, Destructors, Virtual base class.

UNIT VI
Virtual Functions and Run Time Polymorphism: Overriding, Static and Dynamic bindings, Base and Derived class virtual functions, Dynamic binding through virtual functions, Virtual function call mechanism, Pure virtual functions, Abstract classes.

UNIT VII
C++ I/O: I/O using C functions, C++ Stream classes hierarchy, Stream I/O, File streams and String streams, File Operations, Overloading << and >> operators, Error handling during file operations, Formatted I/O.

UNIT VIII
Exception Handling: Benefits of exception handling, Throwing an exception, The try block, Catching an exception, Exception objects, Exception specifications, Stack unwinding, Re-throwing an exception, Catching all exceptions.

TEXT BOOKS:
1. C++, The Complete Reference, 4th Edition, Herbert Schildt, TMH.
2. Object Oriented Programming in C++, 4th Edition, R.Lafore, SAMS, Pearson Education

REFERENCES:
1. An Introduction to OOP, 3rd Edition, T. Budd, Pearson Education,2008.
2. Programming Principles and Practice Using C++, B.Stroutstrup, Addison- Wesley, Pearson Education.
3. Problem solving with C++, 6th Edition, Walter Savitch, Pearson Education,2007..
4. The Art, Philosophy and Science of OOP with C++, R.Miller,SPD.
5. OOP in C++, 3rd Edition, T.Gaddis, J.Walters and G.Muganda, Wiley DreamTech Press.
6. An Introduction to OOP in C++ with applications in Computer Graphics, 2nd Edition, G.M.Seed, Springer.

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(F0011102) COMPUTER ORGANIZATION

UNIT I

NUMBER SYSTEMS AND COMPUTER ARITHMETIC- Signed and unsigned numbers, Addition and subtraction, multiplication, division, Floating point representation, logical operation, Gray code, BCD codes, Error detecting codes, Boolean algebra, Simplification of Boolean expressions, K-Maps.

UNIT II

MEMORY ORGANIZATION-Memory hierarchy, Main memory-RAM, ROM chips, Memory address map, memory contention to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory-Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.

UNIT III

MICRO PROGRAMMED CONTROL **:** Control memory, Address sequencing, microprogram example, design of control unit, Hard wired control, Microprogrammed control

UNIT IV

BASIC CPU ORGANIZATION-Introduction to CPU, Instruction formats-INTEL-8086 CPU architecture-Addressing modes - generation of physical address- code segment registers, Zero, one, two, and three address instructions.

UNIT V

INTEL 8086 ASSEMBLY LANGUAGE INSTRUCTIONS-Data transfer instructions-input- output instructions, address transfer, Flag transfer, arithmetic, logical, shift, and rotate instructions.

UNIT VI

INTEL 8086 ASSEMBLY LANGUAGE INSTRUCTIONS Conditional and unconditional transfer, iteration control, interrupts and process control instructions, assembler directives, Programming with assembly language instructions.

UNIT VII

INPUT -OUTPUT ORGANIZATION-Peripheral devices, input-output interface-I/O Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA- DMA control, DMA transfer, Input output processor-CPU-IOP communication.

UNIT VIII

PIPELINE AND VECTOR PROCESSING **:** Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Vector Processing, Array Processors.

TEXT BOOKS:
1. Computer System Architecture, M. Morris Mano , 3rd Edition, PHI/Pearson Education,2008.
2. Microprocessors and Interfacing, Douglas Hall, Tata McGraw-Hill.

REFERENCES:
1. Computer Organization, Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Vth Edition, McGraw Hill.
2. Fundamentals of Computer Organization and Design, Sivarama P.Dandamudi, Springer Int. Edition.
3. Computer Organization and Architecture, William Stallings, 7th Edition, Pearson/PHI,2007.
4. Digital Design , M. Morris Mano, PHI/Pearson Education .

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(F0012102) OPERATING SYSTEMS

UNIT I
Operating System Introduction, Structures - Simple Batch, Multi programmed, timeshared,
Personal Computer, Parallel, Distributed Systems ,Real-Time Systems , System components, Operating-System services, System Calls, Virtual Machines, System Design and Implementation.

UNIT II
Process and CPU Scheduling - Process concepts and scheduling, Operation on processes, Cooperating Processes, Threads, and Interposes Communication Scheduling Criteria, Scheduling Algorithm, Multiple - Processor Scheduling, Real-Time Scheduling.

UNIT III
Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Demand Paging , Performance of Demanding Paging , Page Replacement ,Page Replacement Algorithm, Allocation of Frames, Thrashing.

UNIT IV
File System Interface and Implementation -Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management, Directory Management, Directory Implementation, Efficiency and Performance.

UNIT V
Process Management and Synchronization - The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors.

UNIT VI
Deadlocks - System Model, Dead locks Characterization, Methods for Handling Dead locks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

UNIT VII
Case Study-1- UNIX - Design Principles, Programmer Interface, User Interface, Process Management, Memory Management, File System, I/O System, Inter process Communication.

UNIT VIII
Introduction to distributed systems:
Distributed systems: goals hardware concepts software -design

TEXT BOOKS:
1. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley
2. Andrew S.Tanenbaum : Distributed operating system, Prentice Hall International Inc.1995

REFERENCE BOOKS:
1. Operating System A Design Approach-Crowley,TMH.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI
3. Operating Systems, Dhamdhere, TMH

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(F0013102) OPERATIONS RESEARCH

UNIT I
Introduction to Operations Research: Basics definition, scope, objectives, phases, models and limitations of Operations Research, Linear Programming Problem – Formulation of LPP, Graphical solution of LPP, Simplex Method, Artificial variables, big-M method, two-phase method, degeneracy and unbound solutions.

UNIT II
Revised simplex method- Formulation of LP Problems , Computational Procedure, Dualality in LP-Introduction, Comparison of solutions of the dual and its primal, Dual simple method.

UNIT III
Transportation Problem- Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions – Northwest corner rule, least cost method and Vogel's approximation method, Optimality test- the stepping stone method and MODI method.
Assignment model- Formulation, Hungarian method for optimal solution, Solving unbalanced problem, Traveling salesman problem as assignment problem.

UNIT IV
Sequencing models, Solution of Sequencing Problem – Processing n Jobs through 2 Machines – Processing n Jobs through 3 Machines – Processing 2 Jobs through m machines – Processing n Jobs through m Machines.

UNIT V
Replacement Models, Replacement of Items that Deteriorate whose maintenance costs increase with time without change in the money value, Replacement of items that fail suddenly: individual replacement policy, group replacement policy.

UNIT VI
Dynamic programming, Characteristics of dynamic programming, Dynamic programming approach for Priority Management employment smoothening, capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

UNIT VII
Games Theory, Competitive games, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game, Solution of games with saddle points, dominance principle, Rectangular games without saddle point – mixed strategy for 2 X 2 games.

UNIT VIII
Inventory models, Inventory costs, Models with deterministic demand – model (a) demand rate uniform and production rate infinite, model (b) demand rate non-uniform and production rate infinite, model (c) demand rate uniform and production rate finite.

TEXT BOOKS:
1. Operations Research, A.M. Natarajan, P. Balasubramani, A. Tamilarasi,Pearson Education, 2005.
2. Operations Research, P Sankara Iyer,Tata McGraw-Hill, 2008.

REFERENCES:
1. Operations Research, R. Panneerselvam, 2/e, PHI 2008.
2. Operations Research, P. K. Gupta and D. S. Hira, S. Chand & co., 2007.
3. Operations Research – Theory & Applications J K Sharma, 3/e, Macmillan India Ltd, 2007.
4. Operations Research, Col. D. S. Cheema, Laxmi Publications Ltd., 2005.
5. Introductory Operations Research – Theory and applications, H.S. Kansa & K.D. Kumar, Springer, 2005.
6. Operations Research , A.B.Rao, Jaico Publishers.

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(F0014102) PROGRAMMING IN C^{++} LAB

List of Sample Problems/Experiments:

1. Write a **C^{++}** program to find the sum of individual digits of a positive integer.

2. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C++ program to generate the first n terms of the sequence.

3. Write a **C^{++}** program to generate all the prime numbers between 1 and n , where n is a value supplied by the user.

4. Write **C^{++}** programs that use both recursive and non-recursive functions
   a. To find the factorial of a given integer.
   b. To find the GCD of two given integers.
   c. To find the nth Fibonacci number.

5. Write a **C^{++}** program that uses a recursive function for solving Towers of Hanoi problem.

6. Write a **C^{++}** program that uses functions
   a. To swap two integers.
   b. To swap two characters.
   c. To swap two reals. Note: Use overloaded functions.

7. Write a **C^{++}** program to find both the largest and smallest number in a list of integers.

8. Write a **C^{++}** program to sort a list of numbers in ascending order.

9. Write a **C^{++}** program that uses function templates to solve problems-7&8.

10. Write a **C^{++}** program to sort a list of names in ascending order.

11. Write a **C^{++}** program to implement the matrix ADT using a class. The operations supported by this ADT are:
   a) Reading a matrix.   b) Printing a matrix.   c) Addition of matrices.
   d) Subtraction of matrices.   e)Multiplication of matrices.

12. Implement the matrix ADT presented in the problem-11 using overloaded operators (<<, >>, +, -, *) and templates.

13. Implement the complex number ADT in C++ using a class. The complex ADT is used to represent complex numbers of the form c=a+ib, where a and b are real numbers. The operations supported by this ADT are:
   a) Reading a complex number.   d) Subtraction of complex numbers.
   b) Writing a complex number.   e) Multiplication of complex numbers.
   c) Addition of Complex numbers.   f) Division of complex numbers.

14. Write a C^{++} program that overloads the + operator and relational operators (suitable) to perform the following operations:
   a) Concatenation of two strings.
   b) Comparison of two strings.

15. Implement the complex number ADT in **C^{++}** using a class. The complex ADT is used to represent complex numbers of the form c=a+ib, where a and b are real numbers. The operations supported by this ADT are:
   a) Reading a complex number.   d) Subtraction of complex numbers.
   b) Writing a complex number.   e) Multiplication of complex numbers.
   c) Addition of Complex numbers.   f) Division of complex numbers.

Note: 1. overload << and >> operators in part a and part b.
   2. overload +, - , * , / operators in parts c, d, e and f.

16. Write a template based **C**++ program that determines if a particular value occurs in an array of values.

17. Write a **C**++ program that uses functions to perform the following operations:
    a. Insert a sub-string into the given main string from a given position.
    b. Delete n characters from a given position in a given string.

18. Write a **C**++ program that uses a function to reverse the given character string in place, without any duplication of characters.

19. Write a **C**++ program to make the frequency count of letters in a given text.

20. Write a **C**++ program to count the lines, words and characters in a given text.

21. Write a **C**++ program to determine if the given string is a palindrome or not.

22. Write a **C**++ program to make frequency count of words in a given text.

23. Write a **C**++ program that displays the position or index in the string S where the string t begins, or −1 if S doesn't contain t.

24. 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C++ program to find the 2's complement of a binary number.

25. Write a **C**++ program that counts the number of 1 bit in a given integer.

26. Write a **C**++ program to generate Pascal's triangle.

27. Write a **C**++ program to construct of pyramid of numbers.

28. Write a **C**++ program to compute the Sine series.

29. Write a **C**++ program that converts Roman numeral into an Arabic integer.

30. Write a C++ program which converts a positive Arabic integer into its corresponding Roman Numeral.

31. Write a **C**++ program to display the contents of a text file.

32. Write a **C**++ program which copies one file to another.

33. Write a **C**++ program that counts the characters, lines and words in the text file.

34. Write a **C**++ program to change a specific character in a file.
    Note: Filename, number of the byte in the file to be changed and the new character are specified on the command line.

35. Write a **C**++ program to reverse the first n characters in a file.

36. Write a **C**++ program that uses a function to delete all duplicate characters in the given string.

37. Write a **C**++ program that uses a function to convert a number to a character string.

38. Write a **C**++ program that uses a recursive function to find the binary equivalent of a given non-negative integer n.

39. Write a **C**++ program to generate prime numbers up to n using Sieve of Eratosthenes method.

40. Write a **C**++ program
    a) To write an object to a file.
    b) To read an object from the file

41. Write **C**++ programs that illustrate how the following forms of inheritance are supported:
    a) Single inheritance   b) Multiple inheritance

c) Multi level inheritance   d) Hierarchical inheritance

42. Write a **C^{++}** program that illustrates the order of execution of constructors and destructors when new class is derived from more than one base class.

43. Write a **C^{++}** program that illustrates how run time polymorphism is achieved using virtual functions.

44. Write a **C^{++}** program that illustrates the role of virtual base class in building class hierarchy.

45. Write a **C^{++}** program that illustrates the role of abstract class in building class hierarchy.

REFERENCES:

1. Mastering **C^{++}**, K.R.Venu Gopal, Raj Kumar and T.Ravi Shankar, TMH.
2. **C^{++}** Programming, D.S.Malik, Cengage Learning.
3. Practical **C^{++}** Programming, S.Qualline,SPD.
4. Object Oriented Programming with **C^{++}**, E.Balaguruswamy, 4th Edition, TMH,2008.
5. OOP with **C^{++}**, S.Sahay,Oxford Higher Education.
6. **C^{++}** and OOP Paradigm,D.Jana,2nd Edition, PHI
7. Fundamentals of **C^{++}** Programming,S.Subramanian,Jaico Publishing House.
8. **C^{++}** Programming, Al Stevens,7th edition,Wiley India.

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(F0015102) COMPUTER ORGANIZATION LAB

List of Sample Problems/Experiments:
Write assembly language programs for the following using MASAM.

1. Write assembly language programs to evaluate the expressions:
   i) a = b + c −d * e
   ii) z = x * y + w − v +u / k
       a. Considering   8-bit, 16 bit and 32 bit binary numbers as b, c, d, e.
       b. Considering 2 digit, 4digit and 8 digit BCD numbers.
     Take the   input in consecutive memory locations and results also. Display the results by using "int xx"
     of 8086. Validate program for the boundary conditions.

2. Write an ALP of 8086 to add two exponential numbers which are in IEEE 754 notation.
   Display the results by using "int xx" of 8086. Validate program for the boundary conditions.

3. Write an ALP of 8086 to take N numbers as input. And do the following operations on them.
   a) Arrange in ascending and Descending order.
   b) Find max and minimum
   c) Find average Considering 8-bit, 6 bit binary numbers and 2 digit, 4digit and 8 digit BCD
      numbers. Display the results by using "int xx" of 8086. Validate program for the boundary
      conditions.

4. Write an ALP of 8086 to take a string of as input (in 'C' format)and do the following Operations
   on it.
   a) Find the length   b) Find it is Palindrome or not
   c) Find whether given string substring or not.   d) Reverse a string
   e) Concatenate by taking another sting
   Display the results by using "int xx" of 8086.

5. Write the ALP to implement the above operations as procedures and call from the main procedure.

6. Write an ALP of 8086 to find the factorial of a given number as a Procedure and call from
   the main program which display the result.

7. Write an assembly language program to encrypt digits as shown below:
   Input digit   : 0 1 2 3 4 5 6 7 8 9
   Encrypted digit   : 4 6 9 5 0 3 1 8 7 2
   The program should accept a string consisting of digits. The encrypted string should be
   displayed using "int xx" of 8086.

8. Write a procedure to locate a character in a given string. The procedure receives a pointer to a
   string and character to be located. When the first occurrence of the character is located , its
   position is returned to main. If no match is found, a negative value is returned. The main
   procedure requests a character string and a character to be located and displays the result.

9. Write an assembly language program to read a string of characters from the user and that prints
   the vowel count . Display the results by using "int xx" of 8086.
   ex.   Input : Advanced Programming in UNIX

Out put:

Vowel	count
a or A	3
e or E	1
i or I	3
o or O	1
u or U	1

10. A computer uses RAM chips of 1024 X 1 capacity.
    a) How many chips are needed, and how should their address lines be connected to provide a memory capacity of 1024 bytes?
    b) How many chips are needed to provide a memory capacity of 16K bytes?

11. A computer employs RAM chips of 256X8 and ROM chips of 1024 X 8. The computer needs 2K bytes of RAM, 4K bytes of ROM, and four interface units, each with four registers. A memory-mapped I/O configuration is used. The two highest-order bits of the address bus are assigned 00 for RAM, 01 for ROM, 10 for interface registers.
    a) How many RAM and ROM chips are needed?
    b) Draw a memory-address map for the system.
    c) Give the address range in hexadecimal for RAM, ROM and interface.

12. Obtain the complement function for the match logic of one word in an associative memory. Draw the logic diagram for it and compare with the actual match logic diagram.

13. A two-way set associative cache memory uses blocks of four words. The cache can
     accommodate a total of 2048 words from main memory. The main memory size is 128K X 32.
    a) Formulate all pertinent information required to construct the cache memory.
    b) What is the size of the cache memory?

14. A digital computer has a memory unit of 64K X 16 and a cache memory of 1K words.
    The cache uses direct mapping with a block size of four words.
    a) How many bits are there in each word of cache, and how are they divided into functions? Include a valid bit.
    b) How many bits are there in the tag, index, block, and word fields of the address format?
    c) How many blocks can the cache accommodate?

15. An address space is specified by 24 bits and the corresponding memory space by 16 bits.
    a) How many words are there in the address space?
    b) How many words are there in the memory space?
    c) If a page consists of 2K words, how many pages and blocks are there in the system.

 16. A virtual memory has a page size of 1K words. There are eight pages and four blocks. The associative memory page table contains the following entries. Make a list of all virtual addresses(in decimal) that will cause a page fault.

Page	Block
0	3
1	1
4	2
6	0

REFERENCES:
1) IBM PC Assembly Language and Programming, P. Abel, 5th Edition, PHI/Pearson Education.
2) Introduction To Assembly Language Programming, Sivarama P.Dandamudi, Springer Int. Edition,2003.
3) The 8088 and 8086 Microprocessors: Programming , Interfacing,Software,Hardware and Application,4th edition,W.A.Triebel,A.Singh,N.K.Srinath,Pearson Education

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(F0016102) OPERATING SYSTEMS LAB

List of Sample Problems/Experiments:

1. Simulate the following CPU scheduling algorithms
   a) Round Robin   b) SJF   c) FCFS d) Priority

2. Simulate all file allocation strategies
   a) Sequential   b) Indexed   c) Linked

3. Simulate MVT and MFT

4. Simulate all File Organization Techniques
   a) Single level directory   b) Two level   c) Hierarchical d) DAG

5. Simulate Bankers Algorithm for Dead Lock Avoidance

6. Write a C program to create a child process and allow the parent to display "Hello" and the child to display "Welcome" on the screen.

7. Simulate all page replacement algorithms such as
   a) FIFO   b) LRU   c) LFU

8. Simulate Paging Technique of memory management.

9. Write C programs that make a copy of a file using i) standard I/O and
   ii) system calls.

10. Write C programs that count the number of blanks in a text file using
    i) standard I/O   and   ii) system calls.

REFERENCES:

1. Operating Systems, P.P. Choudhury, PHI Learning Private Ltd.
2. Operating Systems, R.Chopra, S.Chand and Company Ltd

II Year MCA - I Sem

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(F0017103) UNIX AND SHELL PROGRAMMING

UNIT I
Introduction to Unix:- Architecture of Unix, Features of Unix , Unix Commands – PATH, man, echo, printf, script, passwd, uname, who, date, stty, pwd, cd, mkdir, rmdir, ls, cp, mv, rm, cat, more, wc, lp, od, tar, gzip.

UNIT II
Unix Utilities:- Introduction to unix file system, vi editor, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, unlink, du, df, mount, umount, find, unmask, ulimit, ps, w, finger, arp, ftp, telnet, rlogin.Text processing utilities and backup utilities, detailed commands to be covered are tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, cpio

UNIT III
Introduction to Shells : Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

Filters
Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

UNIT IV
Grep : Operation, grep Family, Searching for File Content.
Sed : Scripts, Operation, Addresses, commands, Applications, grep and sed.

UNIT V
awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep, sed and awk.

UNIT VI
Interactive Korn Shell :
Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, Options, Startup Scripts, Command History, Command Execution Process.
Korn Shell Programming :
Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

UNIT VII
Interactive C Shell :
C shell features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval Command, Environmental Variables, On-Off Variables, Startup and Shutdown Scripts, Command History, Command Execution Scripts.

C Shell Programming :
Basic Script concepts, Expressions, Decisions: Making Selections, Repetition, special Parameters and Variables, changing Positional Parameters, Argument Validation, Debugging Scripts, Script Examples.

UNIT VIII

File Management : File Structures, System Calls for File Management – create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, Directory API – opendir, readdir, closedir, mkdir, rmdir, umask.

TEXT BOOKS :

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.

REFERENCES :

1. Unix for programmers and users, 3rd edition, Graham Glass, King Ables, Pearson   Education.
2. Unix programming environment, Kernighan and Pike, PHI. / Pearson Education
3. The Complete Reference Unix, Rosen, Host, Klee, Farber, Rosinski, Second Edition, TMH.

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II Year MCA - I Sem

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(F0018103) SOFTWARE ENGINEERING

UNIT I
Introduction to Software Engineering : The evolving role of software, Changing Nature of Software, Software myths.
A Generic view of process : Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment.

UNIT II
Process models : The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
Software Requirements : Functional and non-functional requirements, User requirements, System requirements, the software requirements document.

UNIT III
Requirements engineering process : Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.
System models : Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT IV
Design Engineering : Design process and Design quality, Design concepts, the design model.
Creating an architectural design : Software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT V
Performing User interface design : Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT VI
Testing Strategies : A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing.
Product metrics : Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT VII
Risk management : Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT VIII
Quality Management : Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES
1. Software Engineering- K.K. Agarwal & Yogesh Singh, New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz, John Wiely.
3. Systems Analysis and Design- Shely Cashman Rosenblatt,Thomson Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

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(F0019103) DATABASE MANAGEMENT SYSTEMS

UNIT I
Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor

UNIT II
History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT III
Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.
Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT IV
Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.

UNIT V
Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT VI
Overview of Transaction Management: ACID Properties – Transactions and Schedules– Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

UNIT VII
Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions – Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking.
Crash recovery: Introduction to ARIES – the Log – Other Recovery related Structures – the Write-Ahead Log Protocol – Check pointing – re3covering from a System Crash –Media recovery – Other approaches and Interaction with Concurrency control.

UNIT VIII
Storing data: Disks and Files: - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.
Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.
Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Extendable vs. Liner hashing.

TEXT BOOKS :
1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, McGraw hill, V edition.

REFERENCES :
1. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.
2. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
3. Introduction to Database Systems, C.J.Date Pearson Education

II Year MCA - I Sem

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(F0020103) COMPUTER NETWORKS

UNIT – I
Introduction : OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks , Arpanet, Internet, Network Topologies WAN, LAN, MAN.

UNIT - II
Physical Layer : Transmission media copper, twisted pair wireless, switching and encoding asynchronous communications; Narrow band, broad band ISDN and ATM.

UNIT - III
Data link layer : Design issues, framing, error detection and correction, CRC, Elementary Protocol-stop and wait, Sliding Window, Data link layer in HDLC, Internet.

UNIT - IV
Medium Access sub layer : ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X Standard Ethernet, wireless LANS. Bridges

UNIT - V
Network Layer : Virtual circuit and Datagram subnets-Routing algorithm shortest path routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.

UNIT – VI
Dynamic routing – Broadcast routing. Congestion, Control Algorithms – General Principles – of Congestion prevension policies. Internet working: The Network layer in the internet and in the ATM Networks.

UNIT –VII
Transport Layer: Transport Services, Connection management, TCP and UDP protocols; ATM AAL Layer Protocol.

UNIT – VIII
Application Layer – Network Security, Domain name system, SNMP, Electronic Mail; the World WEB, Multi Media.

TEXT BOOKS :
1. Computer Networks — Andrew S Tanenbaum, 4th Edition. Pearson Education/PHI
2. Data Communications and Networking – Behrouz A. Forouzan.Third Edition TMH.

REFERENCES :
1. An Engineering Approach to Computer Networks-S.Keshav, 2nd Edition, Pearson Education
2. Understanding communications and Networks, 3rd Edition, W.A. Shay, Thomson

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(F0021103) OOPS THROUGH JAVA

UNIT-I

Introduction : Creation of Java, importance of Java to internet, byte code, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, type conversion and casting, compiling and running of simple Java program.

UNIT-II

Classes and Objects : Concepts of classes and objects, class fundamentals Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion, nested classes and inner classes, exploring the String class.

UNIT-III

Inheritance: Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class.

UNIT-IV

Packages and Interfaces : Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-V

Exception Handling and Multithreading : Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT-VI

Event Handling : Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.
AWT : Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics.

UNIT-VII

AWT Controls : Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border,Grid, Card and Gridbag.
Swing – JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

UNIT-VIII

Applets – Concepts of Applets, differences between applets and applications,life cycle of an applet, types of applets, creating applets, passing parameters to applets.

TEXT BOOKS :
1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi.
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

REFERENCES :
1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. Beginning in Java 2, Iver Horton, Wrox Publications.
5. Java, Somasundaram, Jaico.

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(F0022103) UNIX AND SHELL PROGRAMMING LAB

Objectives:
- To teach students various unix utilities and shell scripting

Recommended Systems/Software Requirements:
- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux

Week1

Session-1
a) Log into the system
b) Use vi editor to create a file called myfile.txt which contains some text.
c) correct typing errors during creation.
d) Save the file
e) logout of the system

Session-2
a) Log into the system
b) Open the file created in session 1
c) Add some text
d) Change some text
e) Delete some text
f) Save the Changes
g) Logout of the system

Week2
a) Log into the system.
b) Use the cat command to create a file containing the following data. Call it mytable use tabs to separate the fields.

1425	Ravi	15.65
4320	Ramu	26.27
6830	Sita	36.15
1450	Raju	21.86

c) Use the cat command to display the file, mytable.
d) Use the vi command to correct any errors in the file, mytable.
e) Use the sort command to sort the file mytable according to the first field. Call the sorted file my table (same name)
f) Print the file mytable
g) Use the cut and paste commands to swap fields 2 and 3 of mytable. Call it my table (same name)
h) Print the new file, mytable
i) Logout of the system.

Week3
1) a) Login to the system.
   b) Use the appropriate command to determine your login shell.
   c) Use the /etc/passwd file to verify the result of step b.
   d) Use the who command and redirect the result to a file called myfile1. Use the more command to see the contents of myfile1.

e) Use the date and who commands in sequence (in one line) such that the output of date will display on the screen and the output of who will be redirected to a file called myfile2. Use the more command to check the contents of myfile2.

2. a) Write a sed command that deletes the first character in each line in a file.
   b) Write a sed command that deletes the character before the last character in each line in a file.
   c) Write a sed command that swaps the first and second words in each line in a file.

Week4
   a) Pipe your /etc/passwd file to awk, and print out the home directory of each user.
   b) Develop an interactive grep script that asks for a word and a file name and then tells how many lines contain that word.
   c) Repeat
   d) Part using awk

Week5
   a) Write a shell script that takes a command –line argument and reports on whether it is directory, a file, or something else.
   b) Write a shell script that accepts one or more file name as arguments and converts all of them to uppercase, provided they exist in the current directory.
   c) Write a shell script that determines the period for which a specified user is working on the system.

Week6
   a) Write a shell script that accepts a file name starting and ending line numbers as arguments and displays all the lines between the given line numbers.
   b) Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.

Week7
   a) Write a shell script that computes the gross salary of a employee according to the following rules:
      i)If basic salary is < 1500 then HRA =10% of the basic and DA =90% of the basic.
      ii)If basic salary is >=1500 then HRA =Rs500 and DA=98% of the basic
      The basic salary is entered interactively through the key board.
   b) Write a shell script that accepts two integers as its arguments and computers the value of first number raised to the power of the second number.

Week8
   a) Write an interactive file-handling shell program. Let it offer the user the choice of copying, removing, renaming, or linking files. Once the user has made a choice, have the program ask the user for the necessary information, such as the file name, new name and so on.
   b) Write shell script that takes a login name as command – line argument and reports when that person logs in
   c) Write a shell script which receives two file names as arguments. It should check whether the two file contents are same or not. If they are same then second file should be deleted.

Week9
   a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
   b) Develop an interactive script that ask for a word and a file name and then tells how many times that word occurred in the file.
   c) Write a shell script to perform the following string operations:
      i)To extract a sub-string from a given string.
      ii)To find the length of a given string.

Week10
Write a C program that takes one or more file or directory names as command line input and reports the following information on the file:
      i)File type

ii)Number of links

iii)Read, write and execute permissions

iv)Time of last access

(Note : Use stat/fstat system calls)

Week11

Write C programs that simulate the following unix commands:

a) mv

b) cp

(Use system calls)

Week12

Write a C program that simulates ls Command

(Use system calls / directory API)

TEXT BOOKS

1. Introduction to UNIX & SHELL programming, M.G. Venkatesh Murthy, Pearson Education.
2. Unix concepts and applications, Fourth Edition, Sumitabha Das, TMH.
3. Unix for programmers and users, 3rd edition, Gaham Glass & K. Ables, pearson education.
4. Unix and shell Programming –A text book, B.A. Forouzan & R.F. Giberg, Thomson.
5. Beginning shell scripting, E. Foster – Johnson & other, Wile Y- India.

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II Year MCA - I Sem

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3   2

(F0023103) DATA BASE MANAGEMENT SYSTEMS LAB

Objectives:
- To teach the student database design and query and PL/SQL.

Recommended Systems/Software Requirements:

- Intel based desktop PC
- Mysql /Oracle latest version Recommended

1) Creation, altering and droping of tables and inserting rows into a table (use constraints while creating tables) examples using SELECT command.

2) Queries (along with sub Queries) using ANY, ALL, IN, EXISTS, NOTEXISTS, UNION, INTERSET, Constraints.

   Example:- Select the roll number and name of the student who secured fourth rank in the class.

3) Queries using Aggregate functions (COUNT, SUM, AVG, MAX and MIN), GROUP BY, HAVING and Creation and dropping of Views.

4) Queries using Conversion functions (to_char, to_number and to_date), string functions (Concatenation, lpad, rpad, ltrim, rtrim, lower, upper, initcap, length, substr and instr), date functions (Sysdate, next_day, add_months, last_day, months_between, least, greatest, trunc, round, to_char, to_date)

5) i)Creation of simple PL/SQL program which includes declaration section, executable section and exception –Handling section (Ex. Student marks can be selected from the table and printed for those who secured first class and an exception can be raised if no records were found)

   ii)Insert data into student table and use COMMIT, ROLLBACK and SAVEPOINT in PL/SQL block.

6) Develop a program that includes the features NESTED IF, CASE and CASE expression. The program can be extended using the NULLIF and COALESCE functions.

7) Program development using WHILE LOOPS, numeric FOR LOOPS, nested loops using ERROR Handling, BUILT –IN Exceptions, USE defined Exceptions, RAISE- APPLICATION ERROR.

8) Programs development using creation of procedures, passing parameters IN and OUT of PROCEDURES.

9) Program development using creation of stored functions, invoke functions in SQL Statements and write complex functions.

10) Program development using creation of package specification, package bodies, private objects, package variables and cursors and calling stored packages.

11) Develop programs using features parameters in a CURSOR, FOR UPDATE CURSOR, WHERE CURRENT of clause and CURSOR variables.

12) Develop Programs using BEFORE and AFTER Triggers, Row and Statement Triggers and INSTEAD OF Triggers

TEXT BOOKS :
1. ORACLE   PL/SQL by example. Benjamin Rosenzweig, Elena Silvestrova, Pearson Education 3rd Edition
2. ORACLE DATA BASE LOG PL/SQL Programming SCOTT URMAN, Tata Mc- Graw Hill.
3. SQL & PL/SQL for Oracle 10g, Black Book, Dr.P.S. Deshpande.

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(F0024103) OBJECT ORIENTED PROGRAMMING LAB

1. Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

2. The Fibonacci sequence is defined by the following rule. The fist two values in the sequence are 1 and 1. Every subsequent value is the run of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that. Integer.

4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.

5. Write a Java program for sorting a given list of names in ascending order.

6. Write a Java program to multiply two given matrices.

7. Write a Java Program that reads a line of integers, and then displays each integers, and the sum of all the integers (use string to kenizer class)

8. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

9. Write a Java program that reads a file and displays a file and displays the file on the screen, with a line number before each line.

10. Write a Java program that displays the number of characters, lines and words in a text file.

11. Write a Java program that:

    a) Implements stack ADT. b) Converts infix expression into Postfix form.

12. Write an applet that displays a simple message.

13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Other wise the interest rate is annual.

14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.

15. Write a Java program for handling mouse events.

16. Write a Java program for creating multiple threads.

17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

18. Write a Java program that lets users create Pie charts. Design your own user interface (with swings & AWT).

19. Write a Java program that allows the user to draw lines, rectangles and OU.als.

20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

21. Write a Java program that illustrates how run time polymorphism is achieved.

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(F0025104) DATA WAREHOUSING AND DATA MINING

UNIT - I
Introduction : Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining. Data Warehouse Architecture, Data Warehouse Implementation

UNIT – II
Data Preprocessing : Needs Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.
Data Warehouse and OLAP Technology for Data Mining Data Warehouse, Multidimensional Data Model

UNIT - III
Data Mining Primitives, Languages, and System Architectures : Data Mining Primitives, Data Mining Query Languages, Architectures of Data Mining Systems.

UNIT - IV
Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction

UNIT - V
Mining Association Rules in Large Databases : Association Rule Mining, Mining Single-Dimensional Association Rules , Mining Multilevel Association Rules , Mining Multidimensional Association Rules from Relational Databases and Data Warehouses

UNIT - VI
Classification and Prediction : Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Classification by Backpropagation, Classification Based on Concepts from Association Rule Mining, Other Classification Methods, Prediction

UNIT - VII
Cluster Analysis Introduction : Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods.

UNIT - VIII
Mining Complex Types of Data : Multimensional Analysis and Descriptive Mining of Complex, Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Time-Series and Sequence Data, Mining Text Databases, Mining the World Wide Web.

TEXT BOOKS :
1. Data Mining – Concepts and Techniques - JIAWEI HAN & MICHELINE KAMBER Harcourt India.

REFERENCES :
1. Data Mining Introductory and advanced topics –MARGARET H DUNHAM, PEARSON EDUCATION
2. Data Mining Techniques – ARUN K PUJARI, University Press.
3. Data Warehousing in the Real World – SAM ANAHORY & DENNIS MURRAY. Pearson Edn Asia.
4. Data Warehousing Fundamentals – PAULRAJ PONNAIAH WILEY STUDENT EDITION.
5. The Data Warehouse Life cycle Tool kit – RALPH KIMBALL WILEY STUDENT EDITION.

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(F0026104) LINUX PROGRAMMING

UNIT I

Linux Utilities-File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, Filters, Text processing utilities and Backup utilities, sed – scripts, operation, addresses, commands, applications, awk – execution, fields and records, scripts, operation, patterns, actions, functions, using system commands in awk.

UNIT II

Working with the Bourne again shell(bash): Introduction, shell responsibilities, pipes and input Redirection, output redirection, here documents, running a shell script, the shell as a programming language, shell meta characters, file name substitution, shell variables, command substitution, shell commands, the environment, quoting, test command, control structures, arithmetic in shell, shell script examples, interrupt processing, functions, debugging shell scripts.

UNIT III

Linux Files: File Concept, File System Structure,Inodes, File types, The standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar, fgets, gets etc.), formatted I/O, stream errors, kernel support for files, System calls, library functions, file descriptors, low level file access - usage of open, creat, read, write, close, lseek, stat family, umask, dup, dup2, fcntl, file and record locking. file and directory management - chmod, chown, links(soft links & hard links - unlink, link, symlink), mkdir, rmdir, chdir, getcwd, Scanning Directories-opendir, readdir, closedir,rewinddir, seekdir, telldir functions.

UNIT IV

Linux Process – Process concept, Kernel support for process, process attributes, process hierarchy,process states,process composition, process control - process creation, waiting for a process, process termination, zombie process,orphan process, system call interface for process management-fork, vfork, exit, wait, waitpid, exec family, system.

UNIT V

Linux Signals – Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.

UNIT VI

Interprocess Communication : Introduction to IPC, IPC between processes on a single computer system, IPC between processes on different systems,pipes, FIFOs, Introduction to three types of IPC(Linux)-message queues, semaphores and shared memory.
Message Queues- Kernel support for messages, Linux APIs for messages, client/server example.
Semaphores-Kernel support for semaphores, Linux APIs for semaphores, file locking with semaphores.
Shared Memory- Kernel support for shared memory, Linux APIs for shared memory, semaphore and shared memory example.

UNIT VII

Multithreaded Programming – Differences between threads and processes,Thread structure and uses,Threads and Lightweight Processes,POSIX Thread APIs, Creating Threads,Thread Attributes,Thread Synchronization with semaphores and with Mutexes,Example programs.

UNIT VIII

Sockets: Introduction to Linux Sockets, Socket system calls for connection oriented protocol and connectionless protocol, example-client/server programs.

TEXT BOOKS:
1. Unix System Programming using C++, T.Chan, PHI.
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH,2006.
3. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition,rp-2008.

REFERENCES:

1. Linux System Programming, Robert Love, O'Reilly, SPD, rp-2007.
2. Unix Network Programming ,W.R.Stevens,PHI.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson   Education, 2003.
4. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.
5. System Programming with C and Unix,A.Hoover,Pearson.
6. Unix Programming, Kumar Saurabh, 1st Edition, Wiley India pvt Ltd.
7. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.

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(F0027104) WEB TECHNOLOGIES

Objectives:
This course demonstrate an in-depth understanding of the tools and Web technologies necessary for business application design and development. The course covers client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. And also XML and web servers and database interfacing.

UNIT I
HTML Common tags- List, Tables, images, forms, Frames; Cascading Style sheets;

UNIT II
Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script

UNIT III
XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT IV
Java Beans: Introduction to Java Beans, Advantages of Java Beans, BDK Introspection, Using Bound properties, Bean Info Interface, Constrained properties Persistence, Customizes, Java Beans API, Introduction to EJB's

UNIT V
Web Servers and Servlets: Tomcat web server, Introduction to Servelets: Lifecycle of a Serverlet, JSDK, The Servelet API, The javax.servelet Package, Reading Servelet parameters, Reading Initialization parameters. The javax.servelet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking, Security Issues,

UNIT VI
Introduction to JSP: The Problem with Servelet. The Anatomy of a JSP Page, JSP Processing. JSP Application Design with MVC Setting Up and JSP Environment: Installing the Java Software Development Kit, Tomcat Server & Testing Tomcat

UNIT VII
JSP Application Development: Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Error Handling and Debugging Sharing Data Between JSP pages, Requests, and Users Passing Control and Date between Pages – Sharing Session and Application Data – Memory Usage Considerations

UNIT VIII
Database Access : Database Programming using JDBC, Studying Javax.sql.* package,Accessing a Database from a JSP Page, Application – Specific Database Actions,Deploying JAVA Beans in a JSP Page, Introduction to struts framework..

TEXT BOOKS:
1. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech (UNIT s 1,2 ,3)
2. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert   Schildt. TMH (Chapters: 25) (UNIT 4)
3. Java Server Pages –Hans Bergsten, SPD O'Reilly (UNITs 5,6,7,8)

REFERENCE BOOKS:
1. Programming world wide web-Sebesta,Pearson
2. Core SERVLETS ANDJAVASERVER PAGES   VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson

3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly for chap 8.
5. Murach's beginning JAVA JDK 5, Murach, SPD
6. An Introduction to web Design and Programming –Wang-Thomson
7. Web Applications Technologies Concepts-Knuckles,John Wiley
8. Programming world wide web-Sebesta,Pearson
9. Web Warrior Guide to Web Programmming-Bai/Ekedaw-Thomas
10. Beginning Web Programming-Jon Duckett WROX.
11. Java Server Pages, Pekowsky, Pearson.

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(F0028104) EMBEDDED SYSTEMS
(Elective-I)

Unit - I
Embedded Computing : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (**Chapter I from Text Book 1, Wolf**).

Unit - II
The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts. (**Chapter 3 from Text Book 2, Ayala**).

Unit - III
Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.
(**Chapters 4,5 and 6 from Text Book 2, Ayala**).

Unit - IV
Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.
(**Chapter 7and 8 from Text Book 2, Ayala**)

Unit - V
Applications : Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (**Chapter 10 and 11 from Text Book 2, Ayala**).

Unit - VI
Introduction to Real – Time Operating Systems : Tasks and Task States, Tasks and Data, Semaphores, and Shared Data; Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management,
Interrupt Routines in an RTOS Environment. (**Chapter 6 and 7 from Text Book 3, Simon**).

Unit - VII
Basic Design Using a Real-Time Operating System : Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

Unit - VIII
Introduction to advanced architectures : ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (**Chapter 8 from Text Book 1, Wolf**).

TEXT BOOKS :
1. Computers as Components-principles of Embedded computer system design, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J.Ayala, Thomson.

REFERENCES :
1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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(F0029104) COMPUTER GRAPHICS
(Elective-I)

UNIT I
Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices (p.nos 22-90 of text book-1).

UNIT II
Output primitives : Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms.Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms (p.nos 103-123,137-145,147-150,164-171 of text book-1, p.nos. 72-99 of text book-2).

UNIT III
2-D geometrical transforms : Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems. (p.nos 204-227 of text book-1).

UNIT IV
2-D viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland – Hodgeman polygon clipping algorithm(p.nos 237-249,257-261 of text book -1, p.nos. 111-126 of text book-2).

UNIT V
3-D object representation : Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-Spline surfaces. Basic illumination models, polygon rendering methods. (p.nos 324-331,340-342, 347-364, 516-531, 542-546 of text book-1, p.nos 473-529,721-739 of text book-2).

UNIT VI
3-D Geometric transformations : Translation, rotation, scaling, reflection and shear transformations, composite transformations.
3-D viewing : Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping (p.nos 427-443, 452-481 of text book -1).

UNIT VII
Visible surface detection methods : Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods(p.nos 489-505 of text book -1, Chapter 15 of of text book-2).

UNIT VIII
Computer animation : Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications. (p.nos 604-616 of text book -1, chapter 21 of text book-2).

TEXT BOOKS :
1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education.
2. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.

REFERENCES :

1. "Computer Graphics", second Edition, Donald Hearn and M.Pauline Baker, PHI/Pearson Education.

2. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc-Graw hill edition.

3. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.

4. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.

5. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.

6. Computer Graphics, Steven Harrington, TMH

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(F0030104) INFORMATION SECURITY
(Elective-I)

UNIT - I
Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT - II
Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT - III
Public key cryptography principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT - IV
Email privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT - V
IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT - VI
Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - VII
Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.
Intruders, Viruses and related threats.

UNIT - VIII
Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

TEXT BOOKS :
1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech

REFERENCES :
1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.

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(F0031104) DISTRIBUTED DATABASES
(ELECTIVE - II)

UNIT I
Introdiuction to Distributed Databases: Features of Distributed versus Centralized Databases, why distributed databases?, Distributed Database Management Systems, Review of databases, Review of computer networks.

UNIT II
Principles Of Distributed Databases , Levels Of Distribution Transparency, Reference Architecture for Distributed Databases , Types o f Data Fragmentation, Integrity Constraints in Distributed Databases.

UNIT III
Distributed Database Design: A Framework for Distributed database Design,The Design of database Fragmentation

UNIT IV
Translation of Global Queries to Fragment Queries: Equivalence Transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

UNIT V
The Management of Distributed Transactions: A Framework for Transaction Management , Supporting Atomicity of Distributed Transactions, Concurrency Control for Distributed Transactions, Architectural Aspects of Distributed Transactions.

UNIT VI
Concurrency Control: Foundation of Distributed Concurrency Control, Distributed Deadlocks, Concurrency Control based on Timestamps, Optimistic Methods for Distributed Concurrency Control.

UNIT VII
Reliability: Basic Concepts, Nonblocking Commitment Protocols, Reliability and concurrency Control, Determining a Consistent View of the Network, Detection and Resolution of Inconsistency, Checkpoints and Cold Restart,

UNIT VII
Distributed Database Administration: Catalog Management in Distributed Databases, Authorization and Protection

TEXT BOOKS :
1. Distributed Database Principles & Systems, Stefano Ceri, Giuseppe Pelagatti McGraw-Hill

REFERENCES:
1. Principles of Distributed Database Systems, M.Tamer Ozsu, Patrick Valduriez – Pearson Education.

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(F0032104) ARTIFICIAL INTELLIGENCE
(ELECTIVE II)

UNIT - I
Introduction : AI problems, foundation of AI and history of AI intelligent agents: Agents and Environments, he concept of rationality, the nature of environments, structure of agents, problem solving agents, problem formulation.

UNIT - II
Searching : Searching for solutions, uniformed search strategies – Breadth first search, depth first search, Depth limited search, Iterative deepening depth first search bi-direction search - comparison. Search with partial information (Heuristic search) Greedy best first search, A* search, Memory bounded heuristic search, Heuristic functions.

UNIT - III
Local search Algorithms, Hill climbing, simulated, annealing search, local beam search, genetical algorithms.
Constrain satisfaction problems : Backtracking search for CSPs local search for constraint satisfaction problems.

UNIT - IV
Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT - V
Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the Wumpus world, logic, propositional logic, Resolution patterns in propos ional logic, Resolution, Forward & Backward.Chaining.

UNIT - VI
First order logic. Inference in first order logic, propositional Vs. first order inference, unification & lifts forward chaining, Backward chaining, Resolution.

UNIT - VII
Planning – Classical planning problem, Language of planning problems, Expressiveness and extension, planning with state – space search, Forward states spare search, Backward states space search, Heuristics for stats space search. Planning search, planning with state space search, partial order planning Graphs.

UNIT - VIII
Learning – Forms of learning, Induction learning, Learning Decision Tree, Statistical learning methods, learning with complex data, learning with Hidden variables – The EM Algorithm, Instance Based learning, Neural Networks.

TEXT BOOKS :
   1. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter Norvig, PHI/Pearson Education.
   2. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition.

REFERENCES :
   1. Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).
   2. Artificial Intelligence and Expert Systems – Patterson PHI.
   3. Expert Systems: Principles and Programming- Fourth Edn, Giarrantana/ Riley, Thomson.
   4. PROLOG Programming for Artificial Intelligence. Ivan Bratka- Third Edition – Pearson Education.

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(F0033104) ADVANCED COMPUTER ARCHITECTURE
(ELECTIVE - II)

UNIT - I

Fundamentals of Computer design- Technology trends- cost- measuring and reporting performance quantitative principles of computer design.

UNIT - II

Instruction set principles and examples- classifying instruction set- memory addressing- type and size of operands- addressing modes for signal processing-operations in the instruction set- instructions for control flow- encoding an instruction set.-the role of compiler

UNIT - III

Instruction level parallelism (ILP)- over coming data hazards- reducing branch costs –high performance instruction delivery- hardware based speculation- limitation of ILP

UNIT - IV

ILP software approach- compiler techniques- static branch protection - VLIW approach - H.W support for more ILP at compile time- H.W verses S.W Solutions

UNIT - V

Memory hierarchy design- cache performance- reducing cache misses penalty and miss rate – virtual memory- protection and examples of VM.

UNIT - VI

Multiprocessors and thread level parallelism- symmetric shared memory architectures- distributed shared memory- Synchronization- multi threading.

UNIT - VII

Storage systems- Types – Buses - RAID- errors and failures- bench marking a storage device- designing a I/O system.

UNIT - VIII

Inter connection networks and clusters- interconnection network media – practical issues in interconnecting networks- examples – clusters- designing a cluster.

TEXT BOOK :
1. Computer Architecture A quantitative approach 3rd edition John L. Hennessy & David A. Patterson Morgan Kufmann (An Imprint of Elsevier)

REFERENCES :
2. "Computer Architecture and parallel Processing" Kai Hwang and A.Briggs International Edition McGraw-Hill.
3. Advanced Computer Architectures, Dezso Sima, Terence Fountain, Peter Kacsuk, Pearson.
4. Parallel Computer Architecture, A Hardware / Software Approach, David E. Culler, Jaswinder Pal singh with Anoop Gupta, Elsevier

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(F0034104) DATA WAREHOUSING AND DATA MINING LAB

The objective of the lab exercises is to use data mining techniques to identify customer segments and understand their buying behavior and to use standard databases available to understand DM processes using WEKA (or any other DM tool)

1. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.

2. Using IBM OLAP Miner – Understand the use of data mining for evaluating

3. the content of multidimensional cubes.

4. Using Teradata Warehouse Miner – Create mining models that are executed in SQL. (BI Portal Lab: The objective of the lab exercises is to integrate pre-built reports into a portal application).

5. Publish cognos cubes to a business intelligence portal.

6. Metadata & ETL Lab: The objective of the lab exercises is to implement metadata import agents to pull metadata from leading business intelligence tools and populate a metadata repository. To understand ETL processes.

7. Import metadata from specific business intelligence tools and populate a meta data repository.

8. Publish metadata stored in the repository.

9. Load data from heterogenous sources including text files into a pre-defined warehouse schema. Case study.

10. Design a data mart from scratch to store the credit history of customers of a bank. Use this credit profiling to process future loan applications.

11. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'. This should be able to serve the analytical needs of the various government departments and also provide a global integrated view

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(F0035104) LINUX PROGRAMMING LAB

Note: Use Bash for Shell scripts.

1. Write a shell script that accepts a file name, starting and ending line numbers as arguments and displays all the lines between the given line numbers.
2. Write a shell script that deletes all lines containing a specified word in one or more files supplied as arguments to it.
3. Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
4. Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.
5. Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
6. Write a shell script to list all of the directory files in a directory.
7. Write a shell script to find factorial of a given integer.
8. Write an awk script to count the number of lines in a file that do not contain vowels.
9. Write an awk script to find the number of characters, words and lines in a file.
10. Write a c program that makes a copy of a file using standard I/O and system calls.
11. Implement in C the following Unix commands using System calls
          A . cat   B. ls   C. mv
12. Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
          A. File type.   B. Number of links.
          C. Time of last access.   D. Read, Write and Execute permissions.
13. Write a C program to emulate the Unix ls –l command.
14. Write a C program to list for every file in a directory, its inode number and file name.
15. Write a C program that demonstrates redirection of standard output to a file.Ex:ls> f1.
16. Write a C program to create a child process and allow the parent to display "parent"   and the child to display "child" on the screen.
17. Write a C program to create a Zombie process.
18. Write a C program that illustrates how an orphan is created.
19. Write a C program that illustrates how to execute two commands concurrently with a command pipe.   Ex:- ls –l | sort
20. Write C programs that illustrate communication between two unrelated processes using named pipe.
21. Write a C program (sender.c) to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
22. Write a C program (receiver.c) that receives the messages (from the above message queue as specified in (21)) and displays them.

TEXT BOOKS:
1. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.
3. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education, 2005.
4. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
5. Sed and Awk, O.Dougherty&A.Robbins,2nd edition,SPD.

MCA II YEAR – II SEM   P   C
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(F0036104) WEB TECHNOLOGIES LAB

Objective :
        To create a fully functional website with mvc architecture. To Develop an online Book store using we can sell books (Ex amazon .com).

Hardware and Software required :
1. A working computer system with either Windows or Linux
2. A web browser either IE or firefox
3. Tomcat web server and Apache web server
4. XML editor like Altova Xml-spy [www.Altova.com/**XML**Spy – free] , Stylusstudio , etc.,
5. A database either Mysql or Oracle
6. JVM(Java virtual machine) must be installed on your system
7. BDK(Bean development kit) must be also be installed

Week-1:

Design the following static web pages required for an online book store web site.
1) **HOME PAGE:**
The static home page must contain three **frames**.

Top frame   : Logo and the college name and links to Home page, Login page, Registration page, Catalogue page and Cart page (the description of these pages will be given below).

Left frame   : At least four links for navigation, which will display the catalogue of respective links.
            For e.g.: When you click the link **"CSE"** the catalogue for **CSE** Books should be displayed in
            the Right frame.

Right frame: The *pages to the links in the left frame must be loaded here*. Initially this page contains description of the web site.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Description of the Web Site			

Fig 1.1
2) LOGIN PAGE:
        This page looks like below:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL	Login : [_____] Password: [_____] Submi Reset			

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3) CATOLOGUE PAGE:

The catalogue page should contain the details of all the books available in the web site in a table.
The details should contain the following:

1. Snap shot of Cover Page.
2. Author Name.
3. Publisher.
4. Price.
5. Add to cart button.

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
CSE ECE EEE CIVIL		Book : XML Bible Author : Winston Publication : Wiely	$ 40.5	Add to cart
		Book : AI Author : S.Russel Publication : Princeton hall	$ 63	Add to cart
		Book : Java 2 Author : Watson Publication : BPB publications	$ 35.5	Add to cart
		Book : HTML in 24 hours Author : Sam Peter Publication : Sam publication	$ 50	Add to cart

Note: Week 2 contains the remaining pages and their description.

Week-2:

4) CART PAGE:

The cart page contains the details about the books which are added to the cart.
The cart page should look like this:

Logo	Web Site Name			
Home	Login	Registration	Catalogue	Cart
	Book name	**Price**	**Quantity**	**Amount**
CSE	Java 2	$35.5	2	$70
ECE	XML bible	$40.5	1	$40.5
EEE				
CIVIL		**Total amount**		$130.5

5) REGISTRATION PAGE:

Create a "*registration form* "with the following fields

           1) Name (Text field)
           2) Password (password field)
           3) E-mail id (text field)

4) Phone number (text field)
5) Sex (radio button)
6) Date of birth (3 select boxes)
7) Languages known (check boxes – English, Telugu, Hindi, Tamil)
8) Address (text area)

WEEK 3:
VALIDATION:
Write *JavaScript* to validate the following fields of the above registration page.
1. Name (Name should contains alphabets and the length should not be less than 6 characters).
2. Password (Password should not be less than 6 characters length).
3. E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com)
4. Phone number (Phone number should contain 10 digits only).

Note : You can also validate the login page with these parameters.

Week-4:
Design a web page using **CSS (C**ascading **S**tyle **S**heets**)** which includes the following:
1) Use different font, styles:
In the style definition you define how each selector should work (font, color etc.).
Then, in the body of your pages, you refer to these selectors to activate the styles.
For example:

```
<HTML>
<HEAD>
<style type="text/css">
B.headline {color:red; font-size:22px; font-family:arial; text-
decoration:underline}
</style>
</HEAD>
<BODY>
<b>This is normal bold</b><br>
Selector {cursor:value}
For example:
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
<b class="headline">This is headline style bold</b>
</BODY>
</HTML>
```

2) Set a background image for both the page and single elements on the page.
You can define the background image for the page like this:

```
BODY {background-image:url(myimage.gif);}
```

3) Control the repetition of the image with the background-repeat property.
   As background-repeat: repeat Tiles the image until the entire page is filled, just like an ordinary background image in   plain HTML.

4) Define styles for links as
        A:link
        A:visited
        A:active
        A:hover
   Example:
        <style type="text/css">
        A:link {text-decoration: none}
        A:visited {text-decoration: none}
        A:active {text-decoration: none}
        A:hover {text-decoration: underline; color: red;}
        </style>
5) Work with layers:
   For example:
        LAYER 1 ON TOP:
        <div style="position:relative; font-size:50px; z-index:2;">LAYER 1</div>
        <div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:1">LAYER 2</div>

        LAYER 2 ON TOP:
        <div style="position:relative; font-size:50px; z-index:3;">LAYER 1</div>
        <div style="position:relative; top:-50; left:5; color:red; font-size:80px; z-index:4">LAYER 2</div>
6) Add a customized cursor:
   Selector {cursor:value}
   For example:

```
<html>
<head>
<style type="text/css">
.xlink {cursor:crosshair}
.hlink{cursor:help}
</style>
</head>
<body>
<b>
<a href="mypage.htm" class="xlink">CROSS LINK</a>
<br>
<a href="mypage.htm" class="hlink">HELP LINK</a>
</b>
</body>
</html>
```

Week-5:
Write an XML file which will display the Book information which includes the following:
     1) Title of the book
     2) Author Name
     3) ISBN number
     4) Publisher name
     5) Edition

6) Price

Write a Document Type Definition (DTD) to validate the above XML file.

Display the XML file as follows.

The contents should be displayed in a table. The header of the table should be in color GREY. And the Author names column should be displayed in one color and should be capitalized and in bold. Use your own colors for remaining columns.

Use XML schemas XSL and CSS for the above purpose.

Note: Give at least for 4 books. It should be valid syntactically.

Hint: You can use some xml editors like XML-spy

Week-6:
VISUAL BEANS:

Create a simple visual bean with a area filled with a color.

The shape of the area depends on the property shape. If it is set to true then the shape of the area is Square and it is Circle, if it is false.

The color of the area should be changed dynamically for every mouse click. The color should also be changed if we change the color in the "property window ".

Week-7:

1) Install TOMCAT web server and APACHE.
   While installation assign port number 4040 to TOMCAT and 8080 to APACHE. Make sure that these ports are available i.e., no other process is using this port.

2) Access the above developed static web pages for books web site, using these servers by putting the web pages developed in week-1 and week-2 in the document root. Access the pages by using the urls : http://localhost:4040/rama/books.html (for tomcat)
    http://localhost:8080/books.html (for Apache)

Week-8:
User Authentication :

Assume four users user1,user2,user3 and user4 having the passwords pwd1,pwd2,pwd3 and pwd4 respectively. Write a servelet for doing the following.

1. Create a Cookie and add these four user id's and passwords to this Cookie.

2. Read the user id and passwords entered in the Login form (week1)   and authenticate with the values (user id and passwords) available in the cookies.

If he is a valid user(i.e., user-name and password match) you should welcome   him by name(user-name) else you should display " You are not an authenticated user ". Use init-parameters to do this. Store the user-names and passwords in the webinf.xml and access them in the servlet by using the getInitParameters() method.

Week-9:

Install a database(Mysql or Oracle).

Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

Practice 'JDBC' connectivity.

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page (week2).

Week-10:

Write a JSP which does the following job:
Insert the details of the 3 or 4 users who register with the web site (week9) by using registration form. Authenticate the user when he submits the login form using the user name and password from   the database (similar to week8 instead of cookies).

Week-11:

Create tables in the database which contain the details of items (books in our case like Book name , Price, Quantity, Amount)) of each category. Modify your catalogue page (week 2)in such a way that you should connect to the database and extract data from the tables and display them in the catalogue page using JDBC.

Week-12:

HTTP is a stateless protocol. Session is required to maintain the state.
The user may add some items to cart from the catalog page. He can check the cart page for the selected items. He may visit the catalogue again and select some more items. Here our interest is the selected items should be added to the old cart rather than a new cart. Multiple users can do the same thing at a time(i.e., from different systems in the LAN using the ip-address instead of localhost). This can be achieved through the use of sessions. Every user will have his own session which will be created after his successful login to the website. When the user logs out his session should get invalidated (by using the method session.invalidate()).
Modify your catalogue and cart JSP pages to achieve the above mentioned functionality using sessions.

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(F0037105) NETWORK PROGRAMMING

UNIT-I

Introduction to Network Programming: OSI model, Unix standards, TCP and UDP & TCP connection establishment and Format, Buffer sizes and limitation, standard internet services, Protocol usage by common internet application.

UNIT-II

Sockets : Address structures, value – result arguments, Byte ordering and manipulation function and related functions Elementary TCP sockets – Socket, connect, bind, listen, accept, fork and exec function, concurrent servers. Close function and related function.

UNIT-III

TCP client server : Introduction, TCP Echo server functions, Normal startup, terminate and signal handling server process termination, Crashing and Rebooting of server host shutdown of server host.

UNIT-IV

I/O Multiplexing and socket options: I/O Models, select function, Batch input, shutdown function, poll function, TCP Echo server, getsockopt and setsockopt functions. Socket states, Generic socket option IPV6 socket option ICMPV6 socket option IPV6 socket option and TCP socket options.

UNIT-V

Elementary UDP sockets: Introduction UDP Echo server function, lost datagram, summary of UDP example, Lack of flow control with UDP, determining outgoing interface with UDP.

UNIT-VI

Elementary name and Address conversions: DNS, gethost by Name function, Resolver option, Function and IPV6 support, uname function, other networking information.

UNIT-VII

IPC : Introduction, File and record locking, Pipes, FIFOs streams and messages, Name spaces, system IPC, Message queues, Semaphores.

UNIT-VIII

Remote Login: Terminal line disciplines, Pseudo-Terminals, Terminal modes, Control Terminals, rlogin Overview, RPC Transparency Issues.

TEXT BOOKS:
1. UNIX Network Programming, Vol. I, Sockets API, 2nd Edition. - W.Richard Stevens, Pearson   Edn. Asia.
2. UNIX Network Programming, 1st Edition, - W.Richard Stevens. PHI.

REFERENCES:
1. UNIX Systems Programming using C++ T CHAN, PHI.
2. UNIX for Programmers and Users, 3rd Edition Graham GLASS, King abls, Pearson Education
3. Advanced UNIX Programming 2nd Edition M. J. ROCHKIND, Pearson Education

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(F0038105) OBJECT ORIENTED ANALYSIS AND DESIGN USING UML

UNIT - I
Introduction to UML : Importance of modeling, principles of modeling, object oriented modeling, conceptual model of the UML, Architecture, Software Development Life Cycle.

UNIT - II
Basic Structural Modeling : Classes, Relationships, common Mechanisms, and diagrams.
Advanced Structural Modeling : Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages.

UNIT - III
Class & Object Diagrams : Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT- IV
Basic Behavioral Modeling-I : Interactions, Interaction diagrams.

UNIT - V
Basic Behavioral Modeling-II : Use cases, Use case Diagrams, Activity Diagrams.

UNIT - VI
Advanced Behavioral Modeling : Events and signals, state machines, processes and Threads, time and space, state chart diagrams.

UNIT-VII
Architectural Modeling : Component, Deployment, Component diagrams and Deployment diagrams.

UNIT - VIII
Case Study : The Unified Library application, ATM Application.

TEXT BOOKS :
   1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide, Pearson Education.
   2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-Dreamtech India Pvt. Ltd.

REFERENCE BOOKS:
   1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
   2. Pascal Roques: Modeling Software Systems Using UML2, WILEY-Dreamtech India Pvt. Ltd.
   3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.
   4. Mark Priestley: Practical Object-Oriented Design with UML,TATA McGrawHill
   5. Appling UML and Patterns: An introduction to Object – Oriented Analysis and Design and Unified Process, Craig Larman, Pearson Education.

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(F0039105) SOFTWARE TESTING METHODOLOGIES

UNIT I :
Introduction : Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs

UNIT II :
Flow graphs and Path testing : Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT III :
Transaction Flow Testing : Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing.

UNIT IV :
Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domains and interfaces testing, domain and interface testing, domains and testability.

UNIT V :
Paths, Path products and Regular expressions : Path products & path expression, reduction procedure, applications, regular expressions & flow anomaly detection.

UNIT VI :
Logic Based Testing : Overview, decision tables, path expressions, kv charts, specifications.

UNIT VII :
State, State Graphs and Transition testing : State graphs, good & bad state graphs, state testing, Testability tips.

UNIT VIII :
Graph Matrices and Application : Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.
Usage of JMeter and Winrunner tools for functional / Regression testing, creation of test script for unattended testing, synchronization of test case, Rapid testing, Performance testing of a data base application and HTTP connection for website access.

TEXT BOOKS :
1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.

REFERENCES :
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.
4. Effective methods of Software Testing, Perry, John Wiley.
5. Art of Software Testing – Meyers, John Wiley.

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(F0040105) E – COMMERCE
(Elective-1)

UNIT - I

Electronic Commerce-Frame work, anatomy of E-Commerce applications, E-Commerce Consumer applications, E-Commerce organization applications.

UNIT - II

Consumer Oriented Electronic commerce - Mercantile Process models.

UNIT - III

Electronic payment systems - Digital Token-Based, Smart Cards, Credit Cards, Risks in Electronic Payment systems.

UNIT-IV

Inter Organizational Commerce - EDI, EDI Implementation, Value added networks.

UNIT - V

Intra Organizational Commerce - work Flow, Automation Customization and internal Commerce, Supply chain Management.

UNIT - VI

Corporate Digital Library - Document Library, digital Document types, corporate Data Warehouses. Advertising and Marketing - Information based marketing, Advertising on Internet, on-line marketing process, market research.

UNIT - VII

Consumer Search and Resource Discovery - Information search and Retrieval, Commerce Catalogues, Information Filtering.

UNIT - VIII

Multimedia - key multimedia concepts, Digital Video and electronic Commerce, Desktop video processings, Desktop video conferencing.

TEXT BOOK :
1. Frontiers of electronic commerce – Kalakata, Whinston, Pearson.

REFERENCES :
1. E-Commerce fundamentals and applications Hendry Chan, Raymond Lee, Tharam Dillon, Ellizabeth Chang, John Wiley.
2. E-Commerce, S.Jaiswal – Galgotia.
3. E-Commerce, Efrain Turbon, Jae Lee, David King, H.Michael Chang.
4. Electronic Commerce – Gary P.Schneider – Thomson.
5. E-Commerce – Business, Technology, Society, Kenneth C.Taudon, Carol Guyerico Traver.

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(F0041105) MULTIMEDIA AND APPLICATION DEVELOPMENT
(ELECTIVE - I)

UNIT - I
Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

UNIT - II
Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

UNIT - III
Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class.

UNIT - IV
Action Script II : Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

UNIT - V
Application Development : An OOP Application Frame work, Using Components with ActionScript MovieClip Subclasses.

UNIT - VI
Multimedia data compression : Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, Wavelet-Based Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

UNIT - VII
Basic Video Compression Techniques: Introduction to video compression, video compression based on motion compensation, search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT - VIII
Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications : Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

TEXT BOOKS :
1. Fudamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI/Pearson Education.
2. Essentials ActionScript 2.0, Colin Moock, SPD O,REILLY.

REFERENCES :
1. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
2. Macromedia Flash MX Professional 2004 Unleashed, Pearson.
3. Multimedia and communications Technology, Steve Heath, Elsevier(Focal Press).
4. Multimedia Applications, Steinmetz, Nahrstedt, Springer.
5. Multimedia Basics by Weixel Thomson
6. Multimedia Technology and Applications, David Hilman , Galgotia

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(F0042105) IMAGE PROCESSING
(ELECTIVE I)

UNIT - I

Introduction : Examples of fields that use digital image processing, fundamental steps in digital image processing, components of image processing system.. Digital Image Fundamentals: A simple image formation model, image sampling and quantization, basic relationships between pixels (p.nos. 15-17, 21- 44, 50-69).

UNIT - II

Image enhancement in the spatial domain : Basic gray-level transformation, histogram processing, enhancement using arithmetic and logic operators, basic spatial filtering, smoothing and sharpening spatial filters, combining the spatial enhancement methods (p.nos 76-141).

UNIT - III

Image restoration : A model of the image degradation/restoration process, noise models, restoration in the presence of noise–only spatial filtering, Weiner filtering, constrained least squares filtering, geometric transforms; Introduction to the Fourier transform and the frequency domain, estimating the degradation function (p.nos 147-167, 220-243, 256-276).

UNIT - IV

Color Image Processing : Color fundamentals, color models, pseudo color image processing, basics of full–color image processing, color transforms, smoothing and sharpening, color segmentation (p.nos: 282-339).

UNIT - V

Image Compression : Fundamentals, image compression models, error-free compression, lossypredictive coding, image compression standards (p.nos: 409-467,492-510).

UNIT - VI

Morphological Image Processing : Preliminaries, dilation, erosion, open and closing, hit or miss transformation, basic morphologic algorithms (p.nos:519-550).

UNIT - VII

Image Segmentation : Detection of discontinuous, edge linking and boundary detection, thresholding, region–based segmentation (p.nos: 567-617).

UNIT - VIII

Object Recognition : Patterns and patterns classes, recognition based on decision–theoretic methods, matching, optimum statistical classifiers, neural networks, structural methods – matching shape numbers, string matching (p.nos: 693-735).

TEXT BOOK :
1. Digital Image Processing, Rafeal C.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI.

REFERENCES :
1. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav Hlavac and Roger Boyle, Second Edition, Thomson Learning.
2. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
3. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications
4. Digital Image Processing using Matlab, Rafeal C.Gonzalez, Richard E.Woods, Steven L. Eddins, Pearson Education.
5. Digital Image Processing, William K. Prat, Wily Third Edition
6. Digital Image Processing and Analysis, B. Chanda, D. Datta Majumder, Prentice Hall of India, 2003.

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(F0043105) SOFTWARE PROJECT MANAGEMENT
(Elective-II)

UNIT - I
Conventional Software Management : The waterfall model, conventional software Management performance.
Evolution of Software Economics : Software Economics, pragmatic software cost estimation.

UNIT - II
Improving Software Economics : Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.
The old way and the new : The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - III
Life cycle phases : Engineering and production stages, inception, Elaboration, construction, transition phases.
Artifacts of the process : The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT - IV
Model based software architectures : A Management perspective and technical perspective.
Work Flows of the process : Software process workflows, Iteration workflows.

UNIT - V
Checkpoints of the process : Major mile stones, Minor Milestones, Periodic status assessments.
Iterative Process Planning : Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT - VI
Project Organizations and Responsibilities : Line-of-Business Organizations, Project Organizations, evolution of Organizations.
Process Automation: Automation Building blocks, The Project Environment.

UNIT - VII
Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.
Tailoring the Process : Process discriminants.

UNIT - VIII
Future Software Project Management : Modern Project Profiles, Next generation Software economics, modern process transitions.
Case Study: The command Center Processing and Display system- Replacement (CCPDS-R)

TEXT BOOK :
1. Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCES :
1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

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(F0044105) MIDDLEWARE TECHNOLOGIES

(Elective-ll)

UNIT-I:
Introduction to client server computing: Evolution of corporate computing models from centralized to distributed computing, client server models. Benefits of client server computing, pitfalls of client server programming.

UNIT-II:
CORBA with Java: Review of Java concept like RMI, RMI API, JDBC. Client/Server CORBA-style, The object web: CORBA with Java.

UNIT III:
Introducing C# and the .NET Platform; Understanding .NET Assemblies; Object – Oriented Programming with C#; Callback Interfaces, Delegates, and Events.

UNIT IV:
Building c# applications: Type Reflection, Late Binding, and Attribute-Based Programming; Object Serialization and the .NET Remoting Layer; Data Access with ADO.NET; XML Web Services.

UNIT-V:
Core CORBA / Java: Two types of Client/ Server invocations-static, dynamic. The static CORBA, first CORBA program, ORBlets with Applets, Dynamic CORBA-The portable count, the dynamic count multi count.

UNIT-VI:
Existential CORBA: CORBA initialization protocol, CORBa activation services, CORBAIDL mapping CORBA java- to- IDL mapping, The introspective CORBA/Java object.

UNIT-VII:
Java Bean Component Model: Events, properties, persistency, Intrespection of beans, CORBA Beans

UNIT-VIII:
EJBs and CORBA: Object transaction monitors CORBA OTM's, EJB and CORBA OTM's, EJB container frame work, Session and Entity Beans, The EJB client/server development Process The EJB container protocol, support for transaction EJB packaging EJB design Guidelines.

Text Books:
1. Client/Server programming with Java and CORBA Robert Orfali and Dan Harkey, John Wiley & Sons, SPD 2nd Edition
2. Java programming with CORBA 3rd Edition, G.Brose, A Vogel and K.Duddy, Wiley-dreamtech, India John wiley and sons
3. C# and the .NET Platform Andrew Troelsen, Apress Wiley-dreamtech, India Pvt Ltd

Reference: Books:
1. Distributed Computing, Principles and applications, M.L.Liu, Pearson Education
2. Client/Server Survival Guide 3rd edition Robert Orfali Dan Harkey and Jeri Edwards, John Wiley & Sons
3. Client/Server Computing D T Dewire, TMH.
4. IBM Webspere Starter Kit Ron Ben Natan Ori Sasson, TMh, New Delhi
5. Programming C#, Jesse Liberty, SPD-O'Reilly.
6. C# Preciesely Peter Sestoft and Henrik I. Hansen, Prentice Hall of India
7. Intoduction to C# Using .NET Pearson Education
8. C# How to program, Pearson Education

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(F0045105) CLOUD COMPUTING

(Elective-ll)

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(F0046105) NETWORK PROGRAMMING LAB

SOCKET PROGRAMMING:

Objectives:
- To teach students various forms of IPC through Unix and socket Programming

Recommended Systems/Software Requirements:
- Intel based desktop PC with minimum of 166 MHZ or faster processor with atleast 64 MB RAM and 100 MB free disk space LAN Connected
- Any flavour of Unix / Linux

Week1.
Implement the following forms of IPC.
a)Pipes
b)FIFO

Week2.
Implement file transfer using Message Queue form of IPC

Week3.
Write a programme to create an integer variable using shared memory concept and increment the variable simultaneously by two processes. Use senphores to avoid race conditions

Week4.
Design TCP iterative Client and server application to reverse the given input sentence

Week5.
Design TCP iterative Client and server application to reverse the given input sentence

Week6.
Design TCP client and server application to transfer file

Week7.
Design a TCP concurrent server to convert a given text into upper case using multiplexing system call "select"

Week8.
Design a TCP concurrent server to echo given set of sentences using poll functions

Week9.
Design UDP Client and server application to reverse the given input sentence

Week10
Design UDP Client server to transfer a file

Week11
Design using poll client server application to multiplex TCP and UDP requests for converting a given text into upper case.

Week12
Design a RPC application to add and subtract a given pair of integers

Reference Book:
1) Advance Unix Programming Richard Stevens, Second Edition Pearson Education
2) Advance Unix Programming, N.B. Venkateswarlu, BS Publication.

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(F0047105) CASE TOOLS LAB

1) The student should take up the case study of Unified Library application which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.

2) Student has to take up another case study of his/her own interest and do the same what ever mentioned in first problem. Some of the ideas regarding case studies are given in reference books which were mentioned in theory syllabus can be referred for some idea.

Note : The analysis, design, coding, documentation, database design of mini project which will be carried out in 4th year should be done in object-oriented approach using UML and by using appropriate software which supports UML, otherwise the mini project will not be evaluated.