SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
(University)

DEGREE OF MASTER OF SCIENCE
IN
COMPUTER SCIENCE & TECHNOLOGY
(FIVE YEARS - INTEGRATED COURSE)

REGULATIONS 2006

CREDIT SYSTEM

1. ELIGIBILITY FOR ADMISSION

Candidates for admission to the first year of the Master of Science in Computer Science & Technology full time degree course shall be required to possess a pass in Higher Secondary Examinations conducted by Government of Tamil Nadu or an Examination accepted as equivalent thereto by the syndicate with Mathematics and Physics.

2. DURATION AND STRUCTURE OF THE PROGRAM

2.1 The minimum period for completion of the M.Sc.(CST) program is TEN semesters and maximum period to complete the M.SC.(CST) program is FOURTEEN semesters.

2.2 The curriculum of M.Sc.(CST) shall be so designed the minimum prescribed credits required for the award of the degree shall be 203 credits.

2.3 If a candidate is unable to continue this course after the sixth semester, he/she will be awarded B.Sc (Computer Science & Technology) provided he/she passed in all subjects uptp VI semester.

Candidates will be required to undertake work on suitable projects in consultation with the Head of the department and Guides. They will submit the report thereon at the end of the X semester.

The candidate's performance in each theory/ practical course excluding Language I & II, English I & II will be evaluated by a combination of continuous internal assessment and University examinations.

Internal Marks	20 Marks
External Marks	80 Marks

For the conduct of University Examinations in practical subjects, the university will appoint two internal examiners for each college. The question paper for the practical examination will be set by the board of Examiners appointed by the university.

For all theory and practical subjects, the duration of University examination will be 3 hours.

2.4 To help the students to take up special research areas in their project work and to enable a department to introduce a new elective in latest / emerging areas in the curriculum, "Special Elective" may be offered. A candidate may be permitted to enroll for a "Special Elective" up to a maximum of 3 credits during the period of his/her study, provided the detailed syllabus of this course is recommended by the Head of the Department through the Head of the institution and approved by the Registrar before the commencement of the semester in which the Special Elective course is offered. However, the detailed syllabus should be got approved by the Board of Studies of the Faculty concerned.

COURSE STRUCTURE

Paper Number	Paper Title	Lecture/ Lab Hours/ Week	Exam Duration Hr	Credit
	I SEMESTER			
CST101	Language I: Tamil/Hindi	5	3	3
CST102	English I	5	3	3
CST103	Maths – I	5	3	3
CST104	Physics	4	3	3
CST105	Digital Computer Fundamentals	5	3	3
CST106	Practical – I (Digital Lab)	3	3	3
CST107	Practical – II (Computer Practice Lab)	3	3	3
	Total Hrs	**30**		**21**
	II SEMESTER			
CST201	Language II: Tamil/Hindi	5	3	3
CST202	English II	5	3	3
CST203	Photonics and Optical Computing Physics	4	3	3
CST204	Introduction to Information Technology	4	3	3
CST205	Problem Solving Techniques	5	3	3
CST206	Programming in C	4	3	3
CST207	Practical – III (C Lab)	3	3	3
	Total Hrs	**30**		21
	III SEMESTER			
CST301	Communication Skills	5	3	3
CST302	Maths – II	5	3	3
CST303	Software Engineering Computer Architecture	5	3	3
CST304	Business Data Processing COBOL Prog.	4	3	3
CST305	Microprocessor and Its Application	5	3	3
CST306	Practical – IV (Cobol Lab)	3	3	3
CST307	Practical – V (Microprocessor Lab)	3	3	3

Paper Number	Paper Title	Lecture/ Lab Hours/ Week	Exam Duration Hr	Credit
Total Hrs		30		21
IV SEMESTER				
CST401	Database Management System	4	3	3
CST402	Data Structures	5	3	3
CST403	Computer Architecture	5	3	3
CST404	System Software	5	3	3
CST405	Object Oriented Programming	5	3	3
CST406	Practical – VI (RDBMS LAB)	3	3	3
CST407	Practical – VII (Data Structures LAB)	3	3	3
Total Hrs		30		21
V SEMESTER				
CST501	Design and Analysis of Algorithm	5	3	3
CST502	Operating System	5	3	3
CST503	Unix Internals	5	3	3
CST504	Computer Graphics	5	3	3
CST505	Visual Programming	4	3	3
CST506	Practical – VIII (Unix and Graphics Lab)	3	3	3
CST507	Practical – IX (Visual Programming Lab)	3	3	3
Total Hrs		30		21
VI SEMESTER				
CST601	Computer Networks	5	3	3
CST602	Internet and Java Programming	5	3	3
CST603	Artificial Intelligence and Expert System	5	3	3
CST604	Object Oriented Analysis and Design	5	3	3
CST605	Management Information System	4	3	3
CST606	Practical – X (Internet & Java Lab)	3	3	3
CST607	Mini Project – I	3	3	5
Total Hrs		30		23
VII SEMESTER				
CST701	Operation Research	5	3	3
CST702	Principles of Programming Language	4	3	3
CST703	Advanced Java Programming	5	3	3
CST704	Web Graphics and Multimedia	5	3	3

Paper Number	Paper Title	Lecture/ Lab Hours/ Week	Exam Duration Hr	Credit
CST705	Group – A Elective	5	3	3
CST706	Practical – XI (Advanced Java Lab)	3	3	3
CST707	Practical – XII (Multimedia Lab)	3	3	3
	Total Hrs	**30**		21
	VIII SEMESTER			
CST801	Unix Network Programming	5	3	3
CST802	Advanced Data Bases	4	3	3
CST803	Principles of Compiler Design	5	3	3
CST804	Group – B Elective	5	3	3
CST805	Group – B Elective	5	3	3
CST806	Practical – XIII (Networking Lab)	3	3	3
CST807	Practical – XIV (Elective Lab)	3	3	3
	Total Hrs	**30**		21
	IX SEMESTER			
CST901	Network Security	5	3	3
CST902	Data Warehousing and Data Mining	5	3	3
CST903	Software Project and Quality Management	5	3	3
CST904	Group – C Elective	5	3	3
CST905	Group – C Elective	5	3	3
CST906	Mini Project – II	5	3	6
	Total Hrs	**30**		21
	X SEMESTER			
CST1001	Project Work	30	3	12
	Total Hrs	**30**		12
	Elective Subjects			
	Group – A Electives			
	TCP / IP Networks	5	3	3
	Decision support system	5	3	3
	Distributed Computing	5	3	3
	Embedded Systems	5	3	3
	Accounting & Financial Management	5	3	3

Paper Number	Paper Title	Lecture/ Lab Hours/ Week	Exam Duration Hr	Credit
	Group – B Electives			
	.NET Framework & C#	5	3	3
	Web Technology	5	3	3
	Component Based Development	5	3	3
	Fault Tolerant System	5	3	3
	Artificial Neural Networks	5	3	3
	E-Commerce	5	3	3
	Software Agents	5	3	3
	Creative Thinking	5	3	3
	System Analysis and Design	5	3	3
	Group- C Electives			
	Parallel Programming	5	3	3
	Client / Server Information System	5	3	3
	Mobile and Wireless Network	5	3	3
	Real time system	5	3	3
	Digital Image Processing	5	3	3
	Virtual Reality system	5	3	3
	Software Testing	5	3	3
	Enterprise Resource Planning	5	3	3
	Special Elective	5	3	3

Total no of Credits : 203

3. PROJECT WORK

3.1. A candidate is permitted to enroll the project work if he/she has earned a minimum of 50% of credits till the end of 8th semester. If the candidate has not earned the required minimum credits he/she has to complete the arrears (atleast to the extent of earning the minimum credits specified) and then enroll for the project work in the subsequent year.

3.2. Project work shall be carried out under the supervision of a qualified faculty in the concerned department.

3.3. The project work shall be pursued for a minimum of 16 weeks during the final semester.

3.4. The project work prepared according to approved guidelines and duly signed by the supervisor(s) and the head of the department shall be submitted to the head of the institution.

3.5. The deadline for submission of final project is 30 calendar days from the last working day of the semester in which the project work/thesis /dissertation is done

3.6. If a candidate fails to submit the project work on or before the specified deadline, he/she is deemed to have failed in the project work and shall re-enroll the same in a subsequent semester.

4. FACULTY ADVISER

During the courses of study, to help the students in planning their courses of study and for general advise on the academic programme, the head of the department of the student will assign a group of students to a faculty of the department, who shall function as faculty Adviser for those students through out their period of study. Such faculty adviser shall advise the students and monitor the courses taken by the students, check the attendance and progress of the students assigned to him/her and counsel them periodically. If necessary, the faculty adviser may also discuss with or inform the parents about the progress of the students.

5. CLASS COMMITTEE

5.1. A class committee consists of teachers of the concerned class, student representatives and a chair-person who is not teaching the class. The functions of the class committee include :

- Solving problems experienced by students in the class room and in the laboratories.
- Clarifying the regulations of the degree programme and the details of rules therein.
- Informing the students representatives the academic schedule including the dates of assessments and the syllabus coverage of each assessment.
- Informing the students representatives the details of regulations regarding the weightage used for each assessment. In the case of practical courses (laboratories/ project work/Seminar etc.,) the breakup of marks for each experiment/exercise/module of work should be clearly discussed in the class committee meeting and informed to the students.
- Analysing the performance of the students of the class after each test and finding the ways and means of solving problems, if any.
- Identifying the weak students, if any and requesting the teachers concerned to provide some additional help or guidance or coaching to such weak students.

5.2. The class committee for a class under a particular specialization is normally constituted by the head of the department. However if the students of different specialization are mixed in a class, the class committee is to be constituted by the head of the institution.

5.3. The class committee shall be constituted on the first working day of any semester or earlier.

5.4. At least two student representatives (usually one boy and one girl) shall be included in the class committee.

5.5. The chair-person of the class committee may invite the faculty Adviser(s) and the head of the department to the meeting of the class committee.

5.6 The Head of the institution may participate in any class committee of the institution.

5.7. The Chair-person is required to prepare the minutes of every meeting, submit the same to the head of the institution with in two days of the meeting and arrange to circulate among the concerned students and teachers. If there are some points in the minutes required action by the management, the same shall be brought to the notice of the management by the head of the institution.

5.8. The first meeting of the class committee shall be held within one week from the date of commencement of the semester, in order to inform the students about the nature and weightage of assessments within the framework of regulations. Two or three subsequent meetings may be held at suitable intervals. During this meeting the student members representing the entire class shall

meaningfully interact and express the opinions and suggestions of the class students to improve the effectiveness of the teaching-learning process.

6. REQUIREMENTS FOR THE COMPLETION OF THE SEMESTER & SUB SEQUENCE SEMESTER

6.1. A candidate who has fulfilled the following conditions shall be deemed to have satisfied the requirements for the completion of a semester.

a) He/She secures not less than 80% of over all attendance in that semester, taking into account the total number of periods in all courses put together attended by the candidate as against the total number of periods in all courses offered during that semester. Condonation of attendance upto 10% is permitted on medical grounds. Relaxation in attendance is permitted upto 10% for students who represent the university in sports and games. The above two relaxations can not be enjoyed concurrently.

b) He/She earns a progress certificate from the head of the institutions for having satisfactorily completed all the courses pertaining to that semester as judged by internal assessment. A student is expected to have scored not less than 35 % in internal assessment.

c) His/Her conduct has been satisfactorily throughout the semester.

6.2. Candidates who do not complete the semester (as per clause 6.1.) will not be permitted to write the end semester examination and are not permitted to go to next semester. They are required to repeat the incomplete semester in the next academic year.

6.3. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

Candidates shall register their names for the First Semester Examination after the admission in the PG Courses.

Candidates shall be permitted to proceed from the First Semester upto Final Semester irrespective of their failure in any of the Semester Examinations subject to the condition that the candidates should register for all the arrear subjects of earlier semesters along with current (sub sequent) Semester subjects.

Candidates shall be eligible to go to subsequent semester, only if they earn, sufficient attendance as prescribed therefore by the Syndicate from time to time.

Provided in the case of candidate earning less than 50% of attendance in any one of the Semesters due to any extraordinary circumstance such as medical grounds, such candidates who shall produce Medical Certificate issued by the Authorised Medical Attendant (AMA), duly certified by the Principal of the College, shall be permitted to-proceed to the -next semester and to complete the course of study. Such candidate shall have to repeat the missed semester by rejoining after completion of final semester of the course, after paying the fee for the break of study as prescribed by the University from time to time.

7. PROCEDURES FOR AWARDING MARKS FOR INTERNAL ASSESSMENT

7.1. Theory Courses

a) For Regularity (scoring 80% and above attendance)		4 Marks
b) For two assignments (equal weightage)		6 Marks
c) For two tests to be conducted (equal weightage)		10 Marks
	Total	20 Marks

7.2 Practical Courses

(a) For Regularity and satisfactory completion of All experiments prescribed for the course		10 Marks
(b) For model examination at the end of the semester		10 Marks
	Total	20 Marks

7.3 Project Work

For the project work the total marks will be 200 comprising of 75 marks for internal assessment, which is taken by conducting three internal reviews (each 100 marks) during the semester by a review committee. The student shall make presentation on the progress made before the committee. The head of the institution shall constitute the review committee for each specialization of study. The total marks obtained in the three assessments shall be reduced to 75 marks and rounded to the nearest integer.

8. REQUIREMENTS FOR APPEARING FOR SEMESTER EXAMINATIONS

A candidate shall normally be permitted to appear for the end semester examination of any semester if he/ she has satisfied the semester completion requirements(vide clause 6) and has registered for examination in all courses of that semester.

9. EXAMINATIONS

9.1 The end semester examinations will ordinarily be conducted during October to December in the odd semesters and during March to May in the even semesters. For all the theory courses question papers will be set by external examiners and valued by external and /or internal examiners.

9.2 All practical examinations including the project work viva voce will be conducted by internal & external examiners appointed by the university.

9.3 The maximum marks for any course (theory and practical excluding project work) will be 100 comprising of 20 marks for internal assessments and 80 marks for the end semester examinations.

9.4 For project work the total will be 200 comprising of 75 for internal assessment and 50 marks for evaluating thesis/project report by the external examiner and 75 marks for the end semester examinations conducted by the thesis viva board consist of HOD, Internal examiner(Guide) and External examiner. In case of HOD being the guide, A senior professor from the department will be the member of the viva board.

10. PASSING REQUIREMENTS

10.1 A candidate, who secures not less than 50% of total marks prescribed for any courses with a minimum of 50 % of the marks prescribed for the end-semester examination shall be declared to have passed in the examination for that course.

10.2 If a candidate fails to secure a pass in a particular course, it is mandatory that he/she shall register and reappear for the examination in that course during the next semester when examination is conducted in that course he/she should continue to register and reappear for the examination till he/she secures a pass. However, the internal assessment marks obtained by the candidate in the first attempt shall be retained and considered valid for all subsequent attempts.

10.3

B.Sc (Computer Science & Technology)

A candidate will be declared to have passed in any subject excluding Language I & II, English I & II (including practicals, project & viva - voce) of study if he/she secures not less than 50% marks, (the continuous assessment and the University Examination, marks put together) provided a minimum of 40% marks is secured in the University Examinations. For Language I & II, English I & II the passing minimum shall be 40% as prescribed for B.Com., / B.C.A. Also he/she should have passed in all the papers till semester VI, as requirement for B.Sc. Degree, if the candidate chooses to discontinue.

A candidate will be declared to have passed in any subject (including practicals, project & viva - voce) of study if he/she secures not less than 50% marks, (the continuous assessment and the University Examinations marks put together) provided a minimum of 40% marks is secured in the university Examinations. Also he/she should have passed in all the papers till semester X.

11. AWARD OF LETTER GRADES

All assessment of a course will be done on absolute marks basis. However for the purpose of the reporting the performance of a candidate, letter grades, each carrying certain points, will be awarded as per the range of total marks (out of 100) obtained by the candidate as detailed below.

Range of total marks	Letter Grade	Grade points
90 - 100	S	10
80 - 89	A	9
70 - 79	B	8
60 - 69	C	7
50 - 59	D	6
0 - 49	U	0
Incomplete	I	0
Withdrawal	W	0

"U" denoted failure in the course

"I" denotes incomplete as per clause 6.1 and hence prevented from writing end semester examination.

"W" denotes withdrawal from the course. After results are declared, Grade sheets will be issued to each student, containing the list of courses enrolled during semester and the grade scored, the grade point average(GPA) for the semester and the Cumulative Grade point average (CGPA) of all courses enrolled from first semester onwards.

GPA is the ratio of the sum of the products of the number of credits of courses registered and the points corresponding to the grades scored in those courses, taken for all the courses, to the sum of the number of credits of all the courses in the semester.

GPA = (C * GP) / C

Where CGPA will be calculated in a similar manner, considering all the courses enrolled from first semester.

12. ELIGIBILITY FOR THE AWARD OF THE MASTER DEGREE

A student shall be declared to be eligible for the award of the M.Sc.(CST) Degree provided if

(i) The students has Successfully completed the course requirements and has passed all the prescribed examinations in all the TEN semester within a maximum period of SEVEN years reckoned from the commencement of the first semester to which the candidate was admitted .

(ii) No disciplinary action is pending against him/her.

13. CLASSIFICATION OF THE DEGREE AWARDED.

13.1 A candidate who qualifies for the award of the degree (vide clause 11) having passed the examination in all the courses in his/her first appearance securing a CGPA of not less than 8.00 shall be declared to have passed the examination in First class with Distinction.

13.2 A candidate who qualifies for the award of the degree having passed the examination in all the courses within Ten semesters from the date of joining for study securing a CGPA of not less than 6.5 shall be declared to have passed the examination in First class.

13.3 All other candidates (not covered in 13.1 &13.2) who qualify for the award of the degree(vide clause 11) shall be declared to have passed the examination in Second class.

13.4 A candidate who is absent in semester examination in a course/ project work after having enrolled for the same shall be considered to have appeared in that examination for the purpose of classification.

13.5 A candidate can apply for revaluation of his/her semester examination answer paper in a theory course, within 2 weeks from the declaration of results, on payment of a prescribed fee through proper application to the controller of the examinations through the Head of the Department. The controller of examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department.

14. Scheme of Examination — Theory — (Maximum 80 Marks)

	Part - A		
To Answer 5 questions (No Choice)	5 x 2 marks	=	10 Marks
	Part - B		
To Answer 5 questions Out of 7 questions	5 x 6 marks	=	30 Marks
	Part - C		
To Answer 4 questions	4 x 10 marks	=	40 Marks
(Either or choice)	Total		80 Marks

Scheme of Examination for Practicals

The external examiner will prepare a question paper on the spot with the help of the question papers supplied by the controller's office of SRM Institute of Science and Technology.

15. TEMPORARY BREAK OF STUDY FROM A PROGRAMME.

a) Candidate is not normally permitted to temporarily break the study. However if a candidate intends to temporarily discontinue the programme in the middle for valid reasons (such as accident or hospitalization due to prolonged ill health) and to rejoin the programme in a later year he/she shall apply to the Head of the Institution in advance but not later than the last date for registering for the final examinations of the year in question. Such applications should be routed through the Head of the department and the Head of the institution stating the reasons for break of study.

b) The candidate permitted to rejoin the programme after the break shall be governed by the rules and regulations in force at the time of rejoining.

c) The duration specified for passing all the courses for the purpose of classification vide(clause 3) shall be increased by the period of such break of

study permitted

d) The total period for completion of the programme reckoned from, the commencement of the first semester to which the candidate was admitted shall not exceed the maximum period specified in clause irrespective of the period of break of study in order that he/she may be eligible for the award of the degree(vide clause 3)

e) If any student is detained for want of requisite attendance, progress and good conduct, the period spent in that semester shall not be considered as permitted 'Break of Study' and clause 10 is not applicable for this case.

16. DISCIPLINE

Every student is required to observe disciplined and decorous behavior both inside and outside the college and not to indulge in any activity which will tend to bring down the prestige of the University/ College. Boys should wear decent dresses. No casual wear like T-shirts or jeans pant is permitted. Girls shall wear decent dresses like Churidars with Thuppattas and sarees.

17. REVISION OF REGULATION AND CURRICULAM

The University may from time to time revise, amend or change the Regulations, scheme of examinations and syllabi as found necessary.

18. AUTHORITY FOR BOARD OF STUDIES

The Board of Studies has the full authority to change the syllabus of 4^{th} and 5^{th} year at the beginning of 3^{rd} year according to IT trend.

19. PROCEDURE IN EVENT OF FAILURE

1. If a candidate fails in a particular subject (other than project work) he / she may appear for the university examination in that subject in subsequent semesters and obtain pass marks.
2. In the event of failure in project work, the candidates will reregister for project work and redo the project work in a subsequent semester and resubmit the dissertation afresh for evaluation. The internal assessment marks will be freshly allotted – in this case.

20. GENERAL CONDIITONS

With the concurrence of the head of the department, a candidate may be permitted to work whole time/part time in industry for the individual project work during the VI and X semesters. In such cases, the work of the candidate will be jointly supervised by a member faculty in the college/ University and by an engineer/ a scientist or a manager (EDP/ INFORMATION SYSTEMS) in the industry who has been approved earlier by the Head of the department concerned as a person qualified to guide the candidate.

CST103 MATHEMATICS-I for MSC(CST)

PURPOSE

To impart to the students, the rudiments of Mathematics so as to enable them to apply the same for their own branch.

OBJECTIVE

To equip the students of Engineering, the knowledge of Mathematics and its applications so as to enable them to apply them for the branch in which they are admitted.

UNIT-I: TRIGONOMETRY

Expansion of $\sin^n \theta$, $\cos^n \theta$ in terms of $\sin \theta$ and $\cos \theta$ - Expansion of $\tan n \theta$ in terms of $\tan \theta$ - Expansions of $\sin^n \theta$, $\cos^n \theta$, $\sinh \theta$ and $\cosh \theta$ in terms of sines and cosines of multiples of 6 - Power series expansion of $\sin \theta$, $\cos \theta$ and $\tan \theta$ - Hyperbolic functions and inverse hyperbolic functions - Logarithm of complex numbers.

UNIT-II : MATRICES

Rank of a Matrix - consistency and inconsistency of a system of m linear equations in `n' unknowns - eigen values and eigen vectors - Cayley-Hamilton theorem - diagonalisation - orthogonal reduction of quadratic forms to canonical forms.

UNIT-III: GEOMETRICAL APPLICATIONS OF DIFFERENTIAL CALCULUS

Curvature - Cartesian and polar coordinates - circle of curvature - involutes and evolutes - envelopes - evolute as envelope of normals.

UNIT-IV: INTEGRAL CALCULUS

Properties of definite integrals - reduction formulae - double integrals - double integrals in polar coordinates - change of order - area as a double integral - triple integrals - volume using triple integrals.

UNIT-V: BETA AND GAMMA FUNCTIONS

Definition of beta, gamma integrals - relation between them - properties - evaluation of definite integrals in terms of Beta and Gamma functions - simple applications.

TEXT BOOK:

1. Venkataraman M. K. - Engineering Mathematics for first year - National Publishing house, 1993.

CST104 PHYSICS

PURPOSE

The purpose of this course is to develop scientific temper and analytical capability in the engineering graduates through learning of physical concepts and their applications in engineering and technology. Comprehension of some basic physical concepts will enable graduates to logically solve engineering problems they would come across due to last developing new technologies in their engineering career.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to : -

- Understand scientific concepts
- Logically explain the concepts
- Apply the concepts in solving engineering problems
- Explain scientifically the new developments in engineering and technology
- Relate industrial developments to developments in the physical phenomena

UNIT-I: ACOUSTICS

Vibrating systems - longitudinal and transverse waves - expression for velocity in solids and fluids - absorption and attenuation of sound waves - Ultrasonics - production - magnetostriction and piezo-electric methods - properties - applications in industry and medicine - acoustics of buildings (elementary ideas).

UNIT-II: ELECTROSTATICS AND ELECTRODYNAMICS

Electric field and potential - Gauss Theorem - proof (coulomb's law) - applications - line charge, hollow cylinder, hollow spherical conductor, solid spherical conductor - electrostatic energy - Divergence and curl of a vector, introduction to Maxwell's equation - derivation - wave equation for electromagnetic waves - propagation in free space.

UNIT-III: LASERS AND FIBRE OPTICS

Lasers - Absorption and emission - Coherence and monochromatism - MASER AND *LASER actions - Three and four level laser systems - mode locking and Q-switching* lasers - He-Ne, C02, Nd: YAG and Ga As lasers - Introduction to Holography - applications of laser in industry, medicine and communication - Fibre optics - Optical fiber - physical structure, basic theory, mode types - Measurement of optical fiber characteristics - application of optical fibers in information technology, communication and sensors (briefly).

UNIT-IV: CRYSTAL PHYSICS

Crystalline and non-crystalline materials - Bravais lattice - crystal systems - symmetry elements - simple crystal structures - packing factor for SC, BCC, FCC and HCP

structures-- Miller indices - imperfection in crystals - Bragg's law - X-ray diffraction methods to study crystal structures.

UNIT-V: NON-DESTRUCTIVE TESTING OF MATERIALS

Liquid penetrant -magnetic particle - eddy current methods - x-ray radiography - fluoroscopy - Gamma ray radiography - ultrasonic scanning methods - ultrasonic flaw detector - thermography

TEXT BOOKS:

1. Arumugam M- Engineering Physics - Anuradha publishers, 1997. 2. Gaur & Gupata, - Engineering Physics - Dhanpatrai & sons, 1986.

REFERENCE BOOKS:

1. Edward Conrad Jordan . - Electromagnetic Waves and Radiating System - (2nd Ed.). - Prentice Hall of India, 1968.
2. Feynman R.P, Leighton R.B., Sands M - The Feynman Lectures on Physics Vol. I, II, III - Narosa Publishing House, New Delhi (1995)
3. Thyagarajan K and Ghatak. AK, - Laser Theory and Applications - Plenum Pub. Corp - 1981.
4. Kao C.K. - Optical Fiber system, Technology, Design and Applications - McGraw Hill, 1983.

CST105 DIGITAL COMPUTER FUNDAMENTALS

PURPOSE

This course provides an excellent introduction to digital concepts and basic design techniques of digital circuits. It features a greatly expanded coverage of microcomputers, bus structures and memory systems.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand
Number systems, Boolean Algebra, Axioms etc., Sequential and Combinational circuits and Digital Integrated Circuits Memory circuits and systems.

UNIT-I: NUMBER SYSTEM

Number System - Conversion from one base to another - Complements - Boolean algebra - Properties of Boolean algebra - Logic gates - Boolean functions- Karnaugh map up to 6 variables - Don't care condition - SOP - POS - Tabulation method.

UNIT-II: FLIP-FLOPS

Sequential logic - RS, JK, D and T Flip-flops - Triggering of flips - State reduction - Excitation tables - Registers - Shift Registers - Counters - Ripple counters - Synchronous counters - Design of counters

UNIT-III: ADDERS & SUBTRACTORS

Adders - Subtractors - Decoders - Encoders - Multiplexer - Demultiplexer - Design of sequential circuits - Binary Parallel Adder - Decimal Adder - Magnitude Comparator - ROM - PLA.

UNIT-IV: ALU

Design of ALU - Status Register - Design of Accumulator.

UNIT-V: COMPUTER DESIGN

Computer Design - System configuration - Computer instructions - Design of computer registers - Design of control - Computer console.

TEXT BOOKS:

1. Morris Mano.M- Digital Logic and Computer Design -PHI - 2002
2. Bartee T.C. - Computer Architecture and Logic design - McGrawHill - 1991

REFERENCE BOOK:

1. Malvino A.P. and Leach D.P.- Digital Principles and Applications - McGrawHill - 1999.
2. Morris Mano.M -Logic and Computer Design Fundamentals - Pearson Education - 2002.

CST106 **PRACTICAL I**

(DIGITAL LAB)

PURPOSE

This course provides the practical training on digital concepts and basic design techniques of digital circuits.

INSTRUCTIONAL OBJECTIVES

- At the end of this course, the student should be able to understand
- Functions of logic gates
- Implementations of logic circuits
- Implementations of Adder, Subtractor and shift registers

LIST OF EXERCISES

I STUDY OF LOGIC GATES

(a) Logic gates using discrete components
(b) Verification of truth table for AND, OR, NOT, NAND, NOR and EXOR gates
(c) Realisation of NOT, AND, OR, EX-OR gates with only NAND gates
(d) Realisation of NOT, AND, OR, EX-OR gates with only NOR GATES

II IMPLEMENTATION OF LOGIC CIRCUITS

(a) Verification of associative law for AND, OR GATES
(b) Karnaugh's map reduction and logic circuit implemenation

III ADDER

(a) Verification of Demorgan's law
(b) Implementation of Half-adder
(c) Implementation of Full-adder
(d) Four bit binary adder

IV SUBTRACTOR

(a) Implementation of Half-subtractor
(b) Implementation of Full-subtractor
(c) Four bit binary subtractor using 1 s and 2s complement

V SHIFT REGISTERS

(a) Implementation of shift register, serial transfer
(b) Ring counter

(c) 4-bit binary counter
(d) BCD Counter
(e) Counters for arbitrary sequence

REFERENCE BOOKS:

1. Morris Mano.M - Digital Logic and Computer Design - PHI - 1994.
2. Bartee T.C. - Computer Architecture and Logic design - McGrawHill - 1991
3. Malvino A.P. and Leach D.P. - Digital Principles and Applications - McGrawHill - 1999.
4. Bhujade - Digital Computer Design Principles - Pitambar M.R., Publishing Co. –

CST107 PRACTICAL II

(COMPUTER PRACTICE LAB)

PURPOSE

It familiarizes the students, the basics of DOS, UNIX and WINDOWS operating systems, MS-Office and database packages.

INSTRUCTIONAL OBJECTIVES

- At the end of this course, the student will be familiar with
- Dos and Windows Platform
- MS-office tools like Word, Power point, Access, excel, etc.,
- Various database packages

LIST OF EXERCISES

I Operating Systems

a) Study of various types of operating system
b) Basic commands of DOS, UNIX and WINDOWS

II Office Automation

a) Word Processing
b) Data Base Management
c) Spread sheet Package
d) Presentation Tools

III Networking

a) Introduction to computer network
b) Internet and Intranet
c) E-mail and charting
d) LAN & WAN

REFERENCE BOOKS:

1. Vikas Gupta - "Comdex - Computer Course Kit" - Wiley dreamtech - 2003.
2. Taxali - PC Software for Windows Made Simple - Tata McGraw Hill - 1999.
3. Nelson - Microsoft Office 97 - Tata McGraw Hill - 1999.

CST203 PHOTONICS AND OPTICAL COMPUTING PHYSICS

PURPOSE

The purpose of this course is to introduce students to the fundamental ideas related with opto-electronics, optical switches and optical computing. Comprehension of some basic physical concepts will enable graduates to logically solve engineering problems they would come across new technologies in their engineering career.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to:

- Integrate the concepts of electronics and optical physics
- Describe the concepts of operation of optical sources and detectors
- Describe the operation of various light modulators
- Logically describe the physics of optical wave guides
- Explore the fundamentals of optical numerical processing

UNIT-I: OPTO ELECTRONICS

PN junction theory - optical absorption in semiconductors - injection luminescence - optical sources (LED and Semiconductor laser) - photo detectors - photo diodes - PN, PIN and hetero structure photo diodes - frequency response of silicon photo diodes - avalanche photo diode (APD).

UNIT-II: GUIDED WAVE OPTICS

Total internal reflection - planar dielectric waveguide - fibre materials - fibre index profiles - modes of propagation - losses in fibres - dispersion - fibre amplifiers - soliton propagation - dense wavelength division multiplexing (DWDM).

UNIT-III: ELECTRO-OPTICS, MAGNETO-OPTICS AND ACOUSTO-OPTICS

Electro-optic effect - Pockels modulator - Kerr modulator - Franz Keldysh and Stark effect modulators - quantum well - P-I (MQW)-N electro absorption modulator - magneto optic modulator - acousto optic modulator.

UNIT-IV: NON LINEAR OPTICS

Optical bistability - Fabry-Perot resonator - self electro-optic effect device (SEED) - Liquid crystal light valve (LCLV) - simple logic gates using LCLV (AND, ex-OR, OR, NOR and NAND) - optical phase conjugation - four wave mixing.

UNIT-V: OPTICAL NUMERICAL PROCESSING

Configuration of a fourier transform of a system of lenses - simple arithmetic - addition, subtraction, multiplication, division, matrix vector multiplication - memory - bit by bit storage elements - optical discs - holographic mass storage - advantages of optical computing.

TEXT BOOKS:

1. John Wilson and John Hawkes - Opto-electronics - An Introduction - Prentice Hall -1998
2. Dror G. Feitelson - Optical Computing - A survey for computer scientists - MIT Press - 1992.

REFERENCE BOOKS:

1. Fowls G.R., Rinehart and Winston - Introduction to Modern optics - 1985
2. Kaminow LP.- An introduction to electro-optic devices - Academic Press, 1975
3. Henisch H.K - Electro Luminescence - Pergamon Press, 1962
4. Senior J.- Optical Fibre Communications- Principles and practice - Pearson Education - 1993

CST204 INTRODUCTION TO INFORMATION TECHNOLOGY

PURPOSE

The purpose of this course is to introduce the students in to the field of computers and information technology.

INSTRUCTIONAL OBJECTIVES:

At the end of the course, student should be able to:

- Classify the types of computers and their applications
- Appreciate the various programming techniques
- Identify the input, output and storage devices
- Understand the Network concepts
- Familiar with database packages

UNIT-I: INTRODUCTION

IT - an Introduction - Information age - Responses - Information Systems - Infrastructure and architecture - IT in organizations, Engineering and Maths - GPS - Types of Computer - Anatomy of a Computer - Foundation of modern IT - CPU - Memory - Buses - Communication with Peripherals - Data Bases - Logic data Models.

UNIT-II: I/O DEVICES

I/O Devices - Text mode and Graphics mode editing - Pointing Devices - Introduction to Modern Output - Display Screens - Printers - Introduction to Modern Storage - Storage Media - Increasing data storage capacities - The Smart Card.

UNIT-III: S/W PACKAGES

S/W Interfaces - Application Programs - OS - Document centric Computing - S/W Issues - Network Computing - Editing Documents - Word Processing - Features - Formatting Documents - Desktop Publishing - Spreadsheet Applications - Database Applications - Queries.

UNIT-IV: NETWORKING

Network Applications - Foundation of Modern Networks - LAN - WAN - Multimedia - Tools of Multimedia - Delivering Multimedia - Multimedia on the Web - Transaction Processing - Management Control - Marketing - Advertising, Sales, Design, Production and Manufacturing - Business on the Internet - Telecom Applications - Internet and Intranet - Operation and services provided - WWW.

UNIT-V: PROGRAMMING BASICS

Programs - Basic concepts of Programming - Programming Techniques - Corporate Development - Computers and Health - Viruses - Computer Crime - Network Protection and security.

TEXT BOOKS:

1. Curtin D.P., Foley. K, Sen K and Morin C, Information Technology-The Breaking Wave- McGraw Hill, 1997.
2. Turban E. et al., - " Introduction to IT " - John wiely and sons, IC, 2000.

REFERENCE BOOKS:

1. Sawyer, Williams and Hutchinson, Using Information Technology - Brief Version, McGrawHill International Edition - 1999.
2. Alexis Leon & Mathews Leon - Fundamentals of Information Technology, - Vikas Publishing House Pvt.Ltd. - 1999.
3. Turban E. et al., - " IT for management : Making connections for strategic Advantages " - John wiely and sons, IC, 2000.
4. Taxali - PC Software for Windows Made Simple - Tata McGraw Hill - 1999. 5. Nelson - Microsoft Office 97 - Tata McGraw Hill - 1999.

CST205 **PROBLEM SOLVING TECHNIQUES**

PURPOSE

This course provides a well-focused introduction to the solution of problems in the aid of computer software. Also provides methods and procedures for text processing, merging, sorting and searching.

INSTRUCTIONAL OBJECTIVES

- At the end of the course, the student should be able to understand
- The Fundamental Algorithms for solving simple problems
- Factoring methods
- Various Array Techniques
- Merging, Sorting and Searching Techniques
- Pattern Searching

UNIT-I: FUNDAMENTAL ALGORITHMS

Exchange the values of two variables - Counting - Summation of a Set of Numbers - Factorial Computation- Sine Function Computation- Generation of Fibonacci sequence - Reversing the digits of an Integer - Base Conversion - Character to Number Conversion.

UNIT- II : FACTORING METHODS

Finding the square root of a number - The smallest divisor of an integer - The greatest common divisor of two integers - Generating Prime Numbers - Computing the Prime factors of an Integer - Generation of Pseudo-random numbers - Raising a number to a large power - Computing n-th Fibonacci number.

UNIT-III: ARRAY TECHNIQUES

Array order reversal - Array counting or Histogramming - Finding the maximum number in a set - Removal of Duplicates from an ordered Array - Partitioning an Array - Finding the kth smallest element - Longest monotone subsequence.

UNIT-IV: MERGING, SORTING AND SEARCHING

The two way merge - Sorting by selection - Sorting by exchange - Sorting by insertion - Sorting by diminishing increment - Sorting by Partitioning - Binary search - Fast searching.

UNIT-V: TEXT PROCESSING AND PATTERN SEARCHING

Text line length adjustment - Left and Right Justification of Text - Keyword searching in Text - Text line editing - Linear pattern search - Sublinear pattern search.

TEXT BOOK:

1. Dromey R.G.- " How to solve it by Computer", PHI - 1992.

REFERENCE BOOKS:

1. Robert L.Kruse - " Data Structures and Program Design" - PHI1 - 1987 2. Kunth - "Fundamental Algorithms" - Narosa Publiching House - 1985.

CST206 **PROGRAMMING IN C**

PURPOSE

The purpose of this course is to introduce the students into the field of programming using C language. The students will be able to increase their analyzing and problem solving ability and use the same for writing programs in C

INSTRUCTIONAL OBJECTIVES

- At the end of the course, student should be able to:
- Write simple programs in C language
- Understand the various file processing and programming techniques
- Appreciate the structures and pointers of C programming language
- Categorize the various input, output and program control statements in C

UNIT-I: INTRODUCTION

Memory concepts - Arithmetics in C - Decision Making- Algorithm - Pseudo code - Control structures - If - If-else - While - Formulating Algorithms - Stepwise refinement - Case studies - Assignment operators - increment and decrement operators.
Program Control: Essential of repetition - For - Do-While - Break - Continue statements - Logical operators.

UNIT-II: FUNCTIONS & ARRAYS

Functions - Library & User defined functions - Function definitions and Prototypes - Header files - Calling Functions - Storage Classes - Scope rules - Recursion - Passing arrays to Functions - Sorting arrays - Searching arrays - Multiple Subscripted arrays.

UNIT-III: POINTERS

Introduction - Pointer variable declarations and Initialization - Pointer operators - Calling functions by reference - Pointer arithmetic - Comparing pointers with arrays - Arrays of pointers -Pointer to function. haracter and String: Fundamentals - Character handling Library - String Conversion functions - String Manipulation functions (i.e.; Comparison, Search, Memory and others) of String Handling Library.

UNIT-IV: FORMATTED I/O

Streams - Formatted output with printf - Printing all types of data - Printing with fields widths and Precisions - Use of flags - Printing literals and escape sequences - Formatting input with scanf. Structures & Unions: Structure definition - Initializing structures - Accessing members of structures - Using structures with functions - Type def - Unions - bitwise operators - Bit fields - Enumeration constants.

UNIT-V: FILE PROCESSING

The data hierarchy - Files and Streams - Operations on sequential access file - Operations on random access file - Case study. The preprocessor: #include preprocessor directive - #define, #error, #pragma preprocessor directives Conditional compilation - The # and ## operators -- Line numbers - Pre defined symbolic constants - Assertions.

TEXT BOOK:

1. Deitel H.M. & Deitel P.J. - "How to Program C" - PHI - 1994.

REFERENCE BOOKS:

1. Manoj Kumar Gupta - "Computer & C Programming" - Wiley dreamtech - 2002.
2. Gottfried B.S.- "Programming with C" - Scham's Outline Series - TMC - 1997
3. Balaguruswamy E.- "Programming in ANSI C" - TMC - 1999.
4. Kanetkar Y - "Let us C" - BPB Pub - 1995.

CST207 **PRACTICAL - III**

(C Lab)

PURPOSE

The purpose of this course is to give practical knowledge in into the field of programming using C language. The students will be able to increase their analyzing and problem solving ability and use the same for writing programs in C

INSTRUCTIONAL OBJECTIVES

- At the end of the course, student should be able to :
- Understand C Programming techniques
- Categorize the various input, output and program control statements in C
- Appreciate the structures and pointers of C programming language
- Understand the various file processing and programming techniques

LIST OF EXERCIES

1. Summation of Series sin(x) & cos(x)
2. Finding prime numbers from 1 to 100.
3. Sorting numbers and alphabets.
4. String Manipulation.
5. Matrix Manipulation.
6. Checking for upper and lower triangular matrix
7. Finding Transpose & Inverse of a Matrix.
8. Finding LCM and GCD of two numbers.
9. Finding NCR values
10. Creating database for Mailing addresses and related operations. Use Structures.
11. Creating database for Web page addresses and related operations. Use Pointers.
12. Creating database for telephone numbers and related operations. Use File Concepts.
13. Sequential File Processing.
14. Random File Processing.
15. Use of Preprocessors.

REFERENCE BOOKS:

1. Deitel H.M. & Deitel P.J. - "How to Program C" - PHI - 1994.
2. Gottfried B.S.- "Programming with C" - Scham's Outline Series - TMC - 1997
3. Balaguruswamy E.- "Programming in ANSI C" - TMC - 1999.
4. Kanetkar Y - "Let us C" - BPB Pub - 1995.

CST301 **COMMUNICATION SKILLS**

PURPOSE

To provide an adequate mastery of technical and communicative English Language training primarily, comprehension, reading and writing skills, secondarily listening and speaking skills.

INSTRUCTIONAL OBJECTIVES

To prepared them for participation in seminars, group discussions, paper presentation and general personal interaction at the professional level.

UNIT-I: COMMUNICATION

Importance of Communication - Elements of good individual communication - organising oneself - different types of communication.

UNIT-II: ORAL COMMUNICATION AND GROUP COMMUNICATION

Features of an effective speech-practice in speaking fluently -paper presentation - role play telephone skills - etiquette

UNIT-III: PUBLIC SPEECH

Short Extempore speeches - facing audience - paper presentation- getting over nervousness- Interview techniques - preparing for interviews - Mock Interview - Body Language.

UNIT-IV: CREATING WRITING

I

a. Scope of creative writing
b. Writing a report / format of the report
c. Oral Report
d. Periodical Report
e. Progress Report
f. Field Report

II Product description - Description of devices & Mechanism

UNIT-V: COMMUNICATION & COMPUNICATION

Communication & Compunication - SoftwarePreparation of minutes - Video conference - Tele conference / Virtual meeting - Impact of internet on

communication-communicate through computers - voice mail - broadcast messages - Internet Relay chat - e-mail autoresponse -FTP etc.

UNIT-VI: ASSIGNMENT AND MINI PROJECT

Assignment and Mini Project Report Writing - Mini Project may be submitted during course work. Based on the test performance and project report of the students marks may be awarded.

TEXT BOOK

1. Effective Communication W.H.Allen London, 1979.
2. Abraham Benjamin Samuel 'Practical Computation' *(Communicative English)* LSRW2000' - SRMEC - June 2002 Edition.

REFERENCE BOOKS

1. Jospeh.D.Andrew, Claire B May of Garden S.May, Effective Writing - A hand book for finance people, Prentice Hall, 1999.
2 Terikival Gamble and Michael Gamble, Communication works, McGraw Hill, 2002

CST302 MATHEMATICS-II for MSC(CST)

PURPOSE

To impart to the students of Engineering, the rudiments of Mathematics so as to enable them to apply the same for their own branch.

INSTRUCTIONAL OBJECTIVES

To equip the students of Engineering, the knowledge of Mathematics and its applications so as to enable them to apply them for the branch in which they are admitted.

UNIT-I : ALGEBRA

Binomial, exponential and logarithmic series (without proof) - problems on summation, approximation and coefficients

UNIT-II: THEORY OF EQUATIONS

Relation between roots and coefficients of polynomials - formation of equation - increasing and decreasing the roots - reciprocal equations - Homer's method to find the roots of the polynomial equations.

UNIT-III: FUNCTIONS OF SEVERAL VARIABLES

Functions of two variables - partial derivatives - total differentiation - Taylor's expansion - maxima and minima of functions of two and three variables - constrained extremum - Lagrange's method - Jacobians .

UNIT-IV : DIFFERENTIAL EQUATIONS

Differential equations of first order and higher degree - higher order differential equations with constant coefficients - variable coefficients - simultaneous equations - method of variation of parameters

UNIT-V :VECTOR CALCULUS

Gradient, divergence and curl - solenoidal and irrotational fields - vector identities - directional derivatives - line integrals - surface integrals - volume integrals. Green's Gauss and Stoke's theorem (without proof) simple problems.

TEXT BOOK:

1. Venkataraman M.K. - Engineering Mathematics for first year - National Publishing house, 1993.

REFERENCE BOOKS:

1. Grewal B.S.- Higher Engineering Mathematics - Khanna Publishers, 1988
2. Veerarajan T - Engineering Mathematics for first year - Tata McGraw Hill Publishing House, 2001.
3. Ramamurthy V and others - Engineering Mathematics for first year – Anuradha Publications, 2002.
4. Kandasamy S and others - Engineering Mathematics for first year S.Chand and Company, 2001
5. Singaravelu A- Engineering Mathematics for first year - Meenatchi publications, 2000.
6. Arumugam. S and others - Engineering Mathematics for first year - Scitech publications, 1998.

CST303 SOFTWARE ENGINEERING

PURPOSE

Though software development exists since the computers entered the fray, the success of software is mainly human based and the steps followed is not unique. Software development did not follow any predefined phases. Therefore software enhancement, reusability of code, application, software debugging etc., were tedious. These drawbacks necessitated the study for predefined proven engineering standards in the development of software.

INSTRUCTIONAL OBJECTIVES

At the end of the course, students will be able to approach the problem in terms of software engineering standards and possess knowledge in the following areas:

- Software Engineering Paradigms
- Software Project Planning and Scheduling
- Software Risk Management and Mitigation
- Software Documentation
- Software Quality Assurance, Reliability of software and Testing

UNIT-I : SE PARADIGMS

Quality and Productivity factors of software - Software myths - Needs and Goals of Software Engineering - Software Engineering Definitions - Elements of Software Engineering - Layered Technology - Software Process - Introduction to CMM and Umbrella Activities - Software Process Paradigms - Types of SDLC, Various Evolutionary and Incremental Models - Combined Paradigms - Comparison and suitability of SDLC - Case Study

UNIT-II : PROJECT PLANNING AND SCHEDULING

Software Project Management Spectrum - Team Organization - Software Metrics and Measures - Process Metrics - Software Project Planning - Empirical- Putnam, COCOMO - Delphi Models - Risk Identification and Projection - RMMM - Project Scheduling and Tracking - PERT, CPM, WBS, GANTT chart - Case Study

UNIT-III : RISK MANAGEMENT AND MITIGATION

System Engineering - Requirement Analysis - Analysis Modeling - Software Design concepts and Principles - Design Methods - Designing Real time Systems - Case Study

UNIT-IV : SOFTWARE MAINTENANCE

Types and Cost Estimation - Lehman's Law, Techniques for reducing need of software maintenance - SCM - SCI - Change control, Version control -

Configuration Audit - Software Re-engineering - Benefits and Activities - Forward and Reverse Engineering - Source code translation - Data Re-engineering - Software Documentation and its purpose - Characteristics and effective of Software documentation - Types of User Documentation - Need for standardization - Role of Process and standards in documentation - On-line Help - Impact of Internet Documentation

UNIT-V : SQA, RELIABILITY AND TESTING

Software Quality Assurance - FTR - Statistical Quality Assurance - McCall's Software Quality factors - FURPS - Software Reliability Engineering - Fault Avoidance, Removal and Tolerance - Software Reliability Metrics - MTTF, MTBF, POFOD, ROCOF – Software Reliability Models - Logarithmic Poisson Model, JM, LV, GO Models - Software Safety and Hazard Analysis - IEC 1508 Safety Standard - Hazard Analysis - FMEA, FTA, ETA - Software Testing Objectives and Principles - Testing Techniques - Testing strategies - Debugging Principles - Testing for specialized environments - Technical Metrics for Software

TEXT BOOKS:

1. Roger S. Pressman - "Software Engineering: A Practitioner Approach" - McGraw Hill - 1999
2. Sommerville I. - "Software Engineering" - Addison Wesley - 1996

REFERENCE BOOKS:

1. Nashib Singh Gill - "Software Engineering" - Khanna publications - 2002.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli - "Fundamentals of Software Engineering - Prentice Hall of India - 1991.
3. Farley - "Software Engineering Concepts" - McGraw Hill - 1985.

CST304 **BUSINESS DATA PROCESSING**

PURPOSE

This course is designed to understand the various data processing concepts. It provides a basic coverage of COBOL programming language and also about various database packages.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to

- Program in COBOL language
- Know about various commercial database packages, spreadsheets and report writers.
- Appreciate various designs of commercial systems
- Process files
- Understand various sorting and indexing techniques.

UNIT-I : INTRODUCTION

Data Processing Concepts - Data Collection and Verification - Files - Master and Transaction Searching - Sorting - Indexing - Indexed Files - Main Frame Computing.

UNIT-II: COBOL INTRODUCTION

Data Names - Arithmetic verbs - Control Structures - Looping structures - Divisions - Sections - RENAMES, REDEFINES, JUSTIFIED and condition name condition statements.

UNIT-III: REPORT GENERATION DESIGN & CODING

Designing and writing control break programs - Debugging and testing - output formatting.

UNIT-IV: FILE AND TABLES

Files - Sequential file - Indexed file - Sorting - Merging - Table Handling - Subroutines - Screen formatting.

UNIT-V: USER INTERFACES

Design of Commercial Systems - User interfaces - Forms - Menus - E-Commerce - M-Commerce - User Interface for Internet base systems.

TEXT BOOKS:

1. Phillppakis A. S. and Kazmir L.J. - Structured COBOL - McGraw Hill - 1999.
2. Chao C. Chin - Introduction to the Microcomputer and Its Applications - Galgotia Publications - 1996.

REFERENCE BOOKS:

1. Roy MX - "COBOL Programming" - TmcGrawHill - 1989.
2. Taxali - PC Software for Windows Made Simple - Tata McGraw Hill - 1999.
3. Nelson - Microsoft Office 97 - Tata McGraw Hill - 1999.
4. Kapoor V.K - Quantitative Techniques,System Analysis and Data Processing - Sultan Sons - 1998.

CST305 MICROPROCESSORS AND ITS APPLICATIONS

PURPOSE

The rationale behind the inclusion of this course is to explore the architectures and system design concepts associated with microprocessors.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- The basic concepts underlying a programmable device such as busses, machine cycles, various processes of data flow, internal register architecture, programming and interfacing
- The capabilities, interfaces and trade-offs in the practical design of microcomputer based system

UNIT-I : INTRODUCTION

Overview of microcomputer structure and operations - Microprocessor evolution and types 8086 internal architecture - Program development steps - Constructing the machine code for 8086 instructions -assembly language programming development tools - Writing programs for Use with an assembler

UNIT-II : PROGRAMMING STRUCTURE IN 8086

Implementing Standard program structures in 8086 assembly language - Strings, Procedure and Macros - 8086 instructions - descriptions and assembler directives - Basic 8086 Microcomputer System - Trouble shooting a simple 8086 based microcomputer.

UNIT-III : INTERRUPTS AND INTERFACING

8086 interrupts and interrupt responses - hardware interrupt application - Software programmable timer/counter - Priority interrupt controller (8259A) - software interrupt application - Interfacing - Microprocessor to key board, Alphanumeric displays - Microcomputer ports to high power devices - D/A converter operations interfacing and applications -A/D converter specifications, Types and Interfacing

UNIT-IV: APPLICATIONS

Microcomputer based industrial process - Control system - Developing the prototype of microcomputer based Instrument - Introduction to Robotics and embedded control , digital signal processing and Digital Filters - DMA- Data transfer -Interfacing and refreshing Dynamic RAM-8087 Math co-processor.

UNIT-V : CASE STUDY

Multiuser/Multitasking Operating system - 80286 microprocessor - 80386 32 bit microprocessor - 386 protected mode operation - 386 virtual 8086 mode operation - 386 programming for MS-DOS based system, MS-Windows Operating system - Intel 80486 microprocessor - Introduction to RISC, Parallel processing.

TEXT BOOK:

1. Douglas V Hall - "Microprocessors and interfacing - Programming and Hardware" - McGraw Hill - 1991.

REFERENCE BOOKS:

1. Yu-Chengh Liu and Gibson - "Micro computer Systems 80886/8088 family" - Prentice Hall - 1986
2. Ray A.K. and Bhurchandi - "Advance microprocessors and Peripherals, Architecture programming and Interfacing" - McGraw Hill International - 2001.

CST306 **PRACTICAL IV**

(COBOL LAB)

PURPOSE

To provide practical training on COBOL programming language. The students are trained the COBOL file processing techniques in detail.

INSTRUCTIONAL OBJECTIVES

- At the end of the course, the student should be able to
- Familiar with COBOL language
- Know the sequential and indexed file processing
- Understand screen formatting and subroutines in COBOL
- Understand various sorting and indexing techniques in COBOL

LIST OF EXERCISES

I SIMPLE PROGRAMS

Program for the understanding of the following

1. Arithmetic Verbs
2. Editor Picture Clauses
3. IF, Nested IF
4. Looping Structure
5. Table Handling

II SEQUENTIAL FILE

Program using Sequential file for the following (Assume Input and Output specifications of your own)

6. Payroll Processing
7. Student Test Grade Report
8. Billing system (Billing for the items of purchase)

III INDEX FILE

9. Searching the address of a telephone number.
10. Updating Master File using the data in the Transaction file (ie; Inventory control, or banking system programs shall be done)
11. Modifying the existing data in an indexed file

IV SORTING & MERGING

12. Sorting a file using single key and multiple key
13. Merging two files

V SUBROUTINES AND SCREEN FORMATTING

14. Program using subroutine (ie; use of linkage section)
15. Screen formatting programs (ie; use of screen section)

REFERENCE BOOKS:

1. Phillppakis A. S. and Kazmir L.J. - Structured COBOL - McGraw Hill - 1999.
2. Roy M.K - "COBOL Programming" - TmcGrawHill - 1989.
3. Stem and Stern Structured COBOL Programming - 1999.

CST307 **PRACTICAL V**

(MICROPROCESSOR LAB)

PURPOSE

The rationale behind the inclusion of this course is to develop the practical knowledge on 8086 microprocessor programming using TASM.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to familiar with :

- Bios and Dos interrupts
- Arrays and recursive functions
- 16 Bits and muti bits arithmetic operations
- Files and directory operations

LIST OF EXERCISES

I INTRODUCTION

(a) Bios and Dos services
(b) Function Numbers
(c) Dos Interrupts
(d) Bios Interrupts
(e) Program format and development tools

II ARITHMETIC OPERATIONS

(a) Addition and Subtraction
(b) Multiplication and Division

III ARRAYS

(a) Largest in an array
(b) Sorting and Searching

IV FILE AND DIRECTORY OPERATION

(a) Create a file
(b) Rename a file
(c) Get file size
(d) Create a subdirectory
(e) Remove a directory

V BIOS INTERRUPTS

(a) Clear the screen
(b) Keyboard Status
(c) Printer Status
(d) Print a message using printer
(e) Moving the string in CRT

VI PROGRAM USING RECURSION

(a) Computation of Factorial
(b) Computation of NCr
(c) Generation of Fibonacci

REFERENCE BOOKS:

1. Ray A.K. and Bhurchandi - "Advance microprocessors and Peripherals, Architecture programming and Interfacing" - McGraw Hill International - 2001.
2. Douglas V Hall - "Microprocessors and interfacing - Programming and Hardware" - McGraw Hill - 1991.
3. Yu-Chengh Liu and Gibson - "Micro computer Systems 80886/8088 family" - Prentice Hall – 1986

CST401 DATABASE MANAGEMENT SYSTEM

PURPOSE

The purpose of this course is to impart knowledge on database management system to the students and to design, build and run a modern database applications.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Understanding the areas of database design, SQL and programming
- Understanding relational database technology for building applications for the current trend
- Evaluate a business situation and designing & building a database applications

UNIT-I : INTRODUCTION

Definition - Purpose of Database systems - Class Diagrams - Data Types - Events - Normal Forms - Integrity - Converting Class Diagrams to Normalized Tables - Data Dictionary.

UNIT-II: RELATIONAL MODEL

Relational Model: Relational Algebra - Relational Calculus - DDL - DML - DCL - Sub Queries - Joins - Views - GROUP BY command - Aggregate operators. Query Processing : Query interpretation - Equivalence of Expression - Query Processing cost - Query Optimizer.

UNIT-III: HIERARCHICAL MODEL

Parent child relationships - Tree structure diagrams - Data definition and manipulation - Virtual records.

UNIT-IV: NETWORK MODEL

Structure sets - DBTG system - data retrieval - update and set processing

UNIT-V: DB ADMINISTRATION

Database Administration - Development Stages - Application types - Backup and Recovery - Security and Privacy - Distributed Databases - Client / Server Databases - Web as a Client/Server system - Object Oriented Databases - Integrated Applications

TEXT BOOKS:

1. Henry F. Korth and Abraham Silberschatz - Database system concepts - McGraw Hill Publications 1999.
2. Gerald V. Post - Database Management System - Designing and building business Applications - McGraw Hill - 1998.

REFERENCE BOOKS:

1. Jeffrey D. Ullman - Principles of database Systems - Galgotia Publishers - 1988.
2. Date C.J.- An introduction to database systems - Narosa - 1985.
3. Ragu Ramakrishnan - Database Management Systems - WCB/McGraw Hill - 1998.

CST402 **DATA STRUCTURES**

PURPOSE

The purpose of this course is to impart knowledge on various data structure concepts to the students.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Several data structure concepts like stacks, queues, linked list, trees and files
- Applications of data structures
- Problem solving using data structure tools and techniques

UNIT-I : INTRODUCTION TO DATA STRUCTURES

Definitions of Data Structure and Algorithm. Performance Evaluation of an Algorithm - Time and Space complexity - Abstract data types - Recursion - Simple examples on recursion. Arrays - Ordered lists, representation of arrays - Sparse matrices.

UNIT-II : STACKS AND QUEUES

Fundamentals and operations - Evaluation of Expressions -conversion of one expression into another. Linked Lists - Singly Linked List - Doubly Linked List - Circular Linked List - Linked stacks and Queues. Storage Pool - Garbage collection and compaction - Data representation on Strings - Pattern matching on strings - Operations on Polynomials using Linked Lists.

UNIT-III : TREES

Tree and Binary tree Representations - Traversals - Threaded Binary tree - Binary tree representation on Trees - Application of trees - Counting Binary trees - Huffinan's Algorithm. Graphs - Definitions and Terminology - Graph Representations - Traversal - Depth First Tree - Breadth First Tree - Spanning Tree - Kruskal and Prims Algorithm -- Single Source Shortest Path - Dijkstra Algorithm.

UNIT-IV :SORTING AND SEARCHING

Internal Sorting - Selection, Quick and Heap Sort.
External Sorting - Sorting with Disks and Tapes.
Searching - Linear and Binary Search - Binary Search Trees - AVL Tree - Splay Trees.

UNIT-V :FILES

Sequential, Indexed Sequential and Direct Files - Multiple Key Access - Hashing techniques.

TEXT BOOKS:

1. Ellis Horowitz & Sartaj Sahani - "Fundamentals of Data Structures in C ++ " - W.H. Freeman and Co. - 1992.
2. Jean Paul Tremblay & Paul Sorenson - "An Introduction to Data Structures with Applications" - TMH - 1984.
3. Leendert Ammeral - "Algorithms and Data structures in C++" - Wiley dreamtech -2003.

REFERENCE BOOKS:

1. Mark Allen Weiss - "Data Structures and Analysis in C" - Pearson Education Pubs. - 1994.
2. Aho, Hopcroft, Ullman - "Data Structures and algorithms" - Pearson Education - 2000.
3. Aaron M. Tenenbaum, Yedidyah Langsam & Moshe J. Augenstein - "Data Structures Using C" - Pearson Education - 1990.

CST403 **COMPUTER SYSTEM ARCHITECTURE**

PURPOSE

This course covers the basic computer system architecture. The student will understand the arithmetic operation techniques, Memory Access and Processor techniques.

INSTRUCTIONAL OBJECTIVES

- At the end of the course, student should be able to understand :
- General Register and Stack Organization
- Pipeline control
- I/O Organization
- Parallel Processing

UNIT-I: INTRODUCTION

Central Processing Unit : General Register and Stack Organization - Instruction Formats - Addressing Modes - Data Transfer and manipulation - Program Control - RISC - CISC.

UNIT-II: PIPELINING

Pipeline control - Vector Processing - Array Processors - Micro-programmed control.

UNIT-III: ARITHMETICS

Fixed point Arithmetic - floating point and decimal arithmetic operations.
UNIT-IV: I/O ORGANIZATION
Input-Output Organization - Peripheral devices - I/O interface - Asynchronous Data Transfer - Modes of Transfer - Priority Interrupt - DMA - I/O processor - Serial Communications.

UNIT-V: MEMORY ORGANIZATION

Memory technology - memory systems - Cache - Parallel Processing - Interconnections structures - Interprocessor arbitration.

TEXT BOOKS:

1. Mano M.M.- "Computer system architecture" - PHI - 1992.
2. Hayes J.P -"Computer Architecture and Organization" - McGraw Hill - 2002

REFERENCE BOOKS:

1. David A. Patterson & John L. Hennessy - "Computer Architecture - A quantitative approach" - Morgan Kaufmann Publishers, 2002.

2. Vincent P. Heuring & Harry F. Jordan - "Computer systems design and architecture" - Addison Wesley Publishing Co. - 1999

CST404 **SYSTEM SOFTWARE**

PURPOSE

In addition to application software, the students will be introduced to the very powerful system software programming. They will be able to appreciate and understand the working of assemblers, loaders, linkers, macro processors and compilers.

INSTRUCTIONAL OBJECTIVES:

At the end of the course, student should be able to:

- Classify various system software machine architectures like RISC, CISC etc.
- Write assembly language programs
- Design compilers, linkers and loaders
- Gain knowledge about various editors, debuggers and system software tools
- Implement macros, parsers and various code generation techniques.

UNIT-I : INTRODUCTION

Introduction - System software - Machine Architecture -SIC/XE machine Architecture CISC machines - VAX Architecture - Pentium Pro Architecture -RISC machines UltraPARC Architecture - PowerPC Architecture - Cray T3E Architecture.

UNIT-II : ASSEMBLERS

Elements of Assemble Language Programming - statement format - Assembly language statements - Basic Functions - Machine Dependent Assembler features - Machine Independent Assembler features - Assembler Design Options - One pass Assemblers - Multi pass Assemblers - Implementation Examples.

UNIT-III: LOADERS AND LINKERS

Basic Functions - Design of an Absolute Loader - Bootstrap loader - machine dependent loader features - machine independent loader features -- loader Design Options - Implementation Examples.

UNIT-IV: MACRO PROCESSORS

Basic Functions - Macro Parameters - Unique labels - Conditional Macro Expansion - Keyword Macro parameters - Macro processor design options - Recursive Macro Expansions - General Purpose Macro processors - Implementation Examples.

UNIT-V: COMPILERS AND UTILITIES

Introduction to compilers - Different phases of the compiler - Lexical Phase - Syntax Phase - Interpretation Phase - Assembly phase - Scanning - Parsing - Code Generation

Techniques - System software tools - Editors - Debuggers - Programming Environments - User Interfaces - Interpreters.

TEXT BOOK:

1. Leland L. Beck - "System software - An Introduction to Systems Programming" - Addison Wesley - 1996.

REFERENCE BOOKS:

1. Dhamdhere D.M.- "Systems Programming and Operation Systems" - TMH - 1996.
2. John J. Donavan - "Systems Programming" - McGraw Hill. - 1972
3. Alferd V. Aho, Jeffrey D. Ullman - "Principles of Complier Design" - Narosa Publishing House - 1987.

CST405 **OBJECT ORIENTED PROGRAMMING**

PURPOSE

Introduction to Object Oriented concepts and programming is the purpose of this course. To learn the structural programming in c++ and to implement all the concepts of OOP using C++.

INSTRUCTIONAL OBJECTIVES:

At the end of the course, student should be able to:

- Get an idea of Class and Objects
- Overload several operators, functions and constructors
- Inherit the properties from the base class
- Handle exceptions

UNIT-I : INTRODUCTION

Introduction to OOP - Basic Concepts of OOP - Applications of OOP. Introduction to C++ - C++ stream I/O - declarations in C++ - Creating New data types in C++ - function Prototypes - Inline functions - Reference Parameters - Const Qualifier - Dynamic memory allocation - default arguments - Unary Scope resolution operator - Linkage specifications - Function template.

UNIT-II : CLASSES AND DATA ABSTRACTION

Introduction - Comparing class with Structure - Class Scope - Accessing Members of a class - Constructor - Destructor - Const objects - Const member functions - Friend class - Friend function - This pointer - Data abstraction and Information hiding - container classes and Iterators.

UNIT-III : OVERLOADING & INHERITANCE

Operator Overloading - Fundamentals - Restrictions - Overloading stream - Insertion and stream extraction operators - Overloading unary & binary operators - Converting between types - Overloading ++ and --. Inheritance - Introduction - Protected members - Casting base class pointers to derived class pointers - Overloading Base class members in a Derived class - Public, Protocols and Private inheritance - Direct base classes and Indirect Base Classes - Using Constructors and Destructors in Derived classes - Implicit Derived class object to base class object conversion.

UNIT-IV : VIRTUAL FUNCTIONS AND POLYMORPHISMS

Introduction - Type fields and switch statements - Virtual functions - Abstract base classes and concrete classes - Polymorphism - Dynamic binding - Virtual destructors. C++ Stream I/O: Streams - Stream Input - Stream Output - Unformatted I/O - Stream manipulators - Stream format states - Stream error - States.

UNIT-V : TEMPLATES & EXCEPTION HANDLING

Templates - Function templates - Class templates - Overloading template functions - Class template and non type parameters - Templates and inheritance - Templates and friends - Templates and static members. Exception handling: When exception handling - Basic of C++ exception - Catching an exception - reth rowing an exception - exception specifications - Constructors, destructor and exception handling - Exception and inheritance.

TEXT BOOK:

1. Deitel H.M. & Deitel P.J. - "How to Program C++" - PHI - 2002. 2. A1 stevenes - "C++ Programming" - Wiley dreamtech - 2003.

REFERENCE BOOKS:

1. Stanley Lippmann, Josee Lajoie - "C++ Primer" - Addison Wesley - 1998.
2. Robert Lafore -" Object Oriented Programming in Microsoft C++" - Wait Group - 1992.
3. Bruce Eckel - "Thinking C++" - PHI - 1995
4. Marshall Cline, Greg Lomow, Mike Girou - "C++ FAQS" - Addison Wesley - 1998

CST406 **PRACTICAL VI**

(RDBMS LAB)

PURPOSE

The purpose of this course is to impart practical knowledge on database management system concepts to the students and to design, build and run a modern database applications.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Understanding the areas of database design, SQL and programming
- Understanding relational database technology for building applications for the current trend
- Evaluate a business situation and designing & building a database applications Table design (With foreign key links), Data normalization, Menu-driven Query processing, Input-screens with necessary validations and Reports should be used.

1. Practice SQL Data Definition Language Commands

a) Table creation and alteration (include integrity constraints such as primary key, referential integrity constraints, check, unique and null constraints both column and table level)
b) Other database objects such as view, index, cluster, sequence, tablespace, snapshot and synonym creation

2. Practice SQL DML commands
Row insertion, deletion and updating
b) Retrieval of data
(i) Simple select query
(ii) Select with Where options (must include all relational and logical operators)
(iii) Functions : Numeric, Date, Character , Conversion and Group functions with having clause
(iv) Set operators
(v) Sorting data
(vi) Sub query (returning single row, multiple rows, more than one column, correlated sub query)
(vii) Joining tables (simple join, self join, outer join)

3. Practice TCL commands (grant, revoke) and save point and restore options
4. Usage of triggers
5. Practice PL/SQL (control statements, looping structure, exception handling, cursor options, procedures, functions, package)

6. Embedded SQL Programs
   (a) SQL Forms (Front end validations, Master- details forms)
   (b) SQL Reports

7. Using any one of the front end and Back end as oracle develop the following
   a) Library information system
   b) Student Mark sheet Processing
   c) Telephone Directory
   d) Gas booking and delivering system
   e) Electricity Bill Processing
   f) Bank Transaction
   g) Pay roll Processing
   h) Election processing system
   i) Computerized Quiz
   j) Tourist Information system

REFERENCE BOOKS:

1. Elmashri R & Shamkant B. Navathe - Fundamentals of Database System - Pearson Education - 2000.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan - Database System Concepts - Tata McGraw Hill - 1999.
3. Ragu Ramakrishnan - Database Management Systems - WCB/McGraw Hill-1998.
4. Date C.J. - An Introduction to Database - Addison Wesley - 2003
5. Gerald V. Post - Database Management System - Designing and building business Applications - McGraw Hill - 1999
6. Jeffrey D. Ullman - Principles of Database Systems - Galgotia Publishers - 1988.

CST407 **PRACTICAL VII**

[DATA STRUCTURES LAB]

PURPOSE

The purpose of this course is to impart practical knowledge on various data structure concepts to the students.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Several data structure concepts like stacks, queues, linked list, trees and files • Applications of data structures
- Problem solving using data structure tools and techniques

Note : All the Experiments shall be done using C++

LIST OF EXPERIMENTS

1. ARRAYS
Sparse Matrix Manipulation

2. STACKS AND QUEUES
   a) Stack operations using array and pointers
   b) Queue operations using array and pointers
   c) Conversion of infix to postfix
   d) Evaluation of Expressions

3. LINKED LISTS
   a) Singly Linked List
   b) Doubly Linked List
   c) Circular Linked List
   d) Linked Stacks.
   e) Linked Queues
4. TREES
   a) Binary Tree Traversals
   b) Threaded Binary Tree
   c) AVL Tree
5. SORTING
   a) Selection Sort
   b) Heap Sort
   c) Quick Sort

BOOKS FOR REFERENCE:

1. Ellis Horowitz & Sartaj Sahani - "Fundamentals of Data Structures in C "- W.H. Freeman and Co. - 1992.
2. Jean Paul Tremblay & Paul Sorenson - "An Introduction to Data Structures with Applications" - TMH - 1984.
3. Leendert Ammeral - "Algorithms and Data structures in C++" - Wiley dreamtech -2003.
4. Mark Allen Weiss - "Data Structures and Analysis in C" - Pearson Education Pubs. - 1994.
5. Aho, Hopcroft, Ullman - "Data Structures and algorithms" - Pearson Education - 2000.

Semester V

DESIGN AND ANALYSIS OF ALGORITHMS

CST501

Objective of the course: This course gives insight into the design and analysis for selected problems.

Unit 1: Introduction - Definition of Algorithm – pseudocode conventions – recursive algorithms – time and space complexity –big-"oh" notation – practical complexities – randomized algorithms – repeated element – primality testing - Divide and Conquer: General Method - Finding maximum and minimum – merge sort.

Unit 2: Divide and conquer contd. – Quicksort, Selection, Strassen's matrix multiplication – Greedy Method: General Method –knapsack problem - Tree vertex splitting - Job sequencing with dead lines – optimal storage on tapes.

Unit 3: Dynamic Programming: General Method - multistage graphs – all pairs shortest paths – single source shortest paths - String Editing – 0/1 knapsack. Search techniques for graphs – DFS-BFS-connected components – biconnected components.

Unit 4: Back Tracking: General Method – 8-queens - Sum of subsets - Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method - Traveling Salesperson problem.

Unit 5: Lower Bound Theory: Comparison trees - Oracles and advisory arguments - Lower bounds through reduction - Basic Concepts of NP-Hard and NP-Complete problems.

1. Recommended Texts

(i) E. Horowitz, S. Sahni and S. Rajasekaran, 1999, Computer Algorithms, Galgotia, New Delhi.

2. Reference Books

(i) G. Brassard and P. Bratley, 1997, Fundamentals of Algorithms, PHI, New Delhi.

(ii) A.V. Aho, J.E. Hopcroft, J.D. Ullmann, !974, The design and analysis of Computer Algorithms, Addison Wesley, Boston.

(iii) S.E.Goodman and S.T.Hedetniemi, 1977, Introduction to the Design and Analysis of algorithms, Tata McGraw Hill Int. Edn, New Delhi.

3. Website, E-learning resources

http://www.cise.ufl.edu/~raj/BOOK.html

CST502 **OPERATING SYSTEM**

PURPOSE

This course will cover the tradeoffs that can be made between performance and functionality during the design and implementation of an operating system. Particular emphasis will be given to three major OS subsystems: process management processes, threads, CPU scheduling, synchronization, and deadlock, memory management segmentation, paging, swapping, file systems.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand:

- Various Scheduling techniques
- Storage and Management concepts
- Page replacement Algorithms
- Deadlock detection, avoidance and recovery

UNIT-I : INTRODUCTION

Introduction-What is an OS-OS structures-Process management-Process conceptProcess scheduling-Operation on processes-Co-operating processes-Threads-Inter process communication.

UNIT-II: SCHEDULING

CPU scheduling - Basic concepts - Scheduling criteria - scheduling algorithms - process synchronization - The critical section problem-semaphores - classical problems of synchronization - monitors -synchronization in Solaris.

UNIT-III : STORAGE MANAGEMENT

Storage management - Memory management - Logical Vs Physical address space - Swapping - Contiguous allocation - Paging - Segmentation - Virtual memory - Demand paging - Page replacement - Page replacement algorithms - Thrashing.

UNIT-IV: DEADLOCKS, PROTECTION AND SECURITY

Deadlocks - Deadlock characterization - Preventions - Deadlock avoidance. Detection recovery from Deadlock - Protection and security : Protection - goals of protection - Domain of protection - Security -Security problem authentication - Encryption.

UNIT-V: FILE SYSTEM INTERFACE

File system interface-file concept-access methods-directory structure-protection-file system implementation- I/O systems-secondary storage section-disk structure-disk scheduling-disk management-disk reliability-Case study-UNIX and Windows NT system.

TEXT BOOK:

1.Silberschatz Galvin - "Operating system concepts" –5th Edition - John Wiley & Sons-2001.

REFERENCE BOOKS:

1. Milan Milenkovic - "Operating System Concepts and Design" - McGraw Hill - 1992.
2. Andrew S. Tennenbaum - "Modern Operating System" - PHI - 2001.
3. Deital - "An Introduction to Operating S
ystem" - Pearson Education - 2002.

CST503 **UNIX INTERNALS**

PURPOSE

This course is to offer knowledge about unix file system, shell programming and device drivers.

INSTRUCTIONAL OBJECTIVIES

At the end of the course, the students should be able to :

- Understand unix file system and process control operations
- Write shell scripts for various applications
- Write unix device drivers and the operation of the unix kernel that is practical and accessible.

UNIT-I : INTRODUCTION TO UNIX

Commands - filters - I/O redirection - file permissions - editors - shell programming - Unix system structure - Kernel - kernel Architecture and data structure.

UNIT-II: FILE SYSTEM

Buffer cache - Buffer headers - Retrieval of a buffer - reading and writing disk blocks - Internal representation of files - Inodes - directories - blocks - file types - Various system calls for file system.

UNIT-III: PROCESSES

Process status and transitions - context - address space - process control operations process scheduling - system calls for time and clock.

UNIT-IV: DEVICE DRIVERS

Introduction - purpose - controllers - overview of block and character devices Routines within a device drivers - Guidelines for writing device drivers.
Simple character device drivers : Kernel interface - Transferring data between user & device driver and device & device driver - Mechanism to schedule execution of device drivers - parallel printer driver.

UNIT-V: MORE ON DEVICE DRIVERS

Interrupts - arrival of interrupts in a device driver - XXintr routine - sleepk and wakeupk - line disciplines 0 and serial device drivers - Introduction to streams, Block device drivers and raw device drivers.

TEXT BOOKS:

1. Maurice J. Bach - "The design of the Unix operating system" - PHI - 1999.
2. Peler Kettle and Steve Statler - "Writing Device drivers for SCO Unix - A Practicla Approach" - Addison Wesley - 1993.

REFERENCE BOOKS:

1. Leffler S.J., McKusick M.K., Karels M.J. and Quaterman J.S. - "The Design and Implementation of the 4.3. BSD Unix Operating System" - Addison Wesley - 1998.
2. Goodheart B., Cox.J. - "The magic Garden Explained" - PHI - 1994.
3. Chirstopher Vickery - "Unix Shell Programmer's interactive workbook" - PHI - 1998

CST504 COMPUTER GRAPHICS

PURPOSE

The purpose of this course is to impart knowledge on computer graphics to the students from the basics and to motivate the students to develop applications using computer graphics.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Understand Graphical User Interface Concepts
- Understand the applications Data Visualization, motion pictures, music video, television pictures and many other applications
- Incorporate physics principles into 3D graphics algorithms
- Know image processing techniques
- Develop Graphics packages like GKS Graphical Kernel System, PHIGS Programmer's Hierarchical Interactive Graphics Standard, and a variety of painting, drawing and design packages

UNIT-I : GRAPHICS SYSTEM AND OUTPUT PRIMITIVES

Graphics applications - Video display devices - Raster scan systems - Random scan systems - I/O devices - Graphics software - O/P primitives : Points and Lines - Line drawing algorithm - Circle and Ellipse generating algorithms - Filled area Primitives - Character Generations.

UNIT-II: 2D TRANSFORMATIONS AND VIEWING

Translation - Rotations - Scaling - Reflection - Shearing - Matrix representations - Composite transformation - Viewing : Viewing Pipeline - Window to Viewport coordinate transformation - Line Clipping algorithm - Polygon Clipping algorithms.

UNIT-III: STRUCTURES, MODELING AND INTERACTIVE INPUT METHODS

Structure concepts - Modeling Concepts - Modeling transformations - The user dialogue - Input of graphical data - Input functions - Interactive picture construction techniques - Virtual reality environments - Segments: Segment Table - Segment Creation, closing, deleting and Renaming.

UNIT-IV: 3D TRANSFORMATION AND VIEWING

Translation - Rotation - Scaling - Reflection - Shearing - Composite transformations - Viewing Pipeline - Viewing coordinates - Parallel and Perspective Projections - View volumes - Clipping.

UNIT-V: VISIBLE SURFACE DETECTION METHODS

Back-Face detection - Depth-Buffer method - Scanline method - Depth sorting method - Area subdivision method - Basic illumination models - Polygon - Rendering methods - Color models - Design of animation sequences - Key frame systems - Morphing - Motion specifications - Bezier Curves.

TEXT BOOK:

1. Donald Hearn & Pauline Baker - Computer Graphics - PHI - 1994.

REFERENCE BOOKS:

1. Foley J.D, Van Dam A, Feiner S. K, Hughes J. F - Computer Principles and Practice - Addison Wesley Publications - 1993
2. Steven Harrington - Computer Graphics - McGraw Hill - 1986
3. Newman W.M. & Sproull R.F. - Principles of Interactive Computer Graphics - International student Edition - McGraw Hill - 1979.

Semester V

VISUAL PROGRAMMING

CST505

Objective of the course	This course introduces the basic concepts of Visual Programming.

Unit 1: Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

Unit-2: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

Unit 3: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.

Unit-4: VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

Unit-5 : Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop

1. Recommended Texts

(i) Gary Cornell, Visual Basic 6 from the Ground up, Tata McGraw-Hill, 1999.

(ii) Noel Jerke, Visual Basic 6 (The Complete Reference), Tata McGraw-Hill, 1999.

2. Reference Books

(i) B. Siler and J. Spotts, Special Editor using Visual Basic 6, PHI, 2001.

CST506 **PRACTICAL VIII**

(Unix & Graphics Lab)

PURPOSE

This course is to offer practical knowledge in unix and shell programming techniques and also in computer graphics.

INSTRUCTIONAL OBJECTIVIES

At the end of the course, the students should be able familiar with :

- Unix commands
- Shell scripts for various applications
- Graphics primitives like generation of circle, line, etc.,
- 2D and 3D transformations
- Clipping and windowing

LIST OF EXERCISE

I UNIX & SHELL PROGRAMMING

1. Basic commands
2.Filters - grep family, cut, dd and sort
3. awk programming
4. Piping
5.Shell Programs

a Programs for the use of the following
  i) if & nested if
  ii) case
  iii) loop structures - while & for
b Implementing Which command
d Catching interrupts
e Find and replace a text
d Command line arguments

II GRAPHICS EXPERIMENTS

1. Output Primitives
   a Bresenhaum's Algorithms for drawing line, circle & ellipse
   b Graphics Primitives - Line, Circle & Box
2. Transfermation, Clipping and Windowing
   a 2D Transformations
   b 3D Transformations
   c Clipping and Windowing

REFERENCE BOOKS:

1. Maurice J. Bach - "The design of the Unix operating system" - PHI - 1999.
2. Chirstopher Vickery - "Unix Shell Programmer's interactive workbook" - PHI - 1998.
3. Donald Hearn & Pauline Baker - Computer Graphics - PHI - 1994.

Semester V

PRACTICAL IX

(VISUAL PROGRAMMING LAB)

CST507

Objective of the course: This course gives training in design and implementation of data bases for the selected problems.

Create database and performing the operations given below using a Menu Driven Program : (a) Insertion, (b) Deletion, (c) Modification, (d) Generating a reports (Simple) for the following System using Visual Basic as a Frontend and Oracle as a Backend :

1. Payroll
2. Mark Sheet Processing
3. Savings Bank Account for Banking
4. Inventory System
5. Invoice System

6. Library Information System

7. Student Information System

8. Income Tax Processing System

9. Electricity Bill Preparation System

10. Telephone Directory Maintenance.

CST601 **COMPUTER NETWORKS**

PURPOSE

The rationale behind the inclusion of this course is to import knowledge on computer communication and networking concepts to the students.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- The seven layers of OSI model
- How do computers and terminals actually communicate with each other
- How to understand the many parts of a communication network and how they fit together

UNIT-I : INTRODUCTION

Uses of Computer Networks - Network Structure, Architecture - Topology - Categories of Network - OSI reference model - Services - Network standardization - Example of networks. The Physical layer : The theoretical basis for data communication - Transmission media Analog transmission - Digital transmission. Transmission and Switching - ISDN - Terminal handling.

UNIT-II : DATA LINK AND NETWORK LAYERS

The Data link layer : The Data link layer design issues - Error detection and correction - Elementary data link protocol - Sliding window protocol - Protocol performance - Protocol specification and verification - Examples of Data link layer. The Network layer : The Network layer design issues - Routing - Routing algorithms - Congestion control algorithms - Internetworking - Examples of network layer.

UNIT-III : TRANSPORT, SESSION & PRESENTATION LAYERS

The Transport layer : The transport layer design issues - Connection management - A simple transport protocol on top of X.25 - example of transport layer. The Session layer : Session layer design issues - Remote procedure call - examples of the session layer. The Presentation layer : Presentation layer design issues - Data compression techniques - cryptography - examples of presentation layer. The application layer : Application layer design issues - file transfer, Access and management - Electronic mail - Virtual terminals - other applications - examples of application layer.

UNIT-IV: ATM

Design goals - ATM architecture -Switching - Switch Fabrics - ATM layer - Service classes - ATM applications. LAN: Local Area Network - Queuing theory -LAN access techniques - Networking and Internetworking devices.

UNIT-V: WIRELESS AREA NETWORK

Wireless communication - Basics - Standards - needs - Applications. TCP/IP suite Part -I - Overview of TCP/IP - Network layer - Addressing - Subnetting - Other protocols in the network layer - Transport layer. TCP/IP suite Part -II Application layer -Client server model - Bootstrap protocol and Dynamic Host Configuration Protocol(DHCP) - Domain Name System(DNS)-TELNET - File Transfer Protocol (FTP) - Trivial FTP - Simple Mail Transfer Protocol(SMTP) - Simple Network Management Protocol(SNMP) - Hyper Text Transfer Protocol(HTTP) - World Wide Web (WWW)

TEXT BOOK:

1. Andrew S. Tanenbaum - "Computer Networks" - Prentice Hall PTR - 2002.

REFERENCE BOOKS:

1. Behrouz & Forouzan - "Intro. To Data Communication and Networking" - McGraw Hill - 2002.
2. Arne Mikalsen , Per Borgesen - "Local Area Networks : Management, Design and security" - Wiley dreamtech - 2002.
3. Peter T. Davis et. al. - "Wireless local area networks" - McGraw Hill - 1995 4. William Stallings - "Data and Computer Communications" - PHI - 1997.

CST602 **INTERNET AND JAVA PROGRAMMING**

PURPOSE

Internet concepts and Java Programming techniques will be inculcated to students through this course. They will be able to appreciate the difference between JAVA and C++ classes

INSTRUCTIONAL OBJECTIVES:

At the end of the course, student should be able to:

- Setup, test and disconnect internet connections.
- Differentiate between various internet browsers
- Understand classes and objects in JAVA
- Overload, inherit and override methods
- Handle exceptions.

UNIT-I : INTERNET AND ITS PROTOCOLS

History of Internet - Internet addressing - TCP/IP DNS and directory services - Internet applications - E-mail , FTP,Telnet - Dialup Networking - Setting up Internet connection - Testing Connection - Disconnectiong from the Internet.

UNIT-II: INTERNET TOOLS

Overview - Hyper text Markup language - Uniform Resource locators - MIME types, Browsers - Netscape navigator , Internet explorer - Net Meeting, Chat - Search Engines.

UNIT-III: FUNDAMENTALS OF JAVA

Introduction to JAVA - Features of JAVA - Object oriented concepts - Datatypes - Variables and arrays - Operators & Control statements - Classes - Objects - Constructors.

UNIT-IV: OOPS IN JAVA; MUTITHREADING

Overloading methods - Static class - Inner Classes - StringClass - Inheritance - Overriding methods - Abstract Class - Packages & Interfaces - Exception handling - Multithreaded programming

UNIT-V: I/O & APPLET

I/O Streaming - Object serialization - Applets - Networking - AWT Classes - AWT Controls - Layout Managers and Menus.

BOOKS FOR STUDY:

1. Deitel & Deitel - Internet & world wide web How to program - Prentice Hall 1999.
2. Margaret Levine Young - Internet - Complete reference - Milennium edition1999
3. Harley Hahn, The Internet - Complete reference - McGraw Hill - 1996.
4. P.Naughton and H.Schildt - Java 2 The Complete Reference - TMH - 2000.
5. Art Gittleman - "Java Programming" - Wiley dreamtech - 2002.
6. K. Arnold and Gosling - Java Programming Language. - Addison Wesley - 2000.

CST603 ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

PURPOSE

Provides knowledge on AI concepts and knowledge engineering with expert system design.

INSTRUCTIONAL OBJECTIVES

It aid the students to know and implement the current trend and advanced technology in computation.

UNIT-I : INTRODUCTION

Overview of AI : Importance of AI - AI and Related fields - Knowledge General Concept: Definition and importance of knowledge - Knowledge based system - representation of knowledge - knowledge organization - knowledge manipulation - acquisition of knowledge. LISP and other AI programming language: Introduction to LISP - Basic list manipulation Function in LISP - functions, Input and output and local variables - List , array -Prolog and other AI programming language - Formalized symbolic logics - Syntax and semantics for propositional Logic - properties of Wffs - conversion to clausal Form - Inference Rule - Resolution Principle - nondeductive inference methods - representation using rules.

UNIT-II: KNOWLEDGE REPRESENTATION

Dealing with inconsistencies and uncertainties : Truth Maintenance System - Default reasoning and the closed world assumption- predicate completion and circumscription - Model and temporal Logics - Fuzzy Logic and natural Language Computations- probabilistic reasoning: Bayesian probabilistic Inference - possible World representations- Dempster - Shafer theory- Ad-Hoc methods - Heuristic reasoning methods - Structured knowledge : graphs, Frames and related structures: Associative Networks - Frame Structure - Conceptual Dependencies and Scripts - Object Oriented representation: overview - Objects, classes, Messages and methods Simulation example using OOS program. Object Oriented Language and System.

UNIT-III: KNOWLEDGE ORGANIZATION AND MANIPULATION

Search and control strategies: Preliminary concepts - Examples of Search problem - Uniformed or blind search - informed search - Search And - Or Graph - Matching techniques: Structures Used in Matching - Measures for Matching - Matching like Patterns - Partial Matching - Fuzzy Matching algorithm- RETE Matching algorithm -Knowledge organization and management : Indexing and Retrieval Techniques- integrating knowledge in memory - memory organization system

UNIT-IV: PERCEPTION, COMMUNICATION AND EXPERT SYSTEM

Natural language processing: Overview of linguistics - Grammar and Language - Basic Parsing Techniques - Semantic Analysis and representation structures - Natural Language Generation - Natural Language System - Pattern recognition: The recognition and classification process - Learning classification pattern - recognizing and understanding Speech - Visual image understanding: Image transformation and Low level Processing -Intermediate Level Image Processing -Describing and Labeling objects - high Level Processing - Vision System Architecture – Expert system architectures: Rule Based system architecture - Nonproduction System architecture - Dealing with uncertainty -knowledge acquisition and validation - knowledge system building tools.

UNIT-V: KNOWLEDGE ACQUISITION

General concepts in Knowledge acquisition: Types of learning - knowledge acquisition Is difficult - General learning model - performance measures -Early work in machine learning: Perception -Checker Playing Example - Learning automata - Genetic Algorithm - Intelligent Editors - Learning by induction: Basic Concepts - Generalization and specialization - Inductive Bias -Example of an Inductive Learner - Examples of other inductive learners: ID3- LEX- INDUCE- Learning structure Concepts.

TEXT BOOKS:

1. Patterson W Dan - "Introduction to Artificial Intelligence and Expert System" - Prentice Hall - 1990.
2. Rich Elaine Knight Kevin - "Artificial Intelligence" - Tata McGraw Hill - 2002.

REFERENCE BOOK:

1. David W Rolston - "Principles of Artificial Intelligence and Expert Systems Development " - McGraw Hill International Edition - 1988

CST604 OBJECT ORIENTED ANALYSIS AND DESIGN

PURPOSE

Object oriented Analysis and Design extends the traditional software engineering paradigms, and incorporates the evolution of Object Oriented Programming. The layered approach of Object Oriented Analysis and Design and Use Case analysis helps the developer to build Data-centric, Component Based, Software. Introduction to Patterns, UML also helps to produce better reusable software and promotes software re-engineering and reduces software complexity.

INSTRUCTIONAL OBJECTIVES

After learning Object Oriented Analysis and Design, students are able to solve the complex problems with industrial standards and ease. They will obtain knowledge in the following areas :

- Object Oriented Methodologies
- Component Based Development
- Patterns and Frameworks
- Unified Approach • UML
- Designing View layer
- Impact of Object Orientation on Testing

UNIT-I : OBJECT ORIENTED SYSTEM DEVELOPMENT

System development - foundations of the object model -Features of Object oriented / Data centric methodology -Key concepts of object - Object oriented software Development - OOSDLC - Software Quality and Reusability - Prototyping – CBD

UNIT-II : OBJECT ORIENTED METHODOLOGIES

Object oriented methodologies - Rumbaugh - Jacobson - Booch - Shlaer and Mellor Model - Coad / Yourdon Model - Analysis and Design Patterns - Frameworks - Unified Approach - Steps involved in OOA and OOD- Layered Approach

UNIT-III : UML

UML - Fundamentals - Comparison of UML model with other Models - Static and Dynamic Models - OOA - Conceptual Model - Use Case - Relationships - Documentation - Class Diagram - Relationships - Inheritance, Aggregation, Dependency, Association - Kinds of Association, Realization, Friend Class, Interface - Meta Model - Reusability of classes - Object Diagram - Sequence and Collaboration Diagrams - Activity and State Chart Diagrams - Component and Deployment Diagrams - Case Study

UNIT-IV : ACCESS LAYER AND VIEW LAYER

Object storage - Persistence - Design Axioms and Corollary - and object interoperability - OODBMS - ORDBMS - Object Relational Mapping - - Designing View layer interface objects and Guidelines

UNIT-V : OBJECT ORIENTED TESTING

Software quality - Testing strategies - Impact of object orientation on testing - Test cases - Test Plan - Continuous Testing - Myers's Debugging Principles - Usability and User satisfaction test

TEXT BOOKS:

1. Ali Bahraini, "Object Oriented System Development", McGraw Hill International Edition, 1999.
2. H.Srimathi et al. - "Object oriented analysis and design using UML" – Scitech Publications. - 2002.
3. Grady Booch, James Rumbaugh, Ivar Jacobson, - "The Unified Modeling Language User Guide" - Addison Wesley Long man, 1999, ISBN 0-201-57 168-4.\

REFERENCE BOOKS:

1. Craig Larman, "Applying UML and patterns" - Addison Wesley - 2000.
2. Fowler - "Analysis Patterns" - Addison Wesley - 1996.
3 Erich Gamna- " Design Patterns" - Addison Wesley - 1994.

CST605 MANAGEMENT INFORMATION SYSTEM

PURPOSE

This course provides a complete, comprehensive coverage pf various management information system. It gives a simplified development techniques of various management information system.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to
- Develop various MIS applications like Finance, Marketing, Material management etc.,
- Provide Database and User interface for various MIS applications
- Design an organization forms
- Understand office automation techniques

UNIT-I: INTRODUCTION

MIS Definition - Systems Approach - Planning - Designing - Development - Implementation - Evaluation.

UNIT-II: MIS APPLICATIONS

MIS Applications - Finance Management - Marketing Management - Materials Management - Production Management - Personnel Management.

UNIT-III: ENGINEERING APPLICATIONS

Engineering Applications - Design Support Systems - Needs - Electronic Spread Sheet.

UNIT-IV : LONG RANGE INFORMATION SYSTEM

Developing a long-range Information system plan - Strategies for the determination of Information requirements - Data base requirements - User Interface requirements.

UNIT-V: PERSONAL COMPUTERS

Personal Computers as Workstation - Rate of Personal Computers in Office Automation - Organisation and Methods - Forrn Design - Form Control.

TEXT BOOK:

1. Davis G. B. and Olson M.H. - " MIS Conceptual Foundations, Structure and Development" - McGraw Hill, 1985.

REFERENCE BOOKS:

1. Lucey T. "Management Information System "- Continuum - 2001
2. Robert A Schultheis , et.al - "Management Information Systems : The Manager's view" - Richard & Irwin publishers - 1992.

CST606 **PRACTICAL X**

INTERNET AND JAVA LAB

PURPOSE

The purpose of this subject is to introduce the students to beginning Java programming concepts like writing loops, branching statements , inheritance, polymorphism, abstraction, encapsulation , applets and working with HTML controls.

OBJECTIVES

On completion of this subject, the student should be able to :

- Expand the students' understanding and exposure to the Java programming language and class libraries.
- Demonstrate the working of the applets.
- Help the students to know about email working chatting, net meeting.

LIST OF EXPERIMENTS

I INTERNET EXPERIMENTS

Working various types of Browsers - Internet Explorer, Netscape Navigator
Sending and receiving mails, chat, searching, Net meeting
2. HTML tags
3. HTML - Form with various controls

II JAVA EXPERIMENTS

4. Working with various types of Operators
5. Working with various types of Control Statements
6. String Class - Inner class
7. Abstract Class - Constructors
8. Overloading methods
9. Overriding Methods
10. Inheritance
11. Packages - Interfaces
12. Exception handling
13. Multithreading
14. I/O Streams
15. Working with applets
16. Working with AWT - Creation of Various controls using AWT

REFERENCE BOOKS

1. Deitel & Deitel - Internet & world wide web How to program - Prentice Hall 1999.
2. Margaret Levine Young - Internet - Complete reference - Milennium edition1999
3. Harley Hahn, The Internet - Complete reference - McGraw Hill - 1996.
4. P.Naughton and H.Schildt - Java 2 The Complete Reference - TMH - 2000.
5. Art Gittleman - "Java Programming" - Wiley dreamtech - 2002.
6. K. Arnold and Gosling - Java Programming Language. - Addison Wesley - 2000.

CST701 OPERATIONS RESEARCH

PURPOSE

To impart to the students of Engineering, the rudiments of Mathematics so as to enable them to apply the same for their own branch.

INSTRUCTIONAL OBJECTIVES

To equip the students of Engineering, the knowledge of Mathematics and its applications so as to enable them to apply them for the branch in which they are admitted.

UNIT I LINEAR PROGRAMMING

Introduction to Linear Programming - Formulation of the problem - Graphical method - Simplex method - Artificial variable techniques - Primal-dual problems - Dual Simplex method.

UNIT II ADVANCED LINEAR PROGRAMMING PROBLEMS

Integer programming problem - Cutting plane algorithm - Transportation models - Vogel's Approximation method - MODI method - Unbalanced transportation problem - Degeneracy in transportation models - Assignment models - Traveling salesman problem.

UNIT III RESOURCE SCHEDULING AND NETWORK ANALYSIS

Problem of sequencing - Sequencing n jobs through 2 machines and 3 machines, 2 jobs through m machines.PERT and CPM -Critical path calculation - Probability and cost consideration.

UNIT IV INVENTORY CONTROL

Inventory models - Deterministic models - Economic ordering quantity, Reorder level, optimum cost - Instantaneous and Non-instantaneous receipt of goods with or without shortages.

UNIT V REPLACEMENT AND GAME THEORY

Replacement Models - Replacement of items that deteriorate with time - Equipment that fails suddenly. Two person zero sum games - Pure strategies and saddle point - Mixed strategies - 2xM and Mx2 games - Method of dominance - Numerical and graphical solutions.

TEXT BOOKS

1. Kanti Swarup, Gupta P.K., and Man Mohan, Operations Research, Sultan Chand & Sons, 1994.
2. Gupta P.K., and Hira D.S., Operations Research, S.Chand & Sons, 2000.
3. Sundaresan.V, Ganapathy Subramanian.K.S. and Ganesan.K, Resource Management Techniques, A.R. Publications,2002

REFERENCE BOOKS

1. Taha H.A., Operations Research - An introduction, 7th edition, PHI, 2002.
2. Sharma S.D., Operations Research, Kedarnath Ramnath & Co., Meerut,1994.
3. Billy B. Gillet, Introduction to Operations Research - TMH Publishing Co.
4. Gupta P.K., and Manmohan, Operations Research and Quantitative Analysis - S.Chand & Co., New Delhi.
5. Hamblin S., and Stevens Jr., Operations Research, Me Graw Hill Co.

CST702 PRINCIPLES OF PROGRAMMING LANGUAGES

PURPOSE

The purpose of this course is to understand the fundamentals of any programming language and the introduction to Object Oriented Programming which is essential.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Familiarizes the concepts of various Programming Languages.
- Understand the design issues of various programming language constructs are studied.
- Understand the important concepts like Exception are studied.

UNIT-I : INTRODUCTION

Introduction - Programming domains - Language Evaluation Criteric- Influences of Language design - Language Categories - Implementation methods - Evolution of Several programming Languages- Describing syntax and semantics: The general problem - Formal methods - Recursive descent parsing - Attribute Grammers - Dynamic semantics.

UNIT-II: DATA TYPES

Names - Variables - Concept of binding - Strong typing - Type compatibility - Scope - Scope and lifetime - Data type: Primitive, Character, String, User-defined, array, associate arrays, record, union, set and pointer type of data.

UNIT-III: EXPRESSIONS, CONTROL STATEMENTS & SUBPROGRAMS

Arithmetic expressions - Overloaded operators - Relational and Boolean expressions - Assignment statement. Control Structures: Compound statements - Selection statements - Iterative statements - Unconditional branching. Subprograms: Fundamentals - design issues - local referencing environment - Parameter passing methods - Overloaded Subprograms - Design issues for functions - Accessing nonlocal environments - User-defined overloaded operators.

UNIT-IV: OOPS

Object oriented programming - Design issues - Overview of Smalltalk - Support for OOP in C++ - Support for OOP in JAVA - Implementation of Object Oriented Constructs. Concurrency : Introduction to subprogram - Level Concurrency - Semaphores - Monitors - Message passing - Statement level concurrency. Exception Handling: Introduction exception handling in C++ and JAVA.

UNIT -V: FUNCTIONAL PROGRAMMING LANGUAGE

Functional Programming Language: Mathematical functions - Fundamentals of Functional Programming Languages- LISP - Common LISP. Logic Programming Language: An Overview of Logic Programming - The Origins of Prolog - Application of Logic Programming.

TEXT BOOK:

1. Robert W. Sebesta - "Concepts of Programming Language " - Addison Wesley - 1999.

REFERENCE BOOKS:

1. Pratt T.W. & Zelkowitz M.V. - "Programming Languages - Design and implementation" - PHI - 2001.
2. Horowitz. E - "Fundamentals of Programming Language" - Galgotia Publications - 2000.

CST703 **ADVANCED JAVA PROGRAMMING**

PURPOSE

The main focus is Advanced Java Technologies and Architecture. Students will learn to use Java technologies in the real world.

INSTRUCTIONAL OBJECTIVES

At the end of this course, the student can understand :
- Usage of the controls in applets.
- Development of java servlets
- JSP
- XML technologies

UNIT-I : SEVLET

Servlet Overview - The Java Web Server - Your First Servlet - Servlet Chaining - Server side includes - Session Management - Security - HTML Forms - Using JDBC in servlets - Applet to Servlet Communication.

UNIT-II : JAVA BEANS

The Software component assembly model - the Java Beans development kit - developing beans - Notable beans - using infobus - Glasgow developments.

UNIT-III: JAVA SERVER PAGES

Introducing JSP - The Nuts and Bolts-JSP Basics- The Dispatcher Approach-JSP Technical Support.

UNIT-IV: DOCUMENTATION OF JSP

Anatomy of a Tag Extension-Writing Tag Extensions-Techniques for Writing Maintainable JSP-Documenting the JSP Layer- Coding Standards for Maintainable JSPs.

UNIT-V: XML

A Primer on XML- A Primer on XML Technologies-Well Formed ness Constraints-The Logical Structure of an XML document- DTDs, Parsers and validations- XML Namespaces-Styling XML with CSS- Styling XML with XSL

BOOKS FOR STUDY

1. Karl Moss - Java Servlets - Second Edition - Tata McGraw Hill Edition., 1999.
2. Dustin R. Callaway - Inside Servlets - Addison Wesley, 2001.

3. Joseph O'Neil - Java Beans Programming from the ground up - McGraw Hill -1998
4. Tom Valesky - Enterprise Java Beans - Addison Wesley - 1999.
5. Cay S Horstmann and Gary Cornell - Core Java - Vol II - Advanced FeaturesPHI - 2001.
6. Subrahmanyam Allamaraju - Professional Java Server Programming J2EE - Wrox Press Inc. - 2001.

CST704 **WEB GRAPHICS AND MULTIMEDIA**

PURPOSE

This course aids in creating multimedia projects and presentation and usage of multimedia on world wide web. It also provides a comprehensive presentation on the working of modern web graphics

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Image basics
- Multimedia offering tools
- Digital audio and video techniques
- Multimedia project planning
- Flash framework

UNIT-I : INTRODUCTION

HTML coding - Basic web graphics - Web page design and site building - Image maps - Adding multimedia to the web - Image basics - Color Palette - Layers - Creating new images - Brushes - Grids - Scaling Images - Merging layers - Tool Palette - Screen Capturing - Grey styling - Using style Palette.

UNIT-II: MULTIMEDIA HARDWARE AND SOFTWARE

Multimedia : Definitions - CD-ROM and the Multimedia Highway - where to use Multimedia - The team -Macintosh Versus PC - The Macintosh Platform - The windows Multimedia PC Platform - Hardware Peripherals : Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices - Text Editing and Word Processing Tools - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image-Editing Tools - Sound Editing Tools - Animation, Video and Digital Movie Tools - Linking Multimedia Objects - Office - Suites - Word Processors - Spreadsheets - Databases - Presentation Tools.

UNIT-III: MULTIMEDIA AUTHORING TOOLS; TEXT AND SOUND

Types of Authoring Tools - Card and Page-based Authoring Tools - Icon-based Authoring Tools - Time based Authoring Tools - Object-Oriented Authoring Tools - Cross-Platform Authoring Tools - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext -The Power of Sound - Multimedia System Sounds - MIDI Vs Digital Audio - Digital Audio - Making MIDI Audio - Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your Multimedia Project - The Red Book Standard.

UNIT-IV: MULTIMEDIA BUILDING BLOCKS & INTERNET

Making Still Images - Color - Image File Formats - Principles of Animation - Making Animations That Work -Using Video - Broadcast Video Standards - Integrating Computers and Television - Shooting and Editing Video - Recording Formats - Digital Video- Creating Clippings - Animations with sound effects - Windows Media Player ActiveX control - Agent control - Embedding VRML in a web page - Real Player ActiveX control. Assembling & Delivering Project : Project Planning - Estimating - REPs and Bid Proposals - Designing - Producing -Acquiring Content - Using Content Created by Others - Using Talent - Testing - Preparing for Delivery - Delivering on CD-ROM - Compact Disc Technology - Wrapping It Up - Delivering on the World Wide Web.

UNIT-V: FLASH

Understanding Flash framework - Exploring the Interface: Panels, Settings and more - Working with selection and pen tool - Working with Drawing and Painting Tools - Applying color - Working with text - Drawing in Flash - Animating in Flash - Importing and Editing Sound in Flash

TEXT BOOKS:

1. Tay Vaughan – Mu1ltimedia : Making it work. - Tata McGraw Hill Edition - 1999.
2. Lowerry, Reinhardt & Lentz - Dreamweaver and Flash Bible - Hungry Minds - 2001
3. Richard Schrand - Photoshop 6 Visual Jumpstart - Adobe Press - 2000.

REFERENCE BOOKS:

1. Walterworth John A - Multimedia Technologies and Applications - Ellies Horwood Ltd. - London - 1991.
2. James L. Mohels - Flash 5.0 Graphics, Animation & Interaction - Macromedia - 2000.

CST706 **PRACTICAL XI**

ADVANCED JAVA LAB

PURPOSE

The main focus is to train the students practically in the field of Advanced Java Technologies.

INSTRUCTIONAL OBJECTIVES

At the end of this course, the student should be able to develop various applications using :

- Java Servlets
- Java Beans

LIST OF EXERCISE

I SERVLETS PROGRAMMING

1. Write a servlet to display
   a) IP address and port number of a server.
   b) The host name and address of the computer on which your browser visits.
2. Use a servlet as RMI Client to enable a method given.
3. Using servlet create a form which contain a text area, check box, radio button, label and text field with buttons.
4. Create a chat program that uses servlet to communicate with 2 machines.
5. Create a Servlet that gets the date and time of the system.

II BEANS PROGRAMMING

6. Create a time zone list and retrieve any time which is given with zone using Java beans.
7. Develop a bean program that display a sequence of images in the form of a slide show.
8. Create a bean that displays a 3D plot of the following function z = f(x,y)=0.01 *x^2- y 2.

REFERENCE BOOKS:

1. Karl Moss - Java Servlets - Second Edition - Tata McGraw Hill Edition., 1999.
2. Dustin R. Callaway - Inside Servlets - Addison Wesley, 2001.
3. Joseph O'Neil - Java Beans Programming from the ground up - McGraw Hill - 1998
4. Tom Valesky - Enterprise Java Beans - Addison Wesley - 1999.
5. Cay S Horstmann and Gary Cornell - Core Java - Vol II - Advanced FeaturesPHI - 2001.

6. Subrahmanyam Allamaraju - Professional Java Server Programming J2EE - Wrox Press Inc. - 2001.

PRACTICAL XII

CST707 **MULTIMEDIA LAB**

PURPOSE

This course aids in creating multimedia projects and presentation and usage of multimedia on world wide web. It also provides a comprehensive presentation on the working of modern web graphics

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Various study of Multimedia kits
- Compression algorithms
- Video effects
- Multimedia software
- Image compression

LIST OF EXERCISE

1. Components of Multimedia Kit a) Study of CD ROM drive b) Study of Video Card c) Study of Sound Card
2. Basic software programs for CD ROM drive, sound card and video card
3. Programs for compression algorithms of text
4. Programs for video effects like video
5. Programs for video effects like zoom
6. Study of Multimedia software
7. Image Compression

REFERENCE BOOKS:

1. Tay Vaughan - Multimedia : Making it work. - Tata McGraw Hill Edition - 1999.
2. Lowerry, Reinhardt & Lentz - Dreamweaver and Flash Bible - Hungry Minds - 2001
3. Richard Schrand - Photoshop 6 Visual Jumpstart - Adobe Press - 2000.
4. Walterworth John A - Multimedia Technologies and Applications - Ellies Horwood Ltd. - London - 1991.
5. James L. Mohels - Flash 5.0 Graphics, Animation & Interaction - Macromedia - 2000.

CST801 **UNIX NETWORK PROGRAMMING**

PURPOSE

The purpose of this course is to impart knowledge on Inter process communication tools and socket programming using Unix.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Advanced programming in the Unix environment
- Inter process communications
- TCP and UDP sockets programming techniques
- Back round processes
- Broadcasting and multicasting
- Transferring out-of-band data
- Raw sockets

UNIT-I : INTRODUCTION

Unix standardization and Implementations - File I/O - study of open, close, read, write, lseek, dup, fcntl system calls - Files & directories -study of stat, access, chmod, chown, link, unlink and directory related system calls - time and date routines - setjmp and longjmp functions - Process Control - fork, vfork, exec, and wait functions.

UNIT-II : SIGNALS & INTER PROCESS COMMUNICATIONS

Signals - Signal concepts - signal function - SIGCLD semantics - kill and raise functions - alarm and pause functions - signal sets - sigpending, sigaction, abort and sleep functions - Advanced I/O - Nonblocking I/O - Record Locking - Streams - I/O Multiplexing - IPC - Pipes - FIFO's - System V IPC's - Message queue - Semaphore - Shared memory.

UNIT-III :ELEMENTARY SOCKETS

Overview of TCP/IP Protocols - Socket Introduction - TCP Sockets - Debugging Techniques - TCP echo Client - Server Examples - I/O Multiplexing - Socket Options - Elementary UDP Sockets - Elementary Name and Address Conversions.

UNIT-IV : ADVANCED SOCKETS

Advanced Name and Address Conversions - Daemon Processes and inetd SuperServer - Broadcasting - Multicasting.

UNIT-V : RPC AND RAW SOCKETS

Remote Procedure Calls - Out-of-Band Data - Raw Sockets - Data Link Access.

TEXT BOOK:

I . Richard Stevens.W - "Advanced Programming in the Unix Environment" - Pearson Education Asia -1998.
2. Richard Stevens.W- "Unix Network Programming Vol - I "- PHI - 2003.

REFERENCE BOOKS:

1. Richard Stevens.W- "Unix Network Programming Vol - 11 "- PHI - 2003.

CST802 **ADVANCED DATABASES**

PURPOSE

Introducing the recent trends in Database concepts and to know the strength of each databases is the purpose of this course.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand

- Relational Model
- Parallel and Distributed databases
- Object Relational Databases
- Mobile and Multimedia databases
- Data Warehousing and Data mining

UNIT-I : INTRODUCTION

Relational Model : Structure of Relational Databases - Relational algebra - Tuple Relational Calculus - Domain Relational Calculus - Extended Relational Algebra Operation - Views - SQL - Normalization.

UNIT-II : PARALLEL AND DISTRIBUTED DATABASES

Parallel databases - I/O parallelism - Inter query and Intra query parallelism - Intra operation and Interoperation parallelism - Design of parallel databases - Disturbed databases - Distributed data storage - Network transparency distributed query processing - Transaction model - Commit protocols - Coordinator selection - Concurrency control - Deadlock handling - multi database systems.

UNIT-III : OBJECT RELATIONAL DATABASES

Object orientation - The object oriented data model - Object Oriented Language - Persistent Programming Language - Persistent C++ system - Comparing object model with other data model - Object orientation as basis for data management Nested Relations - Complex types and object Orientation - Querying with Complex types - Creation of complex values and objects - storage structures for Object Oriented Database

UNIT-IV : OTHER DATA BASES

Internet database: WWW - Introduction to HTML - Database & the Web - Architecture, Application server and server side Java - Beyond HTML - Introduction to XML - XML

DTDs - Domain-specific DTDs - XML-QL - Semistructured Data model - Implementation issues for Semistructured Data Model - Indexing for Text Search - Inverted files - Signature file - Mobile Databases - Real-time DBMS - Multimedia databases.

UNIT-V : SPECIALIZED DATABASES

Active & Detective Databases - Temporal and Spatial Data Bases - Data Warehousing : Architecture - Implementation. Data Mining: Rules - Clustering.

TEXT BOOKS:

1. Raghu Ramakrishnan & Gehrke - Database Management System - McGraw Hill - 2000.
2. Ramez Eimasri, Shamkant, B.Navathe - "Fundamentals of Database Systems" - Addison Wesley - 2000.
3.Korth & Silberschatz - Database system concepts - McGrawHill - 1997.

REFERENCE BOOKS:

1. Dittrich,Dayal & Buchmann - Object Oriented Database system - SpringerVertag - 1991.
2. Richard Cooper - Object Databases-An ODMG Approach - International Thomson Computer Press - 1997.
3. Bindu. R. Rao - Object Oriented Databases-Technology, Applications and Product - McGrawHill - 1994.
4. Gary W. Hanson and James V.Hanson - "Data base management and Design" - PHI - 1999.

CST803 **PRINCIPLES OF COMPILER DESIGN**

PURPOSE

The purpose of this course is to familiarize the internal operations of a compiler to the students

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Lexical analysis, finite state techniques and scanner generator
- Parsing techniques
- Intermediate code generation and symbol tables
- Runtime implementation of a programming language
- Error recover scheme, code optimization and object code generation

UNIT-I : INTRODUCTION

Introduction to Compilers - Compilers & Translators - Assembly language - Macros - Structure of a Compiler - Compiler writing tools - Bootstrapping - Definition of programming languages - Lexical and syntactic structure of language - Elements of a format language grammar - Derivation and reduction of syntax trees - Context free grammars - Capabilities of a context free grammar.

UNIT-II : LEXICAL ANALYSIS

Lexical Analysis - role of Lexical analyzer - finite Automats - Regular expressions to finite automata - Minimizing the number of states of DFA - Implementation of a lexical analyzer

UNIT-III :PARSING TECHNIQUES

Parsers - Parse trees - Left most and right most Parsing techniques - Top down and Bottom up parsing - Predictive parsers - Simple Precedence Parser - LR Parsers - Constructing SLR Parser tables - Constructing Canonical LR parsing table - constructing LALR Parsing tables - Using ambiguous Grammars

UNIT-IV : SYMBOL TABLE

Symbol table - The contents of a symbol table - Data structures for symbol table - Syntax directed translation schemes - Semantic action - Implementation - Intermediate code generation - Three address codes , Quadruples and triples, syntax trees - Errors - Lexical Phase Errors - Syntactic Phase Errors - Semantic Errors.

UNIT-V : CODE OPTIMIZATION

Code optimization - Principal sources of Optimization - Loop optimization - Machine dependent optimization - DAG representation in Basic Blocks - Code Generation - Problems in Code Generation - A simple code Generator - Register allocations and assignment - Code generation from DAG's - PEE hole optimization.

TEXT BOOK:

1. Aho A.V., Ullman J.D. - Principles of Compiler Design - Narosa Publising House, 1987.

REFERENCE BOOKS:

1. Dhamdhre, D.M. - Compiler Construction - Principles and practice - Macmillan India Ltd., 1983.
2. David Gries - Compiler Construction for Digital computers, John Willey International Edition - 1971.

CST806

PRACTICAL XIII

NETWORKING LAB

PURPOSE

The purpose of this course is to impart practical knowledge on Inter process communication tools and socket programming using Unix.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to familiar with :

- Files and directory related functions
- Inter process communication techniques
- TCP and UDP sockets programming techniques
- Broadcasting and multicasting
- Transferring out-of-band data
- Raw sockets

I FILES & DIRECTORIES

1. Programs for cp, mv, Is, Is -1, wc commands using files & directory functions
2. Program for appending a file
3. Programs for the usage of lseek, fork, vfork, exec functions
4. Some programs using signals

II INTER PROCESS COMMUNICATIONS

5. Pipes.
6. Message Queue.
7. Semaphore.
8. Shared Memory

III SOCKET PROGRAMMING

9. Simple Client -Server Communication Program
10. Day Time Server
11. Multi Client-Server Day Time Server
12. Echo Server
13. File Transfer
14. POSIX Signal Handling
15. Chat Program
16. Out-of-Band Data
17. Remote Procedure Call
18. Packet Capturing

REFERENCE BOOK:

1. Richard Stevens.W - "Advanced Programming in the Unix Environment" - Pearson Education Asia -1998.
2. Richard Stevens.W- "Unix Network Programming Vol - I "- PHI - 2003.

CST901 **NETWORK SECURITY**

PURPOSE

The purpose of this course is to provide the students with an understanding of the themes and challenges of network security, the role of cryptography, the techniques for access control and intrusion detection, the current state of the art. To help the students to develop a critical approach to the analysis of network security, and bring this approach to bear on future decisions regarding network security

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Secure information in an organization by using authentication and access control.
- Deploy and manage certificates.
- Secure data transmission by identifying threats to network devices and implementing security for common data transmission, remote access, and wireless network traffic.
- Secure Web servers against common attacks and configure security for Web browsers.
- Protect e-mail messages and instant messaging from common security threats.

UNIT-I : INTRODUCTION

Security problems in computing - Types of security violations: Viruses-WormsTrojan horses, etc., - Password attacks - Denial of service. Internet security : Attack points and weaknesses - Types of services.

UNIT-II: ENCRYPTION

Secure Encryption systems: Conventional Encryption - Classical and Modern techniques : DES-IDEA-Modes of operation. Public Key Encryption systems : Motivation - Mathematical background - RSA Algorithm - Diffie Hellman Key exchange algorithm - Digital signature algorithms - Key Escrow and clipper. Key Distribution techniques: Hash algorithms - MD5 and SHA-1.

UNIT-III: AUTHENTICATION

Authentication applications : Kerberos and X.509-Electronic mail security - PGP and S/MIME.

UNIT-IV: IP SECURITY

IP Security : IP Security overview - Architecture - Authentication header and Encapsulating Security Payload. Web Security: Secure socket layer and secure electronic transaction protocols.

UNIT-V: SYSTEM SECURITY

System security: Viruses and Worms - Intrusion Detection systems: Principles and design - Firewalls: Principles and design.

TEXT BOOKS:

1. William Stallings - "Cryptography and network security" - Pearson Education, 2000
2. Charlie Kaufman, Radia Pearlman, Mike Speciner, - "Network security" - PHI, 2002.

REFERENCE BOOKS:

1. Bruce Schneier - "Practical Cryptography " - Wiley dreamtch - 2003.
2. Charles P.Fleeger - "Security in computing" - PHI - 2000
3. Derik Atkinson and others - "Internet security: Professional refernence" - Tech Media - 1997.
4. Uyless Black - "Internet Security Protocols", Pearson Education - 2000.
5. Othnarkyas - "Internet security" - International Thomson Press - 1997.

CST902 DATA WAREHOUSING AND DATA MINING

PURPOSE

The purpose of this course is to understand the various concepts involved in data mining and data warehousing and the tools that are used in performing those activities.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able :

- To make familiar with the various concepts of data warehousing like meta data, data mart, summary table, fact data and dimension data.
- To sail along with the various approaches in data mining.
- To familiarize with the various data warehousing and data mining tools

UNIT-I : DATA MINING

Introduction - Data Mining Vs Query tools-Practical Applications of Data Mining - Learning - Self, Machine, Concept.

UNIT-II: KDD ENVIRONMENT

Knowledge discovery process - Data Mining - OLAI Tools setting up a KDD environment - The KDD environment - Ten golden rules.

UNIT-III: DATA MINING & WARE HOUSING

Introduction - Why Data Warehouse? Decision Support System - Integration with Data Mining - Client/Server & Data Warehousing - Multi Processing Machines - Cost Justification

UNIT-IV: SYSTEM DESIGN & ARCHITECTURE

Data Warehousing - Types of Data System Process - Architecture and its use - Design of Database - Partitioning - Aggregations - Data Marting - Metadata

UNIT-V: TUNING

Capacity Planing - Tuning - The Data Warehouse - Testing the Data Warehouse - Data Warehouse futures.

TEXT BOOKS:

1. Pieter Adriaans Dolf Zantinge - "Data Mining", Addition Wesly - 1996.
2. Jiawei Han, Micheline Kamber - " Data Mining: Concepts & Techniques" - Morgan Kaufinann Publishers - 2000.
3. S. Anahory, D. Murray - "Data Warehousing in the Real World" - Addison Wesley - 1997.
4. Inmon W. H. - "Building the Data Warehouse" - Wiley dreamtech - 2002.

REFERENCE BOOKS:

1. Ralph Kimball - "The Data warehouse life cycle toolkit" - John Wiley & Sons Inc., - 1998.
2. E. Sperley - "Enterprise Data Warehouse: Planning, Building, and Implementation, Volume 1" - Prentice-Hall - 1999.
3. D. Pyle, Data Preparation for Data Mining - Morgan Kaufinann, 1999.
4. O. Maimon and M. Last - Knowledge Discovery and Data Mining - The Info-Fuzzy Network IFN Methodology - Kluwer Academic Publishers, Massive Computing Series, 2000.

CST903 SOFTWARE PROJECT AND QUALITY MANAGEMENT

PURPOSE

Though the software engineering standards are followed, still there is a question of software quality drive. Since the software development is human based, to produce and maintain better reusable software the various project management standards such as CMM, TSP and PSP standards are evolved. Almost all the software development industries irrespective of size follow ISO standards to build quality software. To produce better IT professionals and Managers, the `Software Project and Quality Management' subject is introduced.

INSTRUCTIONAL OBJECTIVES

After learning this subject, the students will become software quality professionals and gain knowledge in the following areas:

- SEI - CMM standards
- TSP and PSP standards
- ISO 9000: 2000 standards
- Software Project Management - Architecture, Artifacts and Milestones

UNIT-I : INTRODUCTION

Software Management Renaissance - Comparison of Conventional and Modern Project Management - A Software Management Process Framework - The Artifacts of Software - Architecture, Workflows and Milestones - Software.

UNIT-II : MANAGEMENT DISCIPLINES

Management Disciplines - Process Automation - Process Control and Process Instrumentation - Tailoring the process - Managing the Software Process - SEI CMM levels - Initial Process - Repeatable Process - Project Plan -SCM- SQA

UNIT-III : THE DEFINED, MANAGED & OPTIMIZING PROCESSES

The Defined Process - Software standards - Software Inspections - SCM - SEPG - The Managed Process - Data gathering and analysis - Managing software quality - The Optimizing Process - Defect Injection and Prevention - Automating and Contracting for software

UNIT-IV : PSP, TSP AND QUALITY CONTROL

PSP and TSP -Improved Project Management by incorporating PSP and TSP levels- Quality control - Software Quality Assurance - Statistical Quality Assurance - QC tools - Business Process Re-engineering - Zero Defect, Six sigma, Quality Function Deployment, Benchmarking, Statistical Process Control- Clean Room Software Engineering

UNIT-V : QUALITY ASSURANCE MODELS

Models for Quality Assurance - !SO 9000 : 2000 series - Implementation of ISO standards on Software - Case study.

GROUP A ELECTIVIES

TCP/IP NETWORKS

PURPOSE

This course provides an in-depth analysis of the structure of TCP/IP software and also discusses various protocols in light of design alternatives, decisions and implementation techniques.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- The design of TCP/IP networks
- The structure of various protocols like Remote login protocol, telnet protocol, ftp etc.
- IP routing techniques
- TCP Connection establishment and termination
- TCP timeout and retransmission

UNIT-I: INTRODUCTION

Introduction - TCP/IP Layering - Domain name system - Encapsulation - Demultiplexing - Client Server model - RFC's - Link Layer - Internet protocol - Address Resolution protocol - Internet control message protocol - Ping program - Traceroute program.

UNIT-II: ROUTING

IP routing - Dynamic routing protocols - User datagrap protocol - Broadcasting - Multicasting - Internet group management protocol.

UNIT-III : DNS

The domain name system - Trivial file transfer protocol - Bootstrap protocol - Transmission control protocol - TCP Connection establishment and termination - TCP interactive data flow - TCP bulk data flow.

UNIT-IV: TCP TIMEOUT AND RETRANSMISSION

TCP timeout and retransmission - TCP Persist timer - TCP Keep alive timer - TCP futures and performance - Simple networks management protocol.

UNIT-V: REMOTE LOGIN

Remote login protocol - telnet protocol - File transfer protocol simple mail transfer protocol - Network file system.

TEXT BOOKS:

1. Richard Stevens W - TCP/IP Illustrated - Vol I - Addison Wesley Publications - 1994.
2. Douglas comer - Internetworking with TCP/IP Vol I- PHI - 2000.

REFERENCE BOOKS:

1. Behrouz A. Frouzan - TCP/IP Protocol suite - TMH - 2002.
2. Sidnie Feit - TCP/IP - McGraw Hill - 1996.
3. John Ray - Using TCP/IP - McMillan Pub. Co. - 1999.
4. David M. Peterson - TCP/IP Networking - McGraw Hill - 1995

DECISION SUPPORT SYSTEM

PURPOSE

This course provides the characteristic, requirements and design of Decision Support System. Also provides a brief overview of AI and knowledge based DSS.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to

- Develop Decision Support System with sound knowledge in integration of tools
- Implement integrated DSS for industrial and system engineering applications
- Develop Artificial Intelligence DSS
- Demonstrate the use of DSS in Financial and Strategic planning

UNIT- I : INTRODUCTION

Introduction to DSS - DSS and Three Levels of management - Requirements for DSS - Tools for building DSS - Pradoxes Around DSS - Characteristics of a successful DSS - User's Needs Vs Developer's Needs.

UNIT-II: MODELS

Model and Model Building - Basic Ingredients of Models - Implementation and Interpretation of Models - Classification of Models - Relational Theory of Model Management - Data Base Management Systems for DSS.

UNIT-III : AI IN DSS

Artificial Intelligence in DSS - OPTRANS, DSS Generator - Conceptual Model for Knowledge base DSST-

UNIT IV: OFFICE AUTOMATION

DSS for Offices Automation - Use of Knowledge based DSS for Auditing.

UNIT-V: APPLICATIONS

Financial Diagnostics, Resource Allocation and Strategic Planning.

TEXT BOOKS:

1. Sitausu S. Mittra - " Decision Support Systems - Tools and Techniques" - John Wiley N.Y. 1986.
2. Clydl W. Holsapple and Andrew B. Winston - "Decision Support Systems - Theory and Applications" - West Publishing Company - 1996

REFERENCE BOOK:

1. Efrain Turban JaY. E.Aronson - Decision Support System and Intelligent Systems - Pearson Education Asia- 2000.

DISTRIBUTED COMPUTING

PURPOSE

This subject provides an introduction to distributed computing concepts: distributed operating systems, network operating systems, middleware, client-server systems, common layer application protocols (RPC),distributed processes, network naming, distributed synchronization and distributed-computing security. It also provides real experience with these concepts using a programming paradigm. The student will gain a positive exposure to the professional responsibilities that are part of operating system and distributed system design and development.

INSTRUCTIONAL OBJECTIVES:

Students who will study this subject will understand the fundamental issues involved in the design of distributed computing systems like

- Characteristics of Distributed Systems
- Interprocess Communications
- Synchronization
- Distributed File Systems
- Fault Tolerance
- Naming
- Security in distributed systems

UNIT-I : INTRODUCTION

Characteristics of Distributed Systems - Networked vs Centralized Systems - The Properties and Services Model - Achieving the Global Properties.

UNIT-II : BROADCAST

Fault-Tolerant Broadcasts -Models of Distributed Computation -Broadcast Specifications -Broadcast Algorithms -Terminating Reliable Broadcast. Names - Naming in General - Naming in Distributed Systems -Examples.

UNIT-III: IPC, PROTOCOL ORGANIZATIONS

Interprocess Communications -Introduction -Computer Networks - Protocol Organization -Fundamental Properties of Protocols -Types of Data Transport - Transport Protocols for Remote Operations-Remote Procedure Call -Systems Issues

UNIT-IV: TRANSACTION & CONCURRENCY CONTROL

Transaction Processing Techniques -What Are Transactions? -Concurrency Control - Single-site Recovery -Distributed Recovery -Other Concurrency Control Methods -

Distributed Concurrency Control -Nested Transactions. Distributed File Systems -The Andrew File System -A Glimpse of Other Distributed File Systems.

UNIT-V: AUTHENTICATION IN DISTRIBUTED SYSTEMS

Authentication in Distributed Systems -Concepts -Theory -Channels and Encryption - Principles with Names -Roles and Programs -Delegation -Authenticating Interprocess Communcation - Access Control.

TEXT BOOKS:

1. Sape Mullender-" Distributed Systems"- Addison-Wesley Publications1993. Prentice Hall - 2001. 2. Andrew S. Tanenbaum -"Distributed Systems: Principles and Paradigms"-

REFERENCE BOOKS:

1. Andrew S. Tanenbaum - "Modern Operating Systems" - Prentice Hall - 1994.
2. Glen Bruce, et al. - "Security in Distributed Computing"- Prentice Hall - 1996.

EMBEDDED SYSTEMS

PURPOSE

This course focuses on fundamental concepts and provides an in-depth treatment about embedded microcomputer system and software development using the same.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Microchip PIC Micro Controller
- Embedded Microcomputer system
- Object oriented interfacing
- Real Time Operating System Services

UNIT-I : REVIEW OF EMBEDDED HARD WARE

Gates - Timing Diagram - Memory - Microprocessor - Buses - Direct Memory Access - Interrupts - Built ins on the Microprocessor - Convention Used on Schematic - Schematic - Interrupts Microprocessor Architecture - Interrupt Basics - Shared Data Problem - Interrupt Latency.

UNIT-II: MICROCHIP PIC MICRO CONTROLLER

Introduction - CPU Architecture - Registers - Instruction Sets - Addressing Modes - Loop Timing - Timers - Interrupts Timing - I/O Exception - I^2 C Bus Operation - Serial EEPROM - Analog to Digital Converter - UART - Baud Rate - Data Handling - Initialization - Special features - Serial Programming - Parallel Slave Port.

UNIT-III: EMBEDDED MICROCOMPUTER SYSTEM

Motorola MC68H 11 Family Architecture - Registers - Addressing Modes Programs - Interfacing Methods - Parallel I/O Interface - Parallel Port Interface - Memory Interfacing - High Speed I/O Interfacing - Interrupts- Interrupt Service Routine - Features of Interrupts - Interrupt Vector - Priority - Timing Generation & Measurement - Input capture - Output Compare - Frequency measurement - Serial I/O Devices - RS 232, RS485 - Analog Interfacing - Applications.

UNIT-IV: SOFTWARE DEVELOPMENT

Round Robin - Round Robin with Interrupts - Function - Queue Scheduling Architecture & Algorithms - Introduction to - Assemblers, Compliers, Cross Compliers, Integrated Development environment(IDE) - Object Oriented Interfacing - Recursion - Debugging Stragies - Simulators.

UNIT-V: REAL TIME OPERATING SYSTEM

Task & Task States - Tasks & Data - Semaphores & Shared Data - Operating System Services - Message Queues - Timer Functions - Event Memory Management - Interrupt Routines & RTOS Environment - Basic design Using RTOS.

TEXT BOOKS:

1. David E. Simon - An Software Primer - Pearson Education Asia 2001.
2. Dreamtech Software team - "Programming for Embedded Systems" - Wiley dreamtech - 2002.
3. John B Peatman - Design with PIC Microcontroller - Pearson Education Asia - 1998.
4. Onartthan W. Valvano - Embedded Micro Computer System - Real Time Interfacing - Thomson Learning 2001.

REFERENCE BOOKS:

1. Burns, Alan & Wellings - Real Time Systems & Programming Languages – 2nd Edition - 1997.
2. A Guide to 32 bit Embedded Development - Real Time Programming - Grehan Moore & Cyliax - Addison Wesley - 1998.
3. Heath Steve - Embedded System Design - Newnes - 1997.

ACCOUNTING AND FINANCIAL MANAGEMENT

PURPOSE

Provide fundamental knowledge on accounting statements and financial analysis related with management operations.

INSTRUCTIONAL OBJECTIVES

It covers balance sheet preparation, ratio analysis, Break Even Analysis And Marginal Costing with budgetary control system related in the filed of management operations

UNIT-I : PRINCIPLES OF ACCOUNTING

Principles of Double Entry - Journalising, Ledger, Preparation of Trial Balance, Preparation of Simple final accounts with adjustments.

UNIT-II ANALYSIS AND INTERPRETATION OF FINANCIAL STATEMENTS

Ratio Analysis - Uses of ratios in interpreting the financial statements - Final Accounts to Ratio as well as Ratios to Final Accounts - Problems.

UNIT-III: BREAK EVEN ANALYSIS AND MARGINAL COSTING

Meaning of variable cost and Fixed cost, Cost - Volume Profit Analysis - Calculation of Break Even Point, Profit Planning, Sales Planning and other Decision making analysis involving Break Even Analysis - Computer accounting and algorithm (Differential Cost analysis to be omitted).

UNIT-IV: BUDGET AND BUDGETARY CONTROL

Preparation of Financial budgets - Production, Sales, Purchases, Cash and Flexible Budgets.

UNIT-V: PROJECT APPRAISAL

Capital Investment Decision-Making: Pay Back Method, ARR Method - Discounted Cash Flow - Methods including Net Present Value and IRR Method.

BOOKS FOR STUDY:

1. Shukla M.C. and Grewal T.S. - Advanced Accounts - S. Chand and Co. - New Delhi 1991.
2. Kuchhal S.C.- Financial Management - Chaitanya - Allahabad - 1980
3. Hingorani N.L. and Ramanathan A.R. - Management accounting - Sultan Chand - New Delhi 1982
4. Ramachandran T- Accounting and Financial Management - Scitech and Co. Chennai 2001

GROUP B ELECTIVIES

WEB TECHNOLOGY

PURPOSE

The purpose is to familiarize the students with different approaches for creating client side and server side programming.

INSTRUCIONAL OBJECTIVES

At the end of the course, student should be able to understand

- Common Gateway Interface Programming
- Socket Programming
- Server Side Programming • On-line Applications

UNIT-I : INTRODUCTION

Basic Web Concepts - How the web server works - How scripting languages work - Client/Server Model - Retrieving data from Internet - HTML and Scripting Languages - Standard Generalized Markup Language - Protocols and applications.

UNIT-II : HTML

HTML forms - CGI Concepts - HTML tags Emulation - Server Browser Communication - E-mail Generation - CGI Client side Applets - CGI Server Side Applets - Authorization and Security.

UNIT-III : NETWORKING

Streaming - Networking Principles - Sockets - Protocol Handlers - Content Handlers - Multicasting - Remote Method Invocation - Activation - Serialization - Marshal Streams.

UNIT-IV: SIMPLE APPLICATIONS

Simple Applications - Online Databases - Monitoring user events - Plug-ins - Database Connectivity - Internet Information Systems - EDI application in business - Internet commerce - Customization of Internet commerce.

UNIT-V: XML

What is a Markup Language - Well Formed Documents - Valid Documents - Writing DTDs - Styling XML - XML Parsers - W3C Document Object Model - Creating XML documents from a Web Page - Creating XML from a Relational Database - Data Binding.

TEXT BOOKS:

1. Chris Bates - "Web Programming" - Wiley dreamtech - 2002.
2. Jason Hunter, William Crawford - "JAVA Servlet Programming" - O'Reilly Publications - 1999.
3. Chris Ullman et al. - "Beginning ASP 3.0"- Wrox Publications - 2000.

REFERENCE BOOKS:

1. Ravi Kalakota and Andrew B Whinston- "Frontiers of Electronic Commerce" - Addison Wesley -1996.
2. Eric Ladd, Jim O'Donnel -"Using HTML 4, XML and JAVA" - PHI - 1999. 3. Jeffy Dwight,Michael Erwin and Robert Niles - "Using CGI" -PHI - 1999.

COMPONENT BASED DEVELOPMENT

PURPOSE

The purpose is to enable the readers to develop the effective component models.

INSTRUCIONAL OBJECTIVES

At the end of the course, student should be able to understand

- COM proxies and stub
- Interfaces used in DCOM
- Services of DCOM
- Broadcasting and Multicasting • Triggering
- Message passing and Message Queuing

UNIT-I : COM

COM - Application - Client-Server - IDL(Interface Definition Language) - MIDL Compiler - Proxies and Stubs - Variables - Type Library - Idispatch - About ActiveX - The Component Market - Tools.

UNIT-II: DCOM

DCOM & other Types of Middleware-Main Concepts used in DCOM- GUID-Classes, Objects and Components-CLSID-Interface-Polymorphism and EncapsulationInheritance-Interface Containment and Aggregation-IUnknown Interface-Monikers.

UNIT-III: MAIN SERVICES OF DCOM

The Main Services of DCOM- RPC-MS RPC and DCOM-MS RPC and DCE RPCCedar-What about Data Conversions-Triggering-Context Bridging-Broadcasting and Multicasting.

UNIT-IV: DCOM AND INTERNET

DCOM and the Internet-How do Other Middleware Vendors Provide Internet Support-An Overview of the Services Provided with MTS-Buffer Pool Management-Automatic Multithreading-Load Balancing-Shared Property Manager.

UNIT-V: MSMQ

MSMQ - Message Passing Vs Message Queuing - What is MSMQ - MSMQ Information Store - Queues - Polling, Pulling and Notification - Message Prioritization - Message Content - Session Handling.

TEXT BOOK

1. Rose Mary et al.- "DCOM Explained" - Digital Press - 1998.

REFERENCE BOOKS

1. Dale Rogerson- "Inside COM" -Microsoft Press - 1997.
2. Thuan L. Thai- "Learning DCOM" - O'Reilly Associates Inc. - April 1998.

FAULT TOLERANT SYSTEM

PURPOSE

It provides knowledge on fault tolerance system architecture, software and applications.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Fault tolerance system operations
- Fault tolerance system architecture
- Fault tolerance system software
- Applications of Fault tolerance system

UNIT-I: INTRODUCTION

Fault Prevention and tolerance - Anticipated and unanticipated Faults- Test generation for digital systems- Combinational logic network- Boolean difference method-Test generation for sequential circuits- Fault simulation-Coding theory for fault tolerant systems. Error Model: Basic structural properties of parity check codes-General coding scheme - Parity checking code- Arithmetic code - Code for computer memories - Checking errors in logical operation - Communication coding.

UNIT-II: FAULT TOLERANCE

Coding techniques in fault tolerant-Self checking and fail safe circuits-Fault tolerant in combinatorial and sequential circuits- Synchronous and asynchronous fail safe circuits.

UNIT-III : ARCHITECTURE

Architecture of Fault tolerant computers: Quadraplex systems - General purpose commercial systems-Fault tolerant multiprocessor and VLSI based communication architecture-N version programming.

UNIT-IV: FAULT TOLERANT SOFTWARE

Software Design-Recovery block -Construction of acceptance tests-Fault trees-validation of fault tolerant systems.

UNIT-V: APPLICATIONS

Application to commercial system - Performance evaluation - Reliability estimation-Aircraft systems - Aircraft common mode failures.

BOOKS FOR STUDY:

1. Pradhan K.K.- Fault Tolerant computing theory and techniques" - Vol. III - Prentice Hall - 1989.
2. Anderson and Lee - Fault Tolerant principles and practice - PHI - 1989.

ARTIFICIAL NEURAL NETWORKS

PURPOSE

Providing a clear and detailed knowledge of basic neural network architectures, algorithms and applications of various standard neural networks is the purpose of this course.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Neuron models
- Multilayer Networks
- Recurrent Networks
- Applications of Neural Networks

UNIT-I : INTRODUCTION

The brain as a Neural Networks - Basic properties of Neurons - Neuron models.

UNIT-II : FEED FORWARD NETWORKS

Rosenblatt's Perception - LMS Algorithm - Order of a predicate and a perception - Multilayer Networks: Exact and approximate representation using Feed forward Networks - Fixed multilayer Feed forward Network training by back propagation - Structural training - Unsupervised and reinforcement learning - The Probabilistic Neural Networks.

UNIT-III: RBF NETWORKS & PCA

Radial-Basis function Networks : Cover's theorem - Interpolation Problem - Regularization theory - Regularization Networks - Generalized RBF Networks - XOR Problem - Properties of RBF Networks.Principal Component analysis : Some intuitive principles of self organization - Principal Component analysis - Hebbian_based PCA - PCA Algorithms - Markov chains.

UNIT-IV: RECURRENT NETWORKS

Symmetric Hopfield Networks and associate memory - Unsupervised Competitive Learning - Adaptive resonant Networks - Self Organizing features maps - Hybrid Learning.

UNIT-V: APPLICATIONS

Traveling Salesperson problem - Multitarget tracking - Time series prediction - Talking Network and phonetic typewriter - Autonomous vehicle Navigation - Handwritten digit Navigation - Image Compression - Character retrieval - Visual processing Networks.

TEXT BOOKS:

1. Bose N. K. & Liang P. - "Neural Network Fundamentals" - McGraw Hill - 1996.
2. Simon Haykin - "Neural Networks " - PHI - 1999.

REFERENCE BOOKS:

1. Mohamad H. Hassoun - "Fundamentals of Artificial Neural Networks" – PHI 1998.
2. Schalkoff R.J.- "Artificial Neural Networks" - McGraw Hill - 1997.
3. Limin Fu - "Neural Networks in Computer intelligence" - McGraw Hill -1994.

E-COMMERCE

PURPOSE

This course provides a basic understanding and appreciation of Electronic Commerce while highlighting the frame work necessary for its operations. Also explores the potential of E-commerce in Intra-organizational commerce and EDI.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Electronic Payment System
- Firewalls and Network Security
- Internet and Web site Establishment
- Value added networks

UNIT-I :ELECTRONIC COMMERCE ENVIRONMENT AND OPPORTUNITIES

Background - The Electronic Commerce Environment - Electronic Marketplace Technologies - Modes of Electronic Commerce: Overview - Electronic Data Interchange - Migration to Open EDI - Electronic Commerce with WWW/Internet - Commerce Net Advocacy - Web Commerce Going Forward - Types of Electronic Commerce.

UNIT-II: ELECTRONIC PAYMENT SYSTEMS: OVERVIEW OF THE ELECTRONIC PAYMENT TECHNOLOGY

The Online Shopping Experience - Limitations of traditional Payment Instruments - Electronic or Digital Cash - Electronic Checks - Online Credit Card-based systems - Home Banking Implementation and Approaches

UNIT-III: FIREWALLS AND NETWORK SECURITY

Types of Firewalls - Firewall Security Policies - Emerging Firewall Management Issues - Transaction Security: Types of Online Transactions - Requirements for Transaction security - Encryption and Transaction Security: Secret-Key Encryption - Public-Key Encryption - Implementation and Management Issues - World Wide Web and Security: Netscape's Secure Sockets Layer - Security and Online Web-based Banking.

UNIT-IV: INTERNET AND WEB SITE ESTABLISHMENT

Introduction - Technologies for Web servers - Internet Tools Relevant to Commerce - Internet Applications for Commerce - Internet Charges - Interne Access and Architecture - Searching the Internet - Internet Resources: A Travelogue of web

mails: Introduction - A Shopping experience - A travelogue - Applications : Advertising on the Internet : Issues and Technologies : Introduction - Advertising on the Web - "Marketing 101" - Creating a Web site

UNIT-V: INTRAORGANIZATIONAL COMMERCE AND EDI

Electronic Data Interchange - EDI Applications in Business - EDI:Legal, Security and Private Issues - EDI and Electronic Commerce - Standardization and EDI - EDI Software Implementation - EDI Envelope for Message Transport - Value Added Networks - Internet-based EDI

TEXT BOOKS:

1. Daniel Monoli & Emma Minoli - Web Commerce Technology Handbook – Tata McGraw Hill - 1999.
2. Kalakota & Whinston - Frontiers of Electronic Commerce - Pearson Education - 1999.
3. Kalakota & Whinston - Electronic Commerce-A Manager's Guide - Pearson Education - 2000.

REFERENCE BOOKS:

1. Bajaj K.& Nag D.- E-Commerce - Tata McGraw Hill - 1999.
2. David Whiteley - Electronic Commerce: Strategy, Technologies and Applications - McGraw Hill - 2000.

SOFTWARE AGENTS

PURPOSE

The Software Agent course help the professionals to learn about the impact of software agents in various software systems and processes and how they are promoting organized software engineering development process. And also deals with the various security issues and decision support systems and importance of frameworks.

OBJECTIVES

The course content includes the following

1. Java Agents (Javabeans, RPCs, Jini Architecture)
2. Organization, cooperation, coordination and negotiation of Software agents
3. Decision support systems
4. Knowledge based representation and Robotics

UNIT-I: INTRODUCTION

Agents definition - Software Systems - Programming paradigms - Autonomous mobile and immobile robots - Agent frameworks and reasoning - Specific agents - Data mining and knowledge recovery - smart interactive systems - Decision support systems - Design and Manufacturing systems

UNIT-II: THEORETICAL FOUNDATIONS

Theoretical foundations for software agents - Java Agents - Processes - threads - components - javabeans, - Remote method invocation and distributed processing - Jim architecture

UNIT-III: DESIGNING INTELLIGENT AGENTS

Designing intelligent agents - reactive agents - cognitive agents - protocol interactions - knowledge based - logical rational commutative and adaptive learning agentscoordination, negotiation, cooperation and organization of agents

UNIT-IV: DESIGNING MULTI AGENTS

Designing multi agents - Agents communication language and knowledge representation - Tools used - Mobile agent applications - Agents in E commerce applications.

UNIT-V: AUTHENTICATION AND SECURITY ISSUES

Authentication and Security issues - Protecting agents - Un trusted agents - Black box security

TEXT BOOKS:

1. Bradshaw (ed.), " Software Agents", MA: MIT Press, 2000
2. Bigus and Bigus " Constructing intelligent agents with Java", John Wiley, 1999
3. Russel and Novirg, " Artificial Intenlligence : A Modern approach, New York, Prentice Hall, 1995

REFERENCE BOOKS:

1. Huhns and Singh(ed), Palo Alto. CA, "Readings in Agents", Morgan Kaufinann,1998
2. Richard Murch, Tony Johnson, " Intelligent Software Agents", Prentice Hall, 2000.

CREATIVE THINKING

PURPOSE

This course provides creative thinking on problem solving techniques

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Problem solving skills, techniques
- The way to improve memory
- Four quadrant brain model of thinking
- Mental Barrier to Creative Thinking
- Incubation & Creative idea evaluation

UNIT-I : INTRODUCTION

Benefits of creative thinking and problem -solving skills; definitions and comparison of problem-solving techniques-the problem of change and paradigm shift. Visualization & Memory: Memory and the brain mental Language - visualization- a way to improve memory; sketching a tool for conceptual thinking and visualization applications and impact of visualization -application and impact of visualization.

UNIT-II: THE FOUR QUADRANT BRAIN MODEL OF THINKING PREFERENCE

Development of four quadrant model of thinking preferences-characteristics of analytical quadrant A- sequential quadrant-sequential quadrant B -Interpersonal quadrant C imaginative quadrant; thinking -whole brain thinking and creative problem solving - organizational implications of whole brain thinking and learning Overcoming Mental Barrier to Creative Thinking: Barriers to creative thinking-false assumptions-habits, attitudes and emotions-recognizing and encouraging thinking.

UNIT-III: PROBLEM DEFINITION

The real problem - data collection and problem analysis- the detectives mindset; The context of the problem-the explorer's mindset -the briefing document and problem definition statement. Incubation: Introspection and purging- hands-on activity for problem definition. Idea Generation, Brainstorming and Teamwork: Teamwork and team management -verbal brainstorming - other brainstorming methods.

UNIT-IV: CREATIVE EVALUATION JUDGEMENT AND CREATIVE THINKING

Creative idea evaluation - the engineer's mindset- idea judgement -ranking ideas decision making-critical thinking and creative problem solving. Solution Implementation: Putting ideas into action -the producer's mindset-selling your idea- the work plan and implementation; implementation, monitoring and final project evaluation-time management - a cure for procrastination.

UNIT-V: COMPUTER AND CREATIVE THINKING

Computer as thinking tool-computers and learning mathematics using mathematica, mathematica and creative problem solving. The Pugh Method: Creativity in product and process design-economic benefits of pugh method-overview of pugh matrix and procedure-examples of other pugh method exercise and applications. Communication and Creative Problem Solving: Communications-getting your point across in thirty seconds-negotiation-copying with difficult people -communicating in cyberspace. Culture, Technology, Invention and Patents: Culture- Technology- invention in the historical context- creative problem solving and inventing patents - inventors and inventions. Exercise for creative thinking.

TEXT BOOKS:

1. **Edward Lumsdaince and Monika Lumsdaince- Creative Problem Solving - Thinking Skills for a Changing World'- McGraw Hill Inc. - 1994**
2. **Pradip N Khadwalla - "Excellence through Creativity - Fourth Eye" - Wheeler Publishing Company - 2000.**

REFERENCE BOOKS:

1. **Alex F. Osborn - " Applied Imagination" - Scribner Pub. - 1979.**

SYSTEM ANALYSIS AND DESIGN

PURPOSE

This course provides the technical foundations for system design implementation hardware and software requirement and computing resource management.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to

- Manage application development environment
- Specify application requirements
- Develop prototypes
- Select software and hardware for applications

UNIT-I : INTRODUCTION

Introduction to Information Systems Development - System Analyst - Categories of Information System - System Development Strategy - Classical System Development Life Cycle - Structured Analysis Development Method - Tools for System Development. Managing the Application Development Portfolio - Information Systems Planning Methodologies - Managing Project Review and Selection - Preliminary Investigation - Selecting the Project Development Strategy.

UNIT-II : REQUIREMENT ANALYSIS

Requirement Analysis and Determination - Activities and Requirements Determination - Basic Requirements - User Transaction Requirements - User Decision Requirements - Organisation wide Requirements - Fast Finding Techniques - Tools for Documenting Procedures and Decisions. Structured Analysis Development Strategy - Features of Data Flow Strategy - Tools for Data Flow Strategy - Developing Data Flow Diagram - Features of Data Dictionary - Application Prototype Development Strategy - Computer Aided System and Tools.

UNIT-III: SYSTEM DESIGN

System Design : The Analysis-to-Design Transition : Specifying Application Requirements - Objectives in Designing an Information System - Output Design - Design of Input and Control - Design of On-line Dialogue - Design of Files and Use of Auxiliary Storage Devices - Design of Database Interaction - Design of Data Communications. Structured Design : Basic Principles - Objectives of Structured Design - The Structure of Computer Programs - Structure and Procedure - Coupling - Cohesion.

UNIT-IV: IMPLEMENTATION

Implementation, Developing Management and Selection of Hardware and Software - System Engineering and Quality Assurance - Managing System Implementation - Managing Information System Development - Hardware and Software Selection.

UNIT-V: CASE STUDIES

Case Studies to Illustrate the Theories Covered in this Paper : A Manufacturing firm, a service Organization, Super Market System and an Educational Institutions.

TEXT BOOK:

1. James a. Senn " Analysis and Design of Information System " - McGraw Hill Publishing Company, 1989.

REFERENCE BOOKS:

1. Perry Edwards, " System Analysis and Design", Mitchell McGraw Hill, 1983.
2. Edward Yourdon, " Modern Structured Analysis", Prentice Hall Inc., 1989.

GROUP C ELECTIVIES

PARALLEL PROGRAMMING

PURPOSE

The purpose is to provide the technical foundation for different computations of parallel computing like message passing computing pipelined computations and synchronous computations

INSTRUCIONAL OBJECTIVES

At the end of the course, student should be able to understand :

- Types of parallel computers
- MPI Architecture
- Pipelined Techniques
- Synchronization Techniques
- Load Balancing and Termination Techniques

UNIT- I : PARALLEL COMPUTERS

The Demand for Computational Speed - Types of Parallel Computers -Shared Memory Multiprocessor System-Message-Passing Multicompute,-Distributed Shared MemoryMIMD and SIMD Classifications

UNIT-II: MESSAGE-PASSING COMPUTING

Basics of Message-Passing Programming -Programming Options-Process Creation-Message-Passing Routines- Using Workstation Clusters -Software Tools-PVM-MPI-Pseudocode Constructs- Evaluating Parallel Programs -Parallel Execution Time-Time Complexity-Comments on Asymptotic Analysis-Time Complexity of Broadcast/Gather.

UNIT-III: PIPELINED COMPUTATIONS

Pipeline Technique - Computing Platform for Pipelined Applications - Pipeline Program Examples -Adding Numbers-Sorting Numbers.

UNIT-IV: SYNCHRONOUS COMPUTATIONS

Synchronization - Barrier-Counter Implementation - Tree Implementation-Butterfly Barrier-Local Synchronization-Deadlock- Synchronized Computations -Data Parallel Computations-Synchronous Iteration- Synchronous Iteration Program Examples.

UNIT-V: LOAD BALANCING AND TERMINATION DETECTION

Load Balancing - Dynamic Load Balancing - Centralized Dynamic Load Balancing-Decentralized Dynamic Load Balancing-Load Balancing Using a Line Structure-Distributed Termination Detection Algorithms -Termination Conditions-Using Acknowledgment Messages-Ring Termination Algorithms-Fixed Energy Distributed Termination Algorithm.

TEXT BOOK:

1. Barry Wilkinson, Michael Allen - "Parallel Programming - Techniques and applications using networked workstations and parallel computers" - Prentice Hall - 1998.

REFERENCE BOOKS:

1. Crichlow - "Introduction to Parallel & Distributed Computing" - PHI - 1999.
2. Hwang.K. - "Advanced Computer Architecture, Parallelism, Scalability, Programmability" - TMC - 1994.

CLIENT / SERVER INFORMATION SYSTEMS

PURPOSE

This course takes the students through all aspects of client/server architecture including internet and web based technology. Also give an expensive coverage of LAN, WAN and wireless networking.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Client/Server Architectures & Infrastructures
- Groupware and Middleware
- Integration of Internet, Intranet and Web based technologies
- Remote Access and Wireless Networking

UNIT-I: CLIENT/SERVER ARCHITECTURES & INFRASTRUCTURES

Introduction - Business aspects - Client/Server information system analysis, design and implementation - Logical and Physical architectures - Technology and tools - Overview of Client hardware and Client Software.

UNIT-II : GROUPWARE AND MIDDLEWARE

Groupware - Introduction - Components of groupware - Groupware market analysis - Groupware trends. Middleware - Introduction - Need - Architecture - Application based and Communication based middleware categories.

UNIT-III : INTEGRATION OF INTERNET, INTRANET AND WEB BASED TECHNOLOGIES

Introduction - Internet- Intranet- Extranet - A Client/Server technology for Internet connectivity - Integrating Internet, Internets and Extranets - Application development Environments - Application Deployment.

UNIX-IV: LAN & WAN

LAN and Os - Network Os Architecture - Client Network OS functionality - Client Networks OS technology analysis - Server Network OS functionality - Server network OS technology analysis. WAN: Introduction - Basic Principles of WAN - WAN switching - WAN transmission - WAN Services.

UNIT-V: REMOTE ACCESS AND WIRELESS NETWORKING

Introduction - Business issues - Architectural issues - Remote access technology - Network Services.

TEXT BOOKS:

1. Goldman.J.E., Rawles P.T. & Mariga J.R. - "Client/Server information systems" - John wiley & Sons Inc.-1998.
2. Alex Berson - "Client/Server Architectures" - McGraw Hill, 1992.

REFERENCE BOOKS:

1. Joel P. Kanter - "This Client/Server Computing" Microsoft press - 1998.
2. Jeffrey J. Schank - "Client/Server Applications and Architecture" - BPB pub, 1994.
3. Robert orfali & Dan Harkey - "Client/Server Programming with Java & Cobra" - Wrox press - 2003.

MOBILE AND WIRELESS NETWORK

PURPOSE

This course will give a good understanding of the rapidly revolving field of mobile communication system, their services, standards, architecture, planning, equipment vendors and the network operators.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the student should be able to understand

- Digital Wireless technologies
- Personal communication
- Digital Audio and Video broadcasting
- Wireless transmission and application

UNIT-I : INTRODUCTION

Introduction to Mobile & Wireless Communication: Applications - Fundamentals of Wireless Communication : Radio wave & Light wave system - Wireless transmission: Frequency for radio tx - signals - antennas - signal propagation - multiplexing - modulation - spread spectrum - Digital wireless technologies : digital wireless system - comparison with analog wireless system - vocoders - TDMA - CDMA - GSM.

UNIT-II: CELLULAR COMMUNICATIONS

Cellular Communication : Evolution of Cellular technology-Dynamics of Cellular tx-cellular components-cellular coverage&channels-routing cellular points-using cellular communication for disasters. Wireless Personal Communication:Definition for personal communication-cordless telephone technology-concepts of PCS/PCN-functions of PCSEvolution of Personal Communication-Comparing PCS&Cellular technologies

UNIT-III: BROADCAST SYSTEMS

Broadcast systems: Introduction -cyclic repetition of data-Digital audio broadcasting-Digital video broadcasting. Wireless LAN:Infrared vs radio transmission-Infrastructure of Adhoc network-IEEE 802.11-HIPERLAN-Bluetooth. Wireless ATM:ATM Working group &services-Reference model-Functions-Radio access layer-Handover-Location management-Addressing-Mobility QOS-Access point control protocol

UNIT-IV: MOBILE NETWORK LAYER

Mobile Network Layer : Mobile ip-DHCP-Adhoc network. Mobile Transport layeraraditianol TCP-Indirect TCP-Snooping TCP-Mobile TCP-Fast retransmit/fast

recovery-Transmission/timeout freezing-Selection transmission-Transaction oriented TCP.

UNIT-V: SUPPORT FOR MOBILITY

Support for mobility: WWW-WAP-Filesystems. Wireless Applications: Wireless lan, wireless Ian in disaster recovery mode:infrared light system,using infrared for disaster recovery system-Wireless pbx&wireless pbx in disaster recovery mode-Wireless data-Wireless email&wireless email in disaster recovery mode

TEXT BOOKS:

1. Jochen schiller - "Mobile communication" - Addison Wisley - 2001.
2. Regis J. Bates, Bud Bates - "Wireless Networked Communication", - McGrawHill, 1994.

REFERENCE BOOKS:

1. Paul Bedell - "Wireless crash course" - McGrawHill, 2001.
2. Rifaat A Dayem - "Mobile data &wireless LAN technologies" - Prentice Hall of India, 1997.
3. Dr.Kamilo Feher - "Wireless digital communication" - Prentice Hall of India, 1995. 4. Roy Blake & Paula Collins - "Wireless communication technology " – Delmar Learning - 2000.

REAL TIME SYSTEM

PURPOSE

The purpose of this subject is to impart knowledge on real time system architecture and operations to the students.

INSTRUCTIONAL OBJECTIVIES

At the end of this course, the students should be able to understand :

- Uniprocessor Scheduling
- Various real time systems
- Preemptive systems

UNIT-I : UNIPROCESSOR SCHEDULING OF INDEPENDENT TASKS

Introduction to real time systems -Examples - Real time applications - Hard Vs soft real time - Reference model .

UNIT-II: CLASSIC UNIPROCESSOR SCHEDULING RESULTS

Static scheduling-Cyclic executives-Dynamic scheduling - Dynamic-priority scheduling : Optimality of EDF and LLF-Utilization-based schedulability test for EDF - Nonpreemptive EDF from - Static-priority scheduling - Optimality of RM and DM - Utilization-based schedulability test for RM - Demand-based scheduling conditions for static - priority systems - Dealing with complexities arising in real systems - rations - Timing analysis.

UNIT-III: SOME REAL SYSTEMS

Basic operating system functions needed for real-time computing - A brief survey of commercial real-time and non-real-time operating systems. Intractability results : Preemptive systems - Dynamic-priority systems - Static-Priority Systems. Nonpreemptive Systems - Dynamic-priority systems- Static-priority systems. A bullet-list survey of known results about uniprocessor scheduling.

UNIT-IV: UNIPROCESSOR INDEPENDENT TASK MODELS AND MOTIVATION

Uniprocessor Independent Task Models inheritance and priority ceiling protocols, under EDF - Lock-free approach. Resource sharing - Motivation : Priority stack resource protocol - Resource sharing

UNIT-V: MIXING REAL-TIME AND NON-REAL-TIME

Introduction - Deferrable servers - Sporadic servers. Constant utilization and total bandwidth servers. Fairness: Proportional - share scheduling - Pfair scheduling. Multiprocessors and distributed systems : Multiprocessor priority ceiling protocol-End-toend scheduling.

TEXT BOOKS:

1. Jane Liu - "Real-time Systems" - Prentice Hall, 2000.
2. Krishna C.M. and Shin K.G. - "Real-Time Systems" - McGraw Hill - 1996

REFERENCE BOOKS:

1. Stimler.S - "Real time data Processing Systems" - McGraw Hill -1969
2. Philip A.Laplante - "Real time systems -Design and Analysis" - PHI - 2001.

DIGITAL IMAGE PROCESSING

PURPOSE

The rationale behind the structure of this course is to understand the construction, enhance and analyze digital image

INSTRUCIONAL OBJECTIVES

At the end of the course, student should be able to

- Transform Images
- Compress and Restore Images
- Recognize and interpret images
- Segment the Images

UNIT-I : INTRODUCTION

Fundamental steps in Image Processing - Elements of Digital Image Processing - Elements of visual perception - Simple image Model - Sampling and Quantization - basic relationship between pixels - image geometry - photo film

UNIT-II: IMAGE TRANSFORMATION

Fourier Transform - Two dimensional Fourier transform - Fast Fourier transform - Separable Image Transform - Hotelling Transform. Image Enhancement - Spatial domain method, frequency domain method - Enhancement by point processing - Spatial Filtering - enhancement in the frequency domain - color image processing.

UNIT-III: IMAGE RESTORATION

Degradation Model – Diagonalization of circulant and block - circulant matrices - algebraic approach to restoration - inverse filtering - Least Mean Square (Wiener) Filter - Constrained Least Squares Restoration - Interactive restoration - geometric transformation . Image compression fundamentals - Image compression model - Elements of Information theory - Error Free Compression - Image compression Standards

UNIT-IV: IMAGE SEGMENTATION

Detection of Discontinuities - Edge linking and boundary Detection - thresholding - region - oriented segmentation - use of motion in segmentation - Representation and description - Representation Schemes - Boundary Descriptors - Regional Descriptors - Morphology

UNIT-V: RECOGNITION AND INTERPRETATION

Elements of Image Analysis - patterns and pattern classes - Decision - theoretic methods - Structural Methods - Interpretation.

TEXT BOOK:

1. Rafael C. Gonzalez, Richard E. Woods - Digital Image Processing - Addison Wesley-2000

REFERENCE BOOKS:

1. Anil K. Jain - Fundamentals of Image Processing - Prentice Hall of India Private Ltd. - 1988
2. Sid Ahmed - Image Processing - McGraw Hill - 1995.

VIRTUAL REALITY SYSTEM

PURPOSE

Introduction to the use of simulated environments as a component of education/training programs. Topics include a historical review of simulation, instructional design principles applied to virtual reality as a tool for instruction, current constraints in both stand-alone and networked systems, and future possibilities for simulated learning environments.

INSTRUCTIONAL OBJECTIVES

At the end of this course, the students should be able to understand :

- Virtual reality environments
- 2D and 3D geometric modeling
- Computer Animation Techniques
- Various Applications of virtual reality system

UNIT- I : VIRTUAL REALITY AND ENVIRONMENTS

Introduction- Computer Graphics - real - time computer graphics - flight simulation - virtual environments - requirements - benefit of virtual reality. The historical development of virtual reality: Scientific landmarks 3D computer Graphics: Virtual world space - positioning the observer - Perspective projection - human vision - stero perspective projection - human vision stereo perspective projection - 3D clipping - color theory - 3D modeling - illumination - reflection models - shading algorithms - hidden surface removal - stereo graphic images.

UNIT-II: GEOMETRIC MODELING

Conversion form 2D to 3D - 3D space curves -- 3D boundary representation- modeling strategies. Geometric transformations: Frames of reverences - modeling transformationsInstance - Picking- flying - Scaling the virtual environment - Collision Detection. Generic virtual Reality : virtual Environment - Computer Environment - Virtual reality Technology - Models of interaction - Virtual Reality Systems.

UNIT-III: ANIMATION

The Dynamics of number - animation of Objects - shape and object in betweening - frame- form deformation - particle systems. Physical simulation : Objects falling in the gravitational field - rotating wheels - elastic - collision - project tiles- simple pendulums - springs - flight Dynamics of an aircraft Human Factor : eye- ear-somatic senses - equilibrium.

UNIT-IV: VIRTUAL REALITY HARDWARE

Sensor Hardware - head - Coupled displays - Acoustic hardware - integrated Virtual Reality Systems. Virtual Reality Software: Modeling virtual worlds - Physical simulation - Virtual Reality tool kits.
UNIT-V: VIRTUAL REALITY APPLICATIONS Engineering - Entertainment - Science - Training. Future of Virtual Reality : Virtual Environments - Modes of Interaction.

BOOKS FOR STUDY:

1. John Vince - "Virtual Reality Systems" - Addison Wesley - 1999.
2. Adams - "Visualizations of Virtual Reality" - Tata McGraw Hill - 2000.
3. Joe Gradecki - "Virtual Reality Construction Kit " - John Wiley & Sons - 1994.

SOFTWARE TESTING

PURPOSE

Success in software development is tested through user satisfaction and usability testing. So it becomes mandatory to learn Software Testing Techniques and its various levels to become IT professionals.

INSTRUCTIONAL OBJECTIVES

The syllabi of "Software Testing " is designed to learn

- Testing strategies
- Testing Levels
- Impact of Object orientation on testing
- Deriving test cases and Planned test standards
- Web based testing
- Preparation of Test document
- Automated test tools

UNIT-I : INTRODUCTION

Software Quality control - Software testing - Test cases - Test plans - Need for planned testing - Testing strategies - White box Testing: statement coverage, branch coverage, conditional and multi conditional coverage, Data flow testing - Black box Testing: Boundary value analysis, Equivalence partitioning - Levels of Testing - SDLC testing - Testing metrics

UNIT-II: TESTING OBJECT ORIENTED SOFTWARE

Testing Object oriented software - differs from procedural approach - Class testing - Inheritance testing - API testing for Object oriented programming - Use case testing - Object oriented Test Metrics - Patterns and tools

UNIT-III : GUI TESTING

GUI Testing - Windows testing - User Interface and Interaction testing - Testing for Multi window systems - Usability and User satisfaction test - Test document preparation - Control over documentation - Reliability testing

UNIT-IV: CLIENT SERVER TESTING

Client server testing - Testing web based applications - Stress testing - Testing compilers and languages - Continuous Testing - Need of Continuous testing - Real time testing

UNIT-V: AUTOMATED TESTING TOOLS

Automated testing tools - state code analyzers - Software Maintenance - Reliability engineering - Component based testing - Test reusability - Quality motivation - Quality management paradigm - Establish software quality paradigm

TEXT BOOKS:

1. William E. Perry - "Effective methods for software testing, John wiley and sons , 2000
2. Boris Beizer, "Software testing techniques", John wiley and sons and 1995.
3. Glenford J. Myers, " The Art of Software Testing", John wiley and sons, 1979

REFERENCE BOOKS:

1. Roger S. Pressman - Software Engineering A Practicioner's approach - Mc Graw Hill- 2001.
2. Robert V. Binder, "Testing object oriented systems : Models patterns and tools", - Addison wesley, 2000

ENTERPRISE RESOURCE PLANNING

PURPOSE

The purpose is to impart knowledge on Enterprise Resource Planning concepts and ERP packages

INSTRUCTIONAL OBJECTIVES

At the end of this course, the student should be able to understand :

- Business Modeling for ERP
- SAP applications
- Commercial ERP packages
- Architectural concepts

UNIT-I : INTRODUCTION TO ERP

Integrated Management Information Seamless Integration-Supply Chain Management Integrated Data Model- Benefits Of Erp-Business Engineering And ERP- Definition Of Business Engineering- Principle of business engineering- Business engineering with information technology.

UNIT-II: BUSINESS MODELING FOR ERP

Building The Business model - ERP implementation - an Overview - Role Of Consultant, Vendors and Users, Customisation- Precautions- ERP Post implementation options ERP Implementation Technology - Guidelines for ERP Implementation.

UNIT-III: ERP AND THE COMPETITIVE ADVANTAGE

ERP domain MPGPRO - IFS/Avalon- Industrial and financial systems- Baan IV SAP - Market Dynamics and dynamic strategy.

UNIT-IV: COMMERCIAL ERP PACKAGE

Description - Multi- client server solution- Open technology- User Interface-Application Integration.

UNIT-V: ARCHITECTURE

Basic architectural Concepts- The system control interfaces- Services-Presentation interface - Database Interface.

TEXT BOOKS:

1. Vinod Kumar Garg and N.K.Venkita Krishnan, Enterprise Resource PlanningConcepts and Practice, PHI, 1998.

REFERENCE BOOKS:

1. Jose Antonio Fernandz, The SAP R/3 Handbook, TMH,1998.

.NET FRAMEWORK & C#

PURPOSE

This course provides the concepts of the C# language and the .NET framework.

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to understand:

• The student will gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.
• The student will gain programming skills in C# both in basic and advanced levels.
• By building sample applications, the student will get experience and be ready for large-scale projects.

UNIT I INTRODUCTION TO C#

Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II OBJECT ORIENTED ASPECTS OF C#

Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III APPLICATION DEVELOPMENT ON .NET

Building Windows Applications, Accessing Data with ADO.NET.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET

Programming Web Applications with Web Forms, Programming Web Services.

UNIT V THE CLR AND THE .NET FRAMEWORK

Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

TEXT BOOKS:

1. E. Balagurusamy, “Programming in C#”, Tata McGraw-Hill, 2004. (Unit I, II)
2. J. Liberty, “Programming C#”, 2nd ed., O’Reilly, 2002. (Unit III, IV, V)

REFERENCE BOOKS:

1. Herbert Schildt, “The Complete Reference: C#”, Tata McGraw-Hill, 2004.
2. Robinson et al, “Professional C#”, 2nd ed., Wrox Press, 2002.
3. Andrew Troelsen, “C# and the .NET Platform”, A! Press, 2003.
4. S. Thamarai Selvi, R. Murugesan, “A Textbook on C#”, Pearson Education, 2003.

Semester V

DESIGN AND ANALYSIS OF ALGORITHMS

CST501

Objective of the course: This course gives insight into the design and analysis for selected problems.

Unit 1: Introduction - Definition of Algorithm – pseudocode conventions – recursive algorithms – time and space complexity –big-"oh" notation – practical complexities – randomized algorithms – repeated element – primality testing - Divide and Conquer: General Method - Finding maximum and minimum – merge sort.

Unit 2: Divide and conquer contd. – Quicksort, Selection, Strassen's matrix multiplication – Greedy Method: General Method –knapsack problem - Tree vertex splitting - Job sequencing with dead lines – optimal storage on tapes.

Unit 3: Dynamic Programming: General Method - multistage graphs – all pairs shortest paths – single source shortest paths - String Editing – 0/1 knapsack. Search techniques for graphs – DFS-BFS-connected components – biconnected components.

Unit 4: Back Tracking: General Method – 8-queens - Sum of subsets - Graph Coloring – Hamiltonian cycles. Branch and Bound: General Method - Traveling Salesperson problem.

Unit 5: Lower Bound Theory: Comparison trees - Oracles and advisory arguments - Lower bounds through reduction - Basic Concepts of NP-Hard and NP-Complete problems.

1. Recommended Texts

(i) E. Horowitz, S. Sahni and S. Rajasekaran, 1999, Computer Algorithms, Galgotia, New Delhi.

2. Reference Books

(i) G. Brassard and P. Bratley, 1997, Fundamentals of Algorithms, PHI, New Delhi.

(ii) A.V. Aho, J.E. Hopcroft, J.D. Ullmann, !974, The design and analysis of Computer Algorithms, Addison Wesley, Boston.

(iii) S.E.Goodman and S.T.Hedetniemi, 1977, Introduction to the Design and Analysis of algorithms, Tata McGraw Hill Int. Edn, New Delhi.

3. Website, E-learning resources

http://www.cise.ufl.edu/~raj/BOOK.html

Semester V

OPERATING SYSTEM

CST 502

PURPOSE :
This course will cover the tradeoffs that can be made between performance and functionality during the design and implementation of an operating system. Particular emphasis will be given to three major OS subsystems : Process management processes, threads, CPU scheduling, synchronization, and deadlock, memory management segmentation, paging, swapping, file systems.

INSTRUCTIONAL OBJECTIVES
At the end of the course, student should be able to understand :

- Various Scheduling techniques
- Storage and Management concepts
- Page replacement Algorithms
- Deadlock detection, avoidance and recovery.

UNIT – I
Introduction – what is an OS-OS structures-Process management –Process concept Process scheduling – Operation on processes – Co-operating processes – Threads – Inter process.

UNIT – II
CPU scheduling – Basic concepts – Scheduling criteria – scheduling algorithms - process synchronization – The critical section problem – semaphores – classical problems of synchronization – monitors – synchronization in Solaris.

UNIT – III
Storage management – Memory management – Logical Vs Physical address space – Swapping – Contiguous allocation – Paging – Segmentation – Virtual memory – Demand paging – Page replacement – Page replacement algorithms – Thrashing.

UNIT – IV
Deadlocks – Deadlock characterization – Preventions – Deadlock avoidance. Detecion recovery from Deadlock – Protection and security : Protection – goals of protection – Domain of protection – Security – Security problem authentication – Encryption.

UNIT – V
File system interface – file concept – access methods – directory structure – protection – file system implementation – I/O systems – secondary storage section – disk structure – disk scheduling - disk management – disk reliability – Case study – UNIX and Windows NT system.

TEXT BOOK :

1. Silberschatz Galvin – "Operating system concepts" – 5th Edition – John Wiley & Sons -2001

REFERENCE BOOKS :

1. Milan Milenkovic – "Operating System Concepts and Design" – McGraw Hill – 1992.
2. Andrew S. Tennenbaum – "Modern Operating System" – PHI – 2001.
3. Deital – "An Introduction to Operating System" – Pearson Education – 2002.

Semester V

UNIX INTERNALS

CST503

PURPOSE

This course is to ofer knowledge about unix file system, shell programming and device drivers.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the students should be able to :

- Understand unix file system and process control operations.
- Write shell scripts for various applications
- Write unix device and the operation of the unix kernel that is practical and accessible.

UNIT – I : INTRODUCTION TO UNIX

Commands – filters – I/O redirection – file permissions – editors – shell programming – Unix system structure – Kernel – Kernel Architecture and data structure.

UNIT – II : FILE SYSTEM

Buffer cache – Buffer headers – Retrieval of a buffer – reading and writing disk blocks – Internal representation of files – Inodes – directories – blocks – file types – Various system calls for file system.

UNIT – III : PROCESSES

Process status and transitions - context – address space – process control operations process scheduling - system calls for time and clock.

UNIT – IV : DEVICE DRIVERS

Introduction – purpose – controllers – overview of block and character devices Routines within a device drivers – Guidelines for writing device drivers.
Simple character device drivers : Kernel interface - Transferring data between user & device driver and device & device driver – Mechanism to schedule execution of device drivers – parallel printer driver.

UNIT – V : MORE ON DEVICE DRIVERS

Interrupts – arrival of interrupts in a device driver – XXintr routine – sleepk and wakeupk – line disciplines 0 and serial device drivers – Introduction to streams, Block device drivers and raw device drivers.

TEXT BOOKS :

1. Maurice J. Bach – "The design of the Unix operating system" – PHI – 1999.
2. Peler Kettle and Steve Statler – "Writing Device drivers for SCO Unix – A Practical Approach" – Addision Wesley – 1993.

REFERENCE BOOKS :

1. Leffler S.J., McKusick M.K., Karels M.J. and Quaterman J.S. – "The Design and Implementation of the 4.3. BSD Unix Operating System" – Addison Wesley – 1998.
2. Goodheart B., Cox.J. – " The magic Garden Explained" – PHI – 1994.
3. Chirstopher Vickery – "Unix Shell Programmer's interactive workbook" – PHI – 1998.

Semester V

COMPUTER GRAPHICS

CST504

PURPOSE

The purpose of this course is to impart knowledge on computer graphics to the students from the basics and to motivate the students to develop applications using computer graphics

INSTRUCTIONAL OBJECTIVES

At the end of the course, student should be able to :

- Understand Graphical User Interface concepts
- Understand the applications Data Visualizaiton, motion pictures, music video television pictures and many other applications.
- Incorporate physics principles into 3D graphics algorithms
- Know image processing techniques
- Develop Graphics packages like GKS Graphical Kernel System, PHIGS Programmer's Hierarchical Interactive Graphics Standard, and a variety of painting, drawing and design packages.

UNIT – I : GRAPHICS SYSTEM AND OUTPUT PRIMITIVES

Graphics applications – Video display devices – Raster scan systems – Random scan systems – I/O devices – Graphics software – O/P primitives : Points and Lines – Line drawing algorithm – Circle and Ellipse generating algorithms – Filled area Primitives – Character Generations.

UNIT – II : 2D TRANSFORMATIONS AND VIEWING

Translation – Rotations – Scaling - Reflection - Shearing – Matrix representations – Composite transformation – Viewing : Viewing Pipeline – Window to Viewport coordinate transformation – Line Clipping algorithm – Polygon clipping algorithms.

UNIT – III : STRUCTURES, MODELING AND INTERACTIVE INPUT METHODS

Structure concepts – Modeling Concepts – Modeling transformations – The user dialogue – Input of graphical data - Input functions - Interactive picture construction techniques - Virtual reality environments -Segments : Segment Table – Segment Creation, closing, deleting and Renaming.

UNIT – IV : 3D TRANSFORMATION AND VIEWING

Translation – Rotation – Scaling - Reflection – Shearing – Composite transformations – Viewing Pipeline – Viewing coordinates – Parallel and Perspective Projections – View volumes – Clipping.

UNIT – V : VISIBLE SURFACE DETECTION METHODS

Back-Face detection – Depth-Buffer method – Scanline method – Depth sorting method – Area subdivision method – Basic illumination models – Polygon – Rendering methods – Color models – Design of animation sequences - Key frame systems – Morphing – Motion specifications – Bezier Curves.

TEXT BOOK :

1. Donald Hearn & Pauline Baker – Computer Graphics – PHI – 1994.

REFERENCE BOOKS :

1. Foley J.D, Van Dam A, Feiner S.K, Hughes J.F – Computer Principles and Practice – Addison Wesley Publications – 1993.
2. Steven Harrington – Computer Graphics – McGraw Hill – 1986.
3. Newman W.M. & Sproull R.F. – Principles of Interactive Computer Graphics – International student Edition – McGraw Hill – 1979.

Semester V

VISUAL PROGRAMMING

CST505

Objective of the course: This course introduces the basic concepts of Visual Programming.

Unit 1: Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.

Unit-2: Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.

Unit 3: Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.

Unit-4: VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.

Unit-5 : Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop

1. Recommended Texts

(i) Gary Cornell, Visual Basic 6 from the Ground up, Tata McGraw-Hill, 1999.

(ii) Noel Jerke, Visual Basic 6 (The Complete Reference), Tata McGraw-Hill, 1999.

2. Reference Books

(i) B. Siler and J. Spotts, Special Editor using Visual Basic 6, PHI, 2001.

Semester V

PRACTICAL VIII

CST506

(Unix & Graphics Lab)

PURPOSE

This course is to offer practical knowledge in unix and shell programming techniques and also in computer graphics.

INSTRUCTIONAL OBJECTIVES

At the end of the course, the students should be able familiar with :

- Unix commands
- Shell scripts for various applications
- Graphics primitives like generation of circle, line, etc.,
- 2D and 3D transformations
- Clipping and windowing

LIST OF EXERCISE

I UNIX & SHELL PROGRAMMING

a. Basic commands.
b. Filters – grep family, cut, dd and sort.
c. Awk programming
d. Piping
e. Shell Programs

1. Programs for the use of the following.
   i) if & and nested if
   ii) case
   iii) loop structures – while & for
2. Implementing Which command.
3. Catching interrupts
4. Find and replace a text
5. Command line arguments

II GRAPHISCS EXPERIMENTS

1. Output Primitives
   a. Bresenhaum's algorithms for drawing line, circle & ellipse
   b. Graphics Primitives – Line, Circle & Box
2. Transfermation, Clipping and Windowing
   a. 2D Transfromations
   b. 3D Transformations
   c. Clipping and Windowing

REFERENCE BOOKS :

1. Maurice J. Bach – “The design of the Unix operating system” – PHI – 1999
2. Chirstopher Vickery – “Unix Shell Programmer’s interactive workbook” – PHI – 1998.
3. Donald Hearn & Pauline Baker – Computer Graphics – PHI – 1994.

Semester V

PRACTICAL IX

(VISUAL PROGRAMMING LAB)

CST507

Objective of the course	This course gives training in design and implementation of data bases for the selected problems.

Create database and performing the operations given below using a Menu Driven Program : (a) Insertion, (b) Deletion, (c) Modification, (d) Generating a reports (Simple) for the following System using Visual Basic as a Frontend and Oracle as a Backend :

1. Payroll
2. Mark Sheet Processing
3. Savings Bank Account for Banking
4. Inventory System
5. Invoice System
6. Library Information System
7. Student Information System
8. Income Tax Processing System
9. Electricity Bill Preparation System
10. Telephone Directory Maintenance.