RULES AND REGULATIONS
B. E. /B. Tech. Programmes
(for the batches of candidates admitted in 2007-2008 and onwards)

1. Conditions for Admission

Candidates for admission to the B.E. / B.Tech. degree programme will be required to satisfy the conditions of admission thereto prescribed by the Anna University, Coimbatore and the Government of Tamil Nadu.

2. Duration of the Programme

The programme will lead to the Degree of Bachelor of Engineering (B.E.) / Bachelor of Technology (B.Tech.) of the Anna University, Coimbatore and extend over a period of four years. The four academic years will be divided into eight semesters with two semesters per year.

3. Branches of Study

The following are the branches of study in B.E. / B. Tech. programmes.

B. E.

Branch I	Civil Engineering
Branch II	Computer Science and Engineering
Branch III	Electrical and Electronics Engineering
Branch IV	Electronics and Communication Engineering
Branch V	Electronics and Instrumentation Engineering
Branch VI	Mechanical Engineering
Branch VII	Aeronautical Engineering

B. Tech.

Branch I	Biotechnology
Branch II	Information Technology
Branch III	Textile Technology
Branch IV	Textile Technology (Fashion Technology)

4. Curriculum

(i) The curriculum will comprise courses of study and syllabi as prescribed by the respective Boards of Studies from time to time.

(ii) Every candidate will be required to opt for electives from the list of electives relating to his/her branch of study.

(iii) Every candidate will be required to undertake a suitable project work in industry / department in consultation with the Head of the Department and the faculty guide and submit the project report thereon at the end of the final semester on dates announced by the College/Department. Also, he/she will be required to present two seminars about the progress of the project work during each of semesters 7 & 8 as given in section 12 infra.

(iv) A candidate can register for Self-Study Elective(s) from any branch of engineering and technology one per semester starting from V semester onwards provided he/she maintains a CGPA of 7.5 or above till the previous semester.

5. Requirements of Attendance and Progress

(i) A candidate will be deemed to have completed the requirements of study of any semester only if:

(a) he / she has kept not less than 50% of attendance in each course and at least 75% of attendance on an average in all the courses in that semester put together.

However, a candidate who has secured attendance between 65% & 74% in the current semester due to medical reasons (hospitalization / accident/ specific illness) or due to participation in College/ University/ State/ National/ International level sports events with prior permission from the Principal shall be given exemption from the prescribed attendance requirements and he/she shall be permitted to appear for the current semester examinations.

(b) his/her progress has been satisfactory, and
(c) his/her conduct has been satisfactory.

(ii) Candidates who do not satisfy the requirement to undergo 40 hours of NSS / NCC / YRC / YOGA/ Sports and Games activities (section 10 infra) during the first year will not be permitted to appear for the final examinations of semester 3 onwards. Such candidates are permitted to appear for the final examinations of semester 3 onwards only after completing the above mentioned requirement.

(iii) Candidates who do not qualify to appear for final examinations of any semester for want of attendance and/or progress and/or conduct have to register for and redo that semester programme at the next available opportunity subject to the approval of Director of Technical Education and Anna University, Coimbatore.

6. Procedure for Completing the Course

(i) For purposes of these regulations, the academic year will be normally spanning the period from June to April. Each academic year will be divided into two semesters, the odd semester normally spanning the period from June to October and the even semester the period from November to April.

(ii) The course work of the odd semesters will ordinarily be conducted only in odd semesters and that of the even semesters only in even semesters.

(iii) A candidate will be permitted to proceed to the courses of study of any semester only, if he/she has satisfied the requirements of attendance and progress in respect of the preceding semester and had registered for the highest semester examination for which he / she was eligible to register.

(iv) A candidate who is required to repeat the study of any semester for want of attendance/ progress/conduct or who desires to rejoin the course after a period of discontinuance or who upon his/her own request is permitted by the authorities to repeat the study of any semester,

may join the semester which he/she is eligible or permitted to rejoin, only at the time of its normal commencement for a regular batch of candidates and after obtaining the approval from the Director of Technical Education and Anna University. No candidate will however be enrolled in more than one semester at any time. In the case of repeaters, the earlier assessment in the repeated courses will be disregarded.

v) A candidate will be permitted to proceed to the fifth semester, only if he/she has passed the examinations in all the courses of the first and second semesters. A candidate will be permitted to proceed to the seventh semester, only if he/she has passed the examinations in all the courses of the first four semesters.

7. Assessment

(i) The assessment will comprise of final examination and/or continuous assessment, carrying marks as specified by Clause12.

(ii) Final examinations will normally be conducted during October/November and during March / April of each year. Supplementary examinations may also be conducted at such times as may be decided by the College.

(iii) Continuous assessment marks will be awarded on the basis of continuous evaluation made during the semester as per the rules given in section 12 infra.

Credit assignment: Each course is normally assigned a certain number of credits with 1 credit per lecture hour per week, 1 credit per tutorial per week, 1 credit for 2 hours of practical (2 credits for 3 or 4 hours of practical) and the credits for the Project Work will be as prescribed by the respective Boards of Studies.

(iv) The letter grade and the grade point are awarded based on percentage of marks secured by a candidate in individual course as detailed below:

Range of Percentage of Total Marks	Letter grade	Grade Point (g)
90 to 100	S	10
80 to 89	A	9
70 to 79	B	8
60 to 69	C	7
55 to 59	D	6
50 to 54	E	5
0 to 49 or less than 50% in final examination	F	0
Incomplete	I	0
Withdrawal	W	0

"F" denotes failure in the course.
"I" denotes incomplete as per clause 5 (i) & (ii) and hence prevented from writing final examination.
"W" denotes withdrawal from the final examination.

After completion of the programme, the Cumulative Grade Point Average (CGPA) from the first semester / (third semester in case of lateral entry) to final semester is calculated using the formula:

$$CGPA = \frac{\sum g_i * C_i}{\sum C_i}$$

where g_i : Grade point secured corresponding to the course

C_i : Credits allotted to the course.

(v) A candida+te will be permitted to appear for the examination of a semester only if he/she has completed the study of that semester (vide section 5 supra). A candidate will not be allowed to register for any semester final examination unless he/she simultaneously registers for the examinations of the highest semester eligible and all the courses which he/she be in arrears of. In the case of examination in project work, no candidate will be permitted to appear at the project work examination unless he /she had submitted the project report not later than the prescribed date.

8. Passing Requirements and Provisions

(i) The minimum number of total credits to be earned by a candidate to qualify for the award of degree in the various branches of study as prescribed by the respective Boards of Studies is given below:

B.E./B. Tech. Programmes	Total Credits
B.E. Civil Engineering	240
B.E. Computer Science and Engineering	228
B.E. Electrical and Electronics Engineering	232
B.E. Electronics and Communication Engineering	236
B.E. Electronics and Instrumentation Engineering	234
B.E. Mechanical Engineering	234
B.E. Aeronautical Engineering	235
B.Tech. Biotechnology	232
B.Tech. Information Technology	232
B.Tech. Textile Technology	231
B.Tech. Textile Technology (Fashion Technology)	231

(ii) A candidate who secures a minimum of 50% marks in the final examination and a grade point 5 or more in any course of study will be declared to have passed that course.

(iii) A candidate, who absents or withdraws or disqualified as per clause 5 (i) & (ii) or secures a letter grade F (Grade point 0) or less than 50% in final examination in any course carrying internal assessment and final examination marks, will retain the already earned internal assessment marks for two subsequent attempts only in the examination of that course and thereafter he/she will be solely assessed by final examination carrying the entire marks of that course. A candidate who absents or secures a letter grade F (Grade Point 0) in any course carrying only continuous assessment marks, will retain the internal assessment marks earned

for two subsequent attempts only and thereafter he / she will be solely assessed by final examination carrying the entire marks of that course, the continuous assessment marks obtained earlier being disregarded.

(iv) A candidate who lacks in attendance or who fails to submit the report on the final semester project work (or whose report is not accepted for reasons of incompleteness or other serious deficiencies) within the prescribed date or whose project work and viva-voce has been assessed as grade F, will have to reregister at the beginning of a subsequent semester following the final semester, redo and submit the project report at the end of that semester and appear for final examination.

(v) A candidate shall be declared to have qualified for the award of the B.E./B.Tech. Degree provided the candidate has successfully completed the course requirements and has passed all the prescribed courses of study in all the 8 semesters (6 semesters for lateral entry) within a maximum period of 7 years (6 years for lateral entry) reckoned from the commencement of the semester to which the candidate was first admitted.

(vi) A candidate who qualifies for the award of the Degree (vide clause 8 (v) supra) having passed all the courses of study of all the eight semesters (six semesters for lateral entry candidates) at the first opportunity within eight consecutive semesters (six consecutive semesters for lateral entry candidates) after the commencement of his /her study and securing a CGPA of 8.00 and above shall be declared to have passed in **First Class with Distinction**. For this purpose the withdrawal from examination (vide section 9 infra) will not be construed as an opportunity for appearance in the examination.

(vii) A candidate who qualifies for the award of the Degree (vide clause 8 (v) supra) having passed all the courses of study of all the eight semesters (six semesters for lateral entry candidates) within eight consecutive semesters (six consecutive semesters for lateral entry candidates) after the commencement of his /her study and securing a CGPA of 6.50 and above shall be declared to have passed in **First Class**.

(viii) All other candidates who qualify for the award of the degree shall be declared to have passed in **Second Class**.

(ix) A candidate who is absent in final examination in a course / project work after having registered for the same shall be considered to have appeared and failed in that course / project work and awarded grade F.

(x) If a candidate fails to submit the report on project work not later than the date specified by the college / department, he/she is deemed to have failed in the project work and awarded grade F.

9. Withdrawal from the Examination

(i) A candidate may, for valid reasons, be granted permission to withdraw from appearing for the examination in any course or courses of only one semester examination during the entire duration of the degree programme. Also, only ONE application for withdrawal is permitted for that semester examination in which withdrawal is sought.

(ii) Withdrawal application shall be valid only if the candidate is otherwise eligible to write the examination and if it is made prior to the commencement of the examination in that course or courses and also recommended by the Head of the Department.

(iii) Withdrawal shall not be construed as an opportunity for appearance in the examination for the eligibility of a candidate for First Class with Distinction.

10. Personality and Character Development

All candidates shall enroll, on admission, in any one of the personality and character development activities (NCC / NSS / YRC/Yoga/Sports and Games) and undergo training for 40 hours during the first year.

- **National Cadet Corps (NCC)** will have parades.
- **National Service Scheme (NSS)** will have social service activities in and around the College.
- **Youth Red Cross (YRC)** society activities will include peace time activities like health and hygiene, international friendship, awareness camps, etc.
- **Sports and Games** will include preparation for inter-collegiate sports events.
- While the training activities will normally be during week ends, the camps will normally be during vacation period.
- **Yoga**

11. Class Advisor

To help the students in planning their courses of study and for general advice on the academic programme, the Head of the Department of the students will attach a certain number of students to a teacher of the Department who shall function as Tutor for those students throughout their period of study. Such Tutor shall advise the students and monitor the courses undergone by the students, check the attendance and progress of the students attached to him/her and counsels them periodically. If necessary, the faculty adviser may also discuss with or inform the parents about the progress of the students through the Head of the Department concerned**.**

11. (a) CLASS COMMITTEE

(i) A Class Committee consists of teachers of the concerned class, student representatives and a chairperson who is not teaching the class. It is like the 'Quality Circle' (more commonly used in industries) with the overall goal of improving the teaching-learning process. 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 programme and the details of rules therein
- Informing the student representatives the academic schedule including the dates of assessments and the syllabus coverage for each assessment
- Informing the student representatives the details of regulations regarding the weightage used for each assessment. In the case of practical courses (laboratory / 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.
- Analyzing 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.

(ii) The class committee for a class under a particular specialization normally constituted by the Head of the Department. However, if the students of different specializations are mixed in a class, the class committee is to be constituted by the Head of the Institution.

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

(iv) At least 2 student representatives (usually 1 boy and 1 girl) shall be included in the class committee.

(v) The chairperson of the class committee may invite the Faculty adviser(s) and the Head of the department to the meeting of the class committee

(vi) The Head of the Institution may participate in any class committee of the institution.

(vii) The chairperson is required to prepare the minutes of every meeting, submit the same to the Head of the Institution within two days of the meeting and arrange to circulate among the concerned students and teachers. If there are some points in the minutes requiring action by the management, the same shall be brought to the notice of the management by the head of the institution.

(viii) 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 the Regulations. Two or three subsequent meetings may be held at suitable intervals. During these meetings 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.

11 (b) COURSE COMMITTEE

Each common theory course offered to more than one group of students shall have a "Course Committee" comprising all the teachers teaching the common course with one of them nominated as Course Coordinator. The nomination of the course Coordinator shall be made by the Head of the Department / Head of the Institution depending upon whether all the teachers teaching the common course belong to a single department or to several departments. The 'Course committee' shall meet as often as possible and ensure uniform evaluation of the tests and arrive at a common scheme of evaluation for the tests. Wherever it is feasible, the course committee may also prepare a common question paper for the test(s).

12. Course of Study and Scheme of Assessment
Sessional Scheme of Evaluation

(a) The Sessional Scheme of Evaluation followed for I Semester of the 2007 Batch during the Academic year 2007–2008 is as given below.

THEORY

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Assignment	05	
Test 1	10	
Test 2	10	
Test 3	15 (A Model Test covering the entire syllabus)	
	40 (to be converted to 50)	

PRACTICAL

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Preparation	10	
Conduct of Experiment	15	
Observation & Analysis of Results	25	
Record	30	

A Model Test & Viva-voce	20
	100 to be reduced to 50

Note: No passing minimum in Internal Assessment

(b) The Sessional Scheme of Evaluation followed for the II Semester of the 2007 Batch during the Academic Year 2007–2008 is as given below.

THEORY

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Assignment / Seminar	10	
Test 1	10	
Test 2	10	
Test 3	20	(A Model Test covering the entire syllabus)
	50	

PRACTICAL

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Preparation	10	
Conduct of Experiment	15	
Observation & Analysis of Results	25	
Record	20	
A Model Test & Viva-voce	30	
	100	to be reduced to 50

(c) Sessional scheme of evaluation to be followed from the III Semester of 2007–2008 Batch and from I Semester of the 2008–2009 Batch is as given below.

THEORY

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Assignment / Tutorial	05	
Test 1	10	
Test 2	10	
Test 3	15	(A Model Test covering the entire syllabus)
Innovative Presentation	10	
	50	

Note: Innovative Presentation includes Seminar / Quiz / Group Discussion / Case Study / Soft Skill Development / Mini Project / Review of State-of-the-art.

PRACTICAL

Internal Assessment: 50 Marks		Final Examination: 50 Marks
Preparation	10	
Conduct of Experiment	15	
Observation & Analysis of Results	25	
Record	20	
A Model Test & Viva-voce	30	
	100	to be reduced to 50

Scheme of Assessment for Theory Courses carrying only Continuous Assessment and no Final Examination to be followed from the III Semester of 2007 Batch and from I Semester of the 2008 and subsequent Batches is as given below.

THEORY: Total 100 Marks

Internal Assessment: 50 Marks	
Assignment/Tutorial	10
Test 1	15
Test 2	15
Innovative Presentation	10
	50

At the end of the semester a model test covering the entire syllabus has to be conducted and assessed for 50 marks by the Course Teacher.

PROJECT WORK

Review: 50 Marks **Report & Viva-Voce: 50 Marks**

Review of Mini Project / Project includes two presentations to be made by individual student or a group of students carrying out the project work and assessment be made on the presentation. Marks per presentation = 25

TECHNICAL SEMINAR : 100 Marks

Three Seminars (3 X 25) : 75 Marks

Report	: 25 Marks

INDUSTRIAL TRAINING	**: 100 Marks**
2 Weeks Visit	: 30 Marks
Report	: 30 Marks
Viva-Voce	: 40 Marks

The industrial training is not assigned any credits and hence not considered for calculation of CGPA. However, based upon the marks scored, the performance will be rated as follows and will be indicated in the grade sheet.

Marks	Rating
≥ 90	Excellent
80-89	Very good
70-79	Good
50-69	Satisfactory
< 50	Not satisfactory

The Question Paper pattern (for Theory Examination) to be followed for UG Courses is given below:

Max. Marks: 100

Time: 3 Hours

PART A

Short Answer Questions: 10	(10 X 2 Marks)	20
(Two Questions from each unit)		

PART B

Long Answer Questions: 5	(5 X 16 Marks)	80
(One from each unit, either Or type)		
	Total	100

B. E. COMPUTER SCIENCE AND ENGINEERING

First Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07G101	Engineering Mathematics – I*	3	2	0	4
07G102	Engineering Physics*	3	0	0	3
07G103	Engineering Chemistry*	3	0	0	3
07G104	'C' Programming*	3	0	0	3
07Z105	Basics of Civil and Mechanical Engineering♥	4	0	0	4
07Z106	Fundamentals of Computers	3	0	0	3
07G001	Communication Skills I **	3	0	0	3
07G108	'C' Programming Laboratory*	0	0	3	2
07Z109	Engineering Physics Laboratory$	0	0	2	1
07Z110	Engineering Chemistry Laboratory$	0	0	2	1
	Total	**22**	**2**	**7**	**27**

Second Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07G201	Engineering Mathematics II*	3	2	0	4
07G202	Environmental Science and Engineering*	3	0	0	3
07G203	Object Oriented Programming*	3	0	0	3
07Z204	Semi Conductor Physics and Opto Electronics	3	1	0	4
07Z205	Basics of Electrical and Electronics Engg.♦	3	1	0	4
07Z206	Digital Systems	3	0	0	3
07G002	Communication Skills II**	3	0	0	3
07G208	Object Oriented Programming Laboratory*	0	0	3	2
07Z209	Engineering Graphics#	2	0	3	4
07Z210	Workshop Practice#	0	0	2	1
	Total	**23**	**4**	**8**	**31**

* Common to all branches of B.E./B.Tech.
♥ Common to ECE, EEE, CSE, TT, FT, IT, BT & EIE
$ Common to FT, CE, BT, CSE, TT & ME (first semester); ECE, EEE, EIE, IT (second semester)
♦ Common to FT, BT, IT, ME & CE
Common to ECE, EEE, EIE, IT (first semester); FT, CE, BT, CSE, TT & ME (second semester)
** Common to all branches of B. E./B. Tech and evaluation by continuous assessment

Third Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07G301	Engineering Mathematics III*	3	2	0	4
07Z302	System Software	3	0	0	3
07Z303	Electrical Circuits and Machines	3	1	0	4
07Z304	Data Structures	3	1	0	4
07Z305	Instrumentation and Control	3	0	0	3
07Z306	Software Engineering	3	0	0	3
07G003	Professional Ethics**	3	0	0	3
07Z308	System Software Laboratory	0	0	3	2
07Z309	Data Structures Laboratory	0	0	3	2
07Z310	Electrical Machines and Control Laboratory	0	0	3	2
	Total	**21**	**4**	**9**	**30**

Fourth Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07Z401	Probability and Queuing Theory	3	2	0	4
07Z402	Computer Architecture	3	0	0	3
07Z403	Java Programming	3	0	0	3
07Z404	Operating System	3	1	0	4
07Z405	Database Management System	3	0	0	3
07Z406	Design and Analysis of Algorithms	3	1	0	4
07G003	Professional Communication**	2	0	2	3
07Z408	Operating Systems Laboratory	0	0	3	2
07Z409	Database Management System Laboratory	0	0	3	2
07Z410	Java Programming Laboratory	0	0	3	2
	Total	**20**	**4**	**11**	**30**

* Common to all branches of B.E./B. Tech.

** Common to all branches of B. E./B. Tech and evaluation by continuous assessment

Fifth Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07Z501	Discrete Mathematics	3	1	0	4
07Z502	Computer Graphics	3	0	0	3
07Z503	Unix Internals	3	0	0	3
07Z504	Theory of Computation	3	1	0	4
07Z505	Object Oriented Analysis and Design	3	1	0	4
07Z506	Microprocessors	3	0	0	3
07G005	Engineering Economics**	3	0	0	3
07Z508	Computer Graphics Laboratory	0	0	3	2
07Z509	Object Oriented Analysis and Design Laboratory	0	0	3	2
07Z510	Microprocessors Laboratory	0	0	3	2
	Total	**21**	**3**	**9**	**30**

Sixth Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07Z601	Artificial Intelligence	3	0	0	3
07Z602	Compiler Design	3	1	0	4
07Z603	Software Testing	3	0	0	3
07Z604	Free and Open Source Software	3	0	0	3
07Z605	Computer Communication Networks	3	0	0	3
	Elective	3	0	0	3
07G006	Total Quality Management**	3	0	0	3
07Z608	Computer Communication Networks Laboratory	0	0	3	2
07Z609	Compiler Design Laboratory	0	0	3	2
07Z610	Technical Seminar	0	0	3	2
	Total	**21**	**1**	**9**	**28**

** Common to all branches of B. E./B. Tech and evaluation by continuous assessment

Seventh Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07Z701	Cryptography and Network Security	3	0	0	3
07Z702	Web Technology	3	0	0	3
07Z703	Visual Programming Using VC++	3	0	0	3
07Z704	Software Quality Assurance	3	0	0	3
	Elective	3	0	0	3
	Elective	3	0	0	3
07G007	Creativity and Innovation**	3	0	0	3
07Z708	Web Technology Laboratory	0	0	3	2
07Z709	Visual Programming Laboratory	0	0	3	2
07Z710	Project Phase I	0	0	6	3
	Total	**21**	**0**	**12**	**28**

Eighth Semester					
Code No.	**Course**	**L**	**T**	**P**	**C**
07Z801	TCP/IP	3	0	0	3
	Elective	3	0	0	3
	Elective	3	0	0	3
07G008	Organizational Behavior and Management**	3	0	0	3
07Z805	Project Phase II	0	0	24	12
	Total	**12**	**0**	**24**	**24**

** Common to all branches of B. E./B. Tech and evaluation by continuous assessment

List of Electives:

Sixth Semester:

07Z001	Multimedia Systems
07Z002	Data Mining and Warehousing
07Z003	Micro Electromechanical Systems
07Z004	Parallel Processing
07Z005	Fault Tolerant Computing System
07Z006	Advanced Computer Architecture

Seventh Semester:

07Z007	Network Programming
07Z008	Mobile Computing
07Z009	Distributed Computing Systems
07Z010	Genetic Algorithms and Applications
07Z011	Embedded Systems
07Z012	Web Services and XML

Eighth Semester:

07Z013	E - Commerce
07Z014	Software Process Management
07Z015	Enterprise Computing
07Z016	Advanced Java Programming
07Z017	Client Server Computing and Front end Tools
07Z018	Virtual Reality
07Z019	Neural Networks and Fuzzy Systems
07Z020	VLSI Design
07Z021	Software Patterns
07Z022	Grid Computing

Syllabi of

B.E. Computer Science & Engineering

07G101 ENGINEERING MATHEMATICS
vide Civil Engineering 07G101

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07G102 ENGINEERING PHYSICS
vide Civil Engineering 07G102

07G103 ENGINEERING CHEMISTRY
vide Civil Engineering 07G103

07G104 'C' PROGRAMMING
vide Civil Engineering 07G104

BASICS OF CIVIL AND MECHANICAL ENGINEERING

(07T105, 07F105, 07B105, 07E105, 07L105, 07Z105, 07N105 & 07I105)

4 0 0 4

PART A

Unit I

Introduction to Civil Engineering

History and development of Civil Engineering – Scope of Civil Engineering – Functions of Civil Engineers. Construction Materials: Characteristics of good building materials such as stones, bricks, A.C. sheets, G.I. sheets and Ceramic tiles, timber, cement, aggregates and concrete. Surveying: Definition and purpose – classification – Basic principles – Measurement of length by chains and tapes – Calculation of area of a plot – Measurement of bearings and angles using a prismatic compass – Leveling – Contours and their applications.

10 Hours

Unit II

General Concepts Relating to Buildings

Selection of site – Basic functions of buildings – Major components of buildings. Foundations: Purpose of foundation – Bearing capacity of soils – types of foundations. Proper methods of construction of: Brick masonry – Stone masonry – hollow Block masonry. Beams – Lintels – Columns – Flooring – Damp proof course – surface finishes – Doors and windows – Roofing.

10 Hours

Unit III

Importance of Roads

Classification of Highways – Cross sections of water bound macadam, bituminous and cement concrete roads – Traffic signs and signals. Importance of railways - Gauges – Components of a permanent way – Classification of bridges. Stress, Strain, Elastic Constants: Young's Modules, Bulk Modules, Poisson's ratio (no derivation) – simple problems.

10 Hours

PART B

Unit IV

Alternate Sources of Energy

Solar, Wind, Tidal, Geothermal and Ocean Thermal Energy Conversion (OTEC). Power Plant: Classification of Power Plants- Steam - Nuclear, Diesel, Hydro, and Gas Turbine Power Plants. Types of Boilers – Boiler mounting & accessories – Cochran – Locomotive – Bobcock and Wilcox, Lamont boilers differences between fire tube and water tube boiler. Types of turbines- working of a single stage impulse and reaction turbine.

10 Hours

Unit V

Internal Combustion Engines

Classification of IC engines, Main components of IC engines, working of a 4 stroke & 2 stroke petrol & diesel engine, differences between 4 stroke and 2 stroke engine. Refrigeration: Working Principle of vapour compression & vapour absorption system, domestic refrigerator.

10 Hours

Unit VI:

Manufacturing Processes

Casting Pattern, Mould, Moulding Sand –Melting of Cast Iron – Cupola Furnace – Fettling – Casting Defects. Arc & Gas Welding, Soldering & Brazing, Extrusion, Forging, Rolling, & Drawing Processes. Lathe, Drilling & Milling – Types, Operations & Equipments. Classification of Engineering materials, Composition, Mechanical properties and uses of cast iron, mild steel, high carbon steel and high speed steel.

10 Hours

Total: 50 Hours

Textbook:

Shanmugam G., Palanichamy M.S.,"Basic Civil and Mechanical engineering", Tata McGraw Hill Company, New Delhi, 2nd Edition, 2000.

References:

1. Arunachalam N., "Basic Civil Engineering", Pratheba Publishers, Coimbatore, 2nd Edition, 2000.
2. Sarkar B. K.,"Thermal Engineering" Tata McGraw Hill Company, New Delhi.
3. Rao N., "Manufacturing Technology: Foundry, Forming and Welding", Tata McGraw Hill Company, New Delhi, Paperback Edition.
4. Ramesh babu V., "Basic Civil Engineering", Anuratha publishers,Kumbakonam, 2nd Edition, 2001.

07Z106 FUNDAMENTALS OF COMPUTERS

3 0 0 3

Unit I

Introduction to Computers:

Computer basics- Data representation - Data Conversion - Input/output units – Computer memory-Processor.

10 Hours

Unit II

Computer Arithmetic and Architecture:

Binary Arithmetic – Addition – Subtraction – Multiplication - Division-Floating point representation and normalized floating point-logic circuits –computer architecture.

10 Hours

Unit III

Computer Generations and Languages:

Computer language – Assembler – Compiler- high level- Operating system-Unix operating system – Real time systems-Micro computers-Computer generations and Classifications.

10 Hours

Unit IV

Computer Communication and Networks:

Voice and Data Communication –Types, Characteristics, Allocation of communication channels - Physical communication - PSTN - Cellular communication – ATM -Computer Networks.

10 Hours

Unit V

Graphics and Multimedia:
Computer Graphics-Multimedia data acquisition-capturing and compression techniques-Processing-audio signal and speech processing.

10 Hours
Total: 50 Hours

Textbook:

Rajaraman V, "Fundamentals of Computers", 4th Edition, Prentice-Hall of India, 2005.

References:

1. Pradeep K.Sinha and Priti Sinha, "Computer Fundamentals: Concepts, Systems and Applications", BPB Publications, 2005.
2. "Introduction to Information Technology", ITL Education Solutions,2006.
3. Peter Norton "Introduction to Computers", TMH New Delhi, 6th Edition 2006.

07G001 COMMUNICATION SKILLS – I
vide Civil Engineering 07G001

07G108 'C' PROGRAMMING LABORATORY
vide Civil Engineering 07G008

ENGINEERING PHYSICS LABORATORY
(07C109, 07M109, 07T109, 07F109, 07Z109 & 07B109) / (07I209, 07E209, 07L209 & 07N209)

0 0 2 1

List of Experiments:

1. Torsion Pendulum – Determination of Moment of Inertia and Rigidity Modulus of wire.
2. Young's Modulus- Non uniform bending.
3. Lee's disc – Thermal conductivity of a bad conductor.
4. Melde's Apparatus – Frequency determination.
5. Single Optic Lever – Determination of Thickness.
6. Air wedge – Interference-Thickness of a thin wire.
7. Spectrometer- Dispersive power of prism.
8. Traveling microscope - Refractive index of a liquid and solid.
9. Energy Band Gap Apparatus – Determination of E_g of semiconductor diode.
10. LASER- Determination of Wavelength and Particle Size.

Total: 20 Hours

References:

1. Srinivasan. M.N. et al., "A Text Book of Practical Physics" Sultan Chand & Sons.
2. William Charles. J and Sadasivam K. "A Concise Laboratory Manual on Engineering Physics", Vijay Nicole, Chennai, 2006.

ENGINEERING CHEMISTRY LABORATORY
(07C110, 07M110, 07T110, 07F110, 07Z110 & 07B110) / (07I210, 07E210, 07L210 & 07N210)

0 0 2 1

1. Weighing and preparation of standard solutions

Preparation of molar and normal solutions of the following substances - oxalic acid, sodium carbonate, sodium hydroxide, hydrochloric acid.

2. Water Analysis

i. Determination of total hardness, temporary & permanent hardness of water by EDTA method.
ii. Determination of alkalinity in a water sample.

3. pH

To find out the strength of given hydrochloric acid by sodium hydroxide.

4. Conductometry

Conductometric titration of mixture of acids.

5. **Potentiometry**
   Redox titration – Iron Vs. dichromate.

6. **Spectrophotometry**
   To determine the iron content of an unknown solution by thiocyanate method

7. **Flame photometry**
   To determine sodium and potassium in water

8. **Viscometry**
   Determination of molecular weight of a polymer.

9. **Corrosion**
   Determination of corrosion rate by weight loss measurements.

Total: 20 Hours

References:

1. Vogel A.I., "A Text of Quantitative Inorganic Analysis", Seventh Edition, ELBS, London, 2004.
2. Shoemaker D.P., and Garland C.W., "Experiments in Physical Chemistry", First Edition, Mc-Graw Hill, London, 1988.
3. Sivakumar R., and Jayaprakasam R., "A concise laboratory manual on engineering chemistry", Second Edition, Vijay Nicole, Chennai, 2006.

07G201 ENGINEERING MATHEMATICS – II
vide Civil Engineering 07G201

07G202 ENVIRONMENTAL SCIENCE AND ENGINEERING
vide Civil Engineering 07G202

07G203 OBJECT ORIENTED PROGRAMMING
vide Civil Engineering 07G203

07Z204 SEMICONDUCTOR PHYSICS AND OPTOELECTRONICS

3 1 0 4

Unit I

Conducting and Superconducting Materials

Conducting Materials**:** Classical theory - Drude-Lorentz theory - Electrical conductivity- Thermal conductivity- Wiedemann - Franz law- Drawbacks of Classical theory- Quantum theory: Fermi distribution function- Density of energy states. Superconductivity: Superconducting phenomena - Properties of superconductors - Type I & Type II superconductors - High temperature superconductors – Applications.

10 Hours

Unit II

Semiconducting Materials

Intrinsic Semiconductors**:** Carrier concentration- Calculation of density of holes and electrons- Fermi level and its variation with temperature- Mobility and conductivity – Determination of band gap. Extrinsic Semiconductors**:** Expression for carrier concentration - N-type and P-type semiconductors- Variation of Fermi level with temperature and impurity concentration- Hall effect: Theory- Determination of Hall coefficient - Uses.

10 Hours

Unit III

Dielectrics and Magnetic Materials

Dielectrics**:** Basic Definitions: Electrical susceptibility- Dielectric constant-Electronic, ionic, orientation and space charge polarizations- Frequency and temperature dependence of polarization- Internal field, Claussius-Mosotti relation (derivation)-Dielectric loss- Dielectric breakdown- Uses Magnetic Materials: Origin of magnetic moment:

Bohr magneton- Domain theory of ferromagnetism- Hysteresis- Soft and Hard magnetic materials- Ferrites- Applications.

10 Hours

Unit IV

Optoelectronic Switching Devices

Analog and digital modulators: Pulse code modulation, Franz- Keldish and Stark effect modulators- Quantum well – Kerr effect – Pockel's effect- Electro absorption modulators- Optical switching: Self Electro optic Effect Device – Applications. .

10 Hours

Unit V

Optical Materials and Fiber Optics

Optical Materials**:** Disc data storage – Recording and read out of information: CD – ROM, Differences between CD-ROM and floppy disc- Magneto optical recording and read out: Different storage and retrieval techniques. Fiber Optics**:** Principle of light transmission through fiber - Expression for acceptance angle and Numerical Aperture- Types of fibers - Losses in fibers: Attenuation - Dispersion- Light sources for fiber optic communication: LED - Fiber optic communication link- Modulators & Detectors-Fiber amplifiers- Soliton based coherent optical fiber communication.

10 Hours

Total: 50 Hours

Textbooks:

1. Arumugam.M, "Semi conductor Physics And Opto Electronics ", Revised Edition, Anuradha Publications, Kumbokonam, , 2003.
2. Palanisami P.K, "Material Science", Scitech Publications(India),Pvt Ltd, Volume1, 2nd Edition Chennai,June 2003.

References:

1. Pillai S. O., "Solid State Physics", Fifth Edition, New Age International Publications, New Delhi, , 2003.
2. Avadhanulu M.N. and Kshirsagar P.G., "A Text Book of Engineering Physics", 7th Enlarged Revised Edition., Chand & Company Ltd., New Delhi, 2005.
3. Raghavan V, "Materials Science & Engineering," Prentice Hall of India, A first course,.New Delhi, 2001.
4. Rajendran.V & Marikani.A "Materials Science", First Reprint, Tata Mc Graw Hill Publishers Company Ltd, New Delhi, 2004.
5. Palanisami P.K, "Semi conductor Physics And Opto Electronics", Scitech Publications(India), Pvt Ltd, Chennai, 2003.

BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(07C105, 07M105, 07B106, 07I106 & 07F106) / (07Z205)

3 1 0 4

Unit I

Electric Circuits

Definition of Voltage, Current, Power & Energy, Ohm's law, Kirchoff's Law & its applications – simple problems, division of current in series & parallel circuits, generation of alternating EMF, definition of RMS value, average value, peak factor, form factor. Power in single phase AC – three phase system.

10 Hours

Unit II

Magnetic Circuits

Definition of MMF, Flux, Reluctance, Properties of Flux lines, Self & Mutual Inductance, Ampere Turns, Series & parallel magnetic circuits, Comparison between Electric & magnetic circuits, Law of Electromagnetic induction, Fleming's Right & Left hand rule.

10 Hours

Unit III

Electrical Machines

Construction, Type, Principle of Operation & Working Principle of DC Generator, DC Motor, Transformer, Induction Motor, Induction type single phase energy meter, Domestic wiring practice, Tube light circuit, Earthing & earthing methods.

10 Hours

Unit IV

Electronics Engineering

PN Junction diode & Zener diode – Characteristics – Half wave and full wave rectifier – Bipolar junction transistors – CB,CE, CC Configurations and characteristics – basic concepts of amplifiers and oscillators – Logic gates – Inverting, Non inverting amplifiers and Operational amplifiers- Basic Computer organization – Block diagram of Microprocessors (8085)

10 Hours

Unit V

Communication Engineering

Introduction to communication systems – Need for modulation – Types- Block Diagram representation only– Block diagram of TV system – Introduction to cellular & mobile telephony- Block diagram of Optical and Satellite communication systems.

10 Hours

Total: 50 Hours

Textbooks:

1. Nagsarkar T K & Sukhija M S, "Basic of Electrical Engineering", Oxford Press 2005.
2. Muthusubramaninan R, Salivahanan S and Muraleedharan K A, "Basic Electrical, Electronics and Computer Engineering", Tata McGraw Hill, Second Edition 2004.

References:

1. Edminister J A, "Electric Circuits", Schaum's Series. McGraw Hill, 2005
2. Van Valkenbergm, "Electric Circuits and Network Analysis", Prentice Hall (India) Pvt, Ltd, 2005.
3. Smarjith Ghosh, "Fundamentals of Electrical and Electronics Engineering", Prentice Hall (India) Pvt, Ltd, 2005.

07Z206 DIGITAL SYSTEMS

3 0 0 3

Unit I

Number Systems

Binary, Octal, Decimal, Hexadecimal-Number base conversions – complements – signed Binary numbers. Binary Arithmetic- Binary codes: Weighted –BCD-2421-Gray code-Excess 3 code-ASCII –Error detecting code – conversion from one code to another-Boolean postulates and laws –De-Morgan's Theorem- Principle of Duality- Boolean expression – Boolean function- Minimization of Boolean expressions – Sum of Products (SOP) –Product of Sums (POS)-Minterm- Maxterm- Canonical forms – Conversion between canonical forms –Karnaugh map Minimization – Don't care conditions.

10 Hours

Unit II

Logic Gates

AND, OR, NOT, NAND, NOR, Exclusive – OR and Exclusive – NOR- Implementations of Logic Functions using gates, NAND –NOR implementations –Multi level gate implementations- Multi output gate implementations. TTL and CMOS Logic and their characteristics –Tristate gates. Combinational Circuits: Design procedure – Adders- Subtractors – Serial adder/Subtractor - Parallel adder/ Subtractor- Carry look ahead adder- BCD adder- Magnitude Comparator- Multiplexer/ Demultiplexer- encoder / decoder – parity checker – code converters. Implementation of combinational logic using MUX, ROM, PAL and PLA.

10 Hours

Unit III

Sequential Circuit

Flip flops SR, JK, T, D and Master slave – Characteristic table and equation –Application table – Edge triggering – Level Triggering –Realization of one flip flop using other flip flops –Asynchronous / Ripple counters – Synchronous counters –Modulo – n counter –Classification of sequential circuits – Moore and Mealy -Design of Synchronous counters: state diagram- State table –State minimization –State assignment- ASM-Excitation table and maps-Circuit implementation - Register – shift registers- Universal shift register – Shift counters – Ring counters.

10 Hours

Unit IV

Asynchronous Sequential Circuits

Design of fundamental mode and pulse mode circuits – primitive state / flow table – Minimization of primitive state table –state assignment – Excitation table – Excitation map- cycles – Races –Hazards: Static –Dynamic –Essential – Hazards elimination.

10 Hours

Unit V

Memory Devices

Classification of memories –RAM organization – Write operation –Read operation – Memory cycle - Timing wave forms – Memory decoding – memory expansion – Static RAM Cell-Bipolar RAM cell – MOSFET RAM cell – Dynamic RAM cell –ROM organization - PROM –EPROM –EEPROM –EAPROM –Programmable Logic Devices –Programmable Logic Array (PLA)- Programmable Array Logic (PAL)-Field Programmable Gate Arrays (FPGA).

10 Hours
Total: 50 Hours

Textbook:

1. Morris Mano M, "Digital Design", 3.ed., Prentice Hall of India Pvt. Ltd., New Delhi, 2003/Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003 – (Unit I, II, V)
2. John .M Yarbrough, "Digital Logic Applications and Design", Thomson- Vikas publishing house, New Delhi, 2002. (Unit III, IV)

References:

1. Salivahanan S and Arivazhagan S, "Digital Circuits and Design", 2nd ed., Vikas Publishing House Pvt. Ltd, New Delhi, 2004.
2. James E. Palmer and David Perlman "Schaum's Outline of Introduction to Digital Systems", 2004

07G002 COMMUNICATION SKILLS – II
vide Civil Engineering 07G002

07G208 OBJECT ORIENTED PROGRAMMING LABORATORY
vide Civil Engineering 07G208

ENGINEERING GRAPHICS

(07I109, 07E109, 07L109 & 07N109) / (07C209, 07M209, 07T209, 07F209, 07Z209 & 07B209)

2 0 3 4

Unit I

Concepts and Conventions

Use of drafting instruments – BIS conventions and specifications – Size, layout and folding of drawing sheets – Lettering and dimensioning. Plane Curves: Conics – Construction of ellipse, parabola and hyperbola by eccentricity method – Construction of cycloid – construction of involutes of square, pentagon and circle. Projection of Points and Straight Lines: General principles of orthographic projection – First angle projection – Layout of views – Projection of points, located in all quadrant and straight lines located in the first quadrant – Determination of true lengths and true inclinations.

10 Hours

Unit II

Projection of Plane surfaces: Projection of polygonal surface and circular lamina inclined to one reference plane. Projection of Solids: Projection of simple solids like prisms, pyramids, cylinder and cone when the axis is inclined to one reference plane by change of position method. Sectioning of Solids: Sectioning of solids like prisms, pyramids, cylinder and cone in simple vertical position by cutting planes inclined to one reference plane – Obtaining the true shape of section.

10 Hours

Unit III

Development of surfaces

Development of lateral surfaces of simple and truncated solids – prisms, pyramids, cylinders and cones. Development of lateral surfaces of solids with square and cylindrical cutouts, perpendicular to the axis. Intersection of solids: Development of lateral surfaces of two Intersecting solids – cylinder & cylinder – prism & cylinder – Axis at right angles with no offset.

10 Hours

Unit IV

Isometric projections

Principles of isometric projection – isometric scale – isometric projections of simple solids, truncated prisms, pyramids, cylinders and cones. Perspective projections: Perspective projection of solids like prisms, pyramids by visual ray method and vanishing point method.

10 Hours

Unit V

Building Drawing

Sectional front view of the wall from foundation to super structure, plan, elevation and section of single storied / office building with flat RCC roof and brick masonry walls having not more than two rooms.

10 Hours

Total: 50 Hours

Textbooks:

1. Nataraajan K.V., "A text book of Engineering Graphics", Dhanalakshmi Publishers, Chennai, 2006.
2. Gopalakrishnan K., "Engineering Drawing" (Vol. I & II) Subhas Publications – 1998.

References:

1. Bhatt N.D., "Engineering Drawing" Charotar publishing House 46th Edition, 2003.
2. Venugopal K., "Engineering Graphics", New Age International (P) Limited, 2002.
3. Narayana K.L. and Kannaiah P., "Engineering Graphics", Scitech Publications (pvt) Limited-2002.
4. Shah M.B. and Rana B.C., "Engineering Drawing", Pearson Education, 2005
5. Dhawan R.K., "Text book of Engineering Drawings", S.Chand and company limited, 1997.

WORKSHOP PRACTICE

(07I110, 07E110, 07L110 & 07N110) / (07C210, 07M210, 07T210, 07F210, 07Z210 & 07B210)

0 0 3 2

Carpentry

- Handling of carpentry tools – Practice in marking, sawing, planning, and chiseling to size – Making simple joints such as half lap joint, T joint, dovetail joint, and mortise & tenon joint.
- Use of modern materials like Plywood, Chip board, Nova-pan, and laminated sheets.
- Study of joints in door panels, wooden furniture, etc

Fitting

- Use of fitting tools – Practices in marking, filing and fitting to size.
- Making of simple mating – Preparing the joints like square joint, V - joint,

Basic Machining

- Simple Turning and Taper turning
- Drilling practice

Plumbing

- Preparation of plumbing line sketches for water supply and sewage lines
- Basic pipe connection using valves, taps, couplings, unions, reducers, and elbows in household fitting.
- Practice in mixed pipe connections: Metal, plastic, and flexible pipes used in house hold appliances.
- Study of pipe connections on the suction

Demonstration

- Domestic Refrigerator, Air conditioner, Centrifugal pump, Blower, and Single stage air compressor

07G301 ENGINEERING MATHEMATICS III
vide Civil Engineering 07G301

07Z302 SYSTEM SOFTWARE

3 0 0 3

Unit I

Introduction

System software and machine architecture – The Simplified Instructional Computer (SIC) – Traditional CISC Machine - RISC Machine - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

10 Hours

Unit II

Assemblers

Basic assembler functions - A simple SIC assembler – Assembler algorithm and data structures – Machine dependent assembler features - Instruction formats and addressing modes – Program relocation – Machine independent assembler features - Literals – Symbol-defining statements – Expressions - One pass Multi pass Assembler. **10 Hours**

Unit III

Loaders and Linkers

Basic loader functions - Design of an Absolute Loader – A Simple Bootstrap Loader - Machine dependent loader features - Relocation – Program Linking – Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search – Loader Options - Loader design options- Linkage Editors – Dynamic Linking – Bootstrap Loaders - Implementation example - MSDOS linker.

10 Hours

Unit IV

Macro Processors

Basic macro processor functions - Macro Definition and Expansion – Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters – Generation of Unique Labels – Conditional Macro Expansion – Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor – ANSI C Macro language.

10 Hours

Unit V

Other System Software Tools

Database Management Systems-Basic Concepts of DBMS- Levels of data description- Use of a DBMS-Text editors - Overview of the Editing Process - User Interface – Editor Structure. - Interactive debugging systems - Debugging functions and capabilities – Relationship with other parts of the system – User- Interface Criteria.

10 Hours

Total: 50 Hours

Textbook:

Leland L. Beck, "System Software – An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2000.

References:

1. Dhamdhere D M, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 1972.

07Z303 ELECTRIC CIRCUITS AND MACHINES

3 1 0 4

Unit I

DC Circuits

Independent and dependent voltage and current sources – Source transformation- Star Delta Transformation- Mesh and nodal analysis - Nodal conductance matrix and mesh resistance matrix– Super position theorem – Thevenin's theorem – Norton's theorem – Maximum power transfer theorem.

10 Hours

Unit II

AC Circuits

Generation of AC voltages – Phase relation in pure resistor, inductor and capacitor – Power and power factor – Series and parallel circuits – Application of network theorems to AC circuits. Generation of Three phase voltages - Phase sequence – Three phase Star and delta connected sources and loads – Power measurement in three phase circuits using two Wattmeter method.

10 Hours

Unit III

DC Machines and Transformers

DC Machine – Construction-EMF equation – Types of generators and motor- Characteristics – losses and efficiency- Brake test – Swinbune's test - simple problems Transformer - Construction- EMF equation – Transformation ratio – types- losses and efficiency-regulation-Load test and OC & SC test of transformer.

10 Hours

Unit IV

Induction Machines

Construction – types - concept of rotating magnetic filed – torque equation – speed torque characteristics – starting methods-losses and efficiency- simple problems- single phase induction motors-Constructional details -principle of operation – starting.

10 Hours

Unit V:

Synchronous Motors and Special Machines

Construction- principle of operation - types of generator and motor- emf equation –voltage regulation - torque equation- reluctance motor-repulsion motor-stepper motor - servo motor.

10 Hours

Total: 50 Hours

Textbook:

Mehta V K, Rohit Mehta , "Principles of Electrical Engineering ", S.Chand 2007

References:

Sudhakar , Scham Mohan, " Circuit Network Analysis & Synthesis" Tata McGraw Hill

07Z304 DATA STRUCTURES

3 1 0 4

Unit I

Introduction

Pseudo code–Abstract Data types-Model for an ADT-ADT Implementations-Algorithm Efficiency-Designing Recursive Algorithms-Recursive Examples.

10 Hours

Unit II

Linear List: Stacks, Queues and Lists

Arrays – Basic Stack Operation-Stack ADT - Applications of Stack – Queues Operations- Queue ADT – Queue Applications-List ADT- Circular-Doubly Linked List.

10 Hours

Unit III

Sorting and Searching

Sorting: Insertion Sort-Selection Sort-Bubble Sort - Merge sort – Quick sort –External Sorts. Searching: Sequential search- Binary Search. -Hashing Methods**.**

10 Hours

Unit IV

Non Linear List: Trees

Basic Tree concepts - Binary Trees– Tree Traversals –Expression Trees-Binary Search Trees – AVL Search Trees-Heap concepts-Implementation-Heap ADT-Heap Applications: Priority Queue.

10 Hours

Unit V

Graphs

Definitions – Traverse Graph: Depth first Traversal-Breadth first Traversal-Shortest Path Algorithms: Unweighted Shortest Paths – Dijkstra's Algorithm. Minimum Spanning Tree: Prim's Algorithm– Kruskals Algorithm-Introduction to NP-Completeness.

10 Hours

Total: 50 Hours

Textbook:

Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", Thomson, 2nd Edition Reprint 2007(I,II,III,IV Units)

References:

1. Weiss M A, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.(V Unit)
2. Langsam Y, Augenstein M J and Tenenbaum A M, "Data Structures using C", Pearson Education Asia, 2004

3. Aho, J. Hopcroft E and Ullman J D, “Data Structures and Algorithms”, Pearson education, Asia, 1983.

07Z305 INSTRUMENTATION AND CONTROL ENGINEERING 3 1 0 4

Unit I

Basics of Measurement

Definitions of Instrument, Instrumentation, Control, Controllers. Functional elements of a measurement system. Standards – Calibration methods – Static calibration – Classification of errors – Error analysis – Statistical methods, Static characteristics – Accuracy, Precision, Bias, Sensitivity, Linearity, Resolution, Threshold, and Hysteresis – Transfer function – Dynamic characteristics of zero and first order systems.

10 Hours

Unit II

Transducers

Principle of operation – Construction details – Characteristics and applications of resistance Potentiometers – Strain gauges, Resistance thermometers, Thermistors, Thermocouple, LVDT, Capacitive transducers, Piezo electric transducers, principle of operation and applications for force measurement.

10 Hours

Unit III

Instrumentation

Indicating and recording devices – Analog and Digital Voltmeters and Ammeters – Cathode Ray Oscilloscopes – Construction and working – Block diagram, Schematic diagram and applications, x-y plotters – Digital printers and plotters – Function generators – Magnetic disc and tape storage – Data loggers.

10 Hours

Unit IV

Systems Representation

Basic elements in control systems – Open and close loop systems – Transfer function – Electrical – Mechanical , Thermal and Hydraulic systems and determination of their transfer function – Block diagram reduction techniques – Signal flow graph – Transfer function of overall system.

10 Hours

Unit V

Time and Frequency Response

Time response – Time domain specifications – Standard test inputs – First and second order system response to standard test signals – Error coefficients – Generalized error series – Steady state error – Types of controller – Frequency response – Bode plots – Magnitude and phase plot.

10 Hours

Total: 50 Hours

Textbooks:

1. Sawhney, A.K., A Course in “Electrical and Electronics Measurements and Instrumentation”, Dhanpat Rai & Co. (P) Ltd., 2007.
2. I.J.Nagrath and M.Gopal, “Control Systems”, New Age International Publishers, New Delhi, 2007.

References:

1. Doebelin, E.O., “Measurement Systems”, Tata McGraw-Hill Book Co., 2005.
2. S.K.Singh,”Industrial Instrumentation and Control”, Tata McGraw-Hill Book Co., 2007
3. Patranabis, D, “Sensors and Transducers”, Wheeler Publishing Co., Ltd. New Delhi, 2005.
4. Murthy, D.V.S., “Transducers and Instrumentation”, Prentice Hall of India Pvt. Ltd., New Delhi, 2005.
5. Ogata K., “Modern Control Engineering”, Prentice Hall of India Ltd., New Delhi, 2007.

6. Bandhyopadhyay M., "Control Engineering – Theory and Practice", Prentice Hall of India Ltd., New Delhi, 2007.

07Z306 SOFTWARE ENGINEERING

3 0 0 3

Unit I

The Process

Software Engineering –A Layered Technology-Software Process-Software Process Models Waterfall Life Cycle Model, RAD Model, Prototype Model-Evolutionary Software Process Models-Component Based Development- 4th Generation Techniques.

10 Hours

Unit II

Managing Software Projects

Metrics In The Process And Project Domains-Software Measurements-Metrics For Software Quality-Software Project Planning: Project Planning Objective- Software Scope- Resources- Software Project Estimation-Decomposition Techniques- Empirical Estimation Models- The Make/Buy Decision-Automated Estimation Tools.

10 Hours

Unit III

Risk Analysis and Management

Reactive Versus Proactive Risk Strategies- Software Risks- Risk Identification-Risk Projection-Risk Refinement-RMMM-Safety Risks and Hazards-The RMMM Plan- Design Concepts and Principles- The Design Process-Cohesion-Coupling-Design Documentation. **10 Hours**

Unit IV

Software Testing Techniques

Software Testing Fundamentals – Test Case Design- White-Box Testing –Basic Path Testing- Control Structure Testing- Black Box Testing- Software Testing Strategies – A Strategic Approach to Software Testing- Unit Testing-Integration Testing- Validation Testing - System Testing- The Art of Debugging.

10 Hours

Unit V

Software Quality Assurance

Quality Concepts- Software Quality Assurance- Software Reviews-Formal Technical Reviews-Software Reliability-Software Configuration Management-The SCM Process-Version Control-Change Control-Configuration Audit.

10 Hours

Total: 50 Hours

Textbook:

Roger S. Pressman, 'Software Engineering: A Practitioner Approach", 5th edition, McGraw-Hill, 1999.

References:

1. Fairley, "Software Engineering Concepts", McGraw-Hill, 1985.
2. Sommerville I., "Software Engineering", 5th edition, Addison Wesley, 1996.
3. David Gustafson, "Software Engineering", Schaum's outlines, Tata McGraw-Hill, 2003.

07G004 PROFESSIONAL ETHICS
vide Civil Engineering 07G004

07Z308 SYSTEM SOFTWARE LABORATORY

0 0 3 2

List of Experiments:

1. Implement a symbol table with functions to create, insert, modify, search, and display.
2. Implement pass one of a two pass assembler.

3. Implement pass two of a two pass assembler.
4. Implement a single pass assembler.
5. Implement a macro processor.
6. Implement an absolute loader.
7. Implement a relocating loader.
8. Implement pass one of a direct-linking loader.
9. Implement pass two of a direct-linking loader.
10. Implement a simple text editor with features like insertion / deletion of a character, word.

07Z309 DATA STRUCTURES LABORATORY

0 0 3 2

List of Exercises:

1. Array Implementation of Stack and Queues
2. Link List Implementation of Stack and Queues
3. Implementation of Single linked list
4. Implementation of Doubly linked list
5. Implementation of Selection Sort and Bubble Sort
6. Implementation of Quick sort
7. Implementation of Heap sort
8. Implementation of Liner and Binary Search trees
9. Implementation of binary Tree traversal
10. Implementation of Infix to Postfix, Prefix to Postfix conversion
11. Implementation of Breadth First Search Techniques
12. Implementation of Depth first Search Techniques.

07Z310 ELECTRICAL ENGINEERING AND CONTROL SYSTEMS LABORATORY

0 0 3 2

List of Experiments:

1. Verification of Kirchoff's laws
2. Study of RL, RLC series and parallel circuits
3. Open circuit and load characteristics of self-excited DC generator
4. Load test on D.C. shunt motor
5. Swinburne's test on D.C. machine
6. Speed control of D.C. shunt motor
7. Load test on single phase transformer
8. Load test on single-phase induction motor
9. Load test on three phase induction motor

10. Transfer function of armature controlled D.C. motor
11. Transfer function of field controlled D.C. motor
12. Transfer function of A.C. servo motor

07Z401 PROBABILITY AND QUEUING THEORY

4 2 0 4

Unit I

Probability and Random Variable

Axioms of probability - Conditional probability - Total probability – Baye's theorem- Random variable - Probability mass function - Probability density function - Properties - Moments - Moment generating functions and their properties.

10 Hours

Unit II

Standard Distributions

Binomial, Poisson, Geometric, Negative Binomial, Uniform, Exponential, Gamma, Weibull and Normal distributions and their properties - Functions of a random variable. **10 Hours**

Unit III

Two Dimensional Random Variables

Joint distributions - Marginal and conditional distributions – Covariance - Correlation and regression - Transformation of random variables - Central limit theorem. **10 Hours**

Unit IV

Random Processes and Markov Chains

Classification - Stationary process - Markov process - Poisson process - Birth and death process - Markov chains - Transition probabilities - Limiting distributions. **10 Hours**

Unit V

Queuing Theory

Markovian models – M/M/1, M/M/C , finite and infinite capacity - M/M/∞ queues - Finite source model - M/G/1 queue (steady state solutions only) – Pollaczek – Khintchine formula – Special cases. **10 Hours**

Total: 50 Hours

Textbook:

M.B.K.Moorthy, "Probability, Random Processes and Queuing Theory", SciTech Publications, Chennai, 2007.

References:

1. Veerarajan., T., "Probability, Statistics and Random Processes", Tata McGraw-Hill, Second Edition, New Delhi, 2003.
2. Medhi. J. "Stochastic Processes", New Age Publishers, New Delhi, 1994.
3. Allen., A.O., "Probability, Statistics and Queuing Theory", Academic press, New Delhi, 1981.
4. Gross, D. and Harris, C.M., "Fundamentals of Queuing theory", John Wiley and Sons, Second Edition, New York, 1985.

07Z402 COMPUTER ARCHITECTURE

3 1 0 3

Unit I

Computer Structures

Functional units - Basic operational concepts - Bus structures - Software - performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues. **10 Hours**

Unit II
Input/Output Unit
Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB)- Computer Peripherals – Input Devices – Output Devices. **10 Hours**

Unit III
Memory Unit
Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage. **10 Hours**

Unit IV
Arithmetic Operations
Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.
10 Hours

Unit V
Basic Processing Unit
Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Micro programmed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation. **10 Hours**

Total: 50 Hours

Textbook:

Carl Hamacher, Zvonko Vranesic and Safwat Zaky, "Computer Organization", McGraw-Hill, 5th Edition, 2002.

References:

1. William Stallings, "Computer Organization and Architecture – Designing for Performance", Pearson Education, 6th Edition, 2003.
2. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", Morgan Kaufmann, 2nd Edition, 2002.
3. John P.Hayes, "Computer Architecture and Organization", McGraw Hill, 3rd Edition, 1998.

07Z403 JAVA PROGRAMMING

3 1 0 3

Unit I
Introduction to Java
The Genesis of Java – Overview of Java – Data types, Variables, Arrays-Operators-Control statements.
10 Hours

Unit II
Introducing Classes
Class Fundamentals-Declaring objects-Methods-Constructors-This keyword-Overloading methods-Inheritance-Packages-Interfaces-Exception Handling. **10 Hours**

Unit III
Exploring I/O and Lang Packages
String Handling: String Constructors, special String operations, character extraction, string comparison, Modifying String, String buffer- String to kenizer -Exploring java.lang: Simple type wrappers, object, math-Exploring java.io:

File, Input Stream, Output Stream, File Input Stream, File Output Stream, Object Input Stream, Object Output Stream. **10 Hours**

Unit IV

Exploring Utility Package

Overview of Collections-Collection Interfaces-Collection classes-Legacy classes and Interfaces-Date-Calendar-Time Zone-Random-Timer-java. util. zip, jar-Multithreaded environment.

10 Hours

Unit V

Exploring Applet, AWT

The Applet class: applet initialization and termination-Applet skeleton- Simple Applet display method- Event handling: Event handling mechanisms-Event classes- Sources of Events-Event Listener interfaces-Introducing AWT: working with Windows, Controls, Layout managers, menus-Introduction to JDBC.

10 Hours

Total: 50 Hours

Textbook:

Herbert Scheldt, "The Complete Reference JAVA 2" Fifth Edition Tata McGrawHill, 2003.

Reference:

Ken Arnold, James Gosling "The Java Language", I Edition, Addison Wesley, 1998.

07Z404 OPERATING SYSTEMS

3 0 0 3

Unit I

Introduction & Operating System Structures

Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs – System Structure – Virtual Machines – System Design and Implementation. **10 Hours**

Unit II

Process Management

Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication- Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling. **10 Hours**

Unit III

Process Synchronization & Deadlocks

The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors. System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks.

10 Hours

Unit IV

Storage Management & File System Interface

Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging - Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – Protection.

10 Hours

Unit V

File System Implementation & Mass Storage Structure

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows. **10 Hours**

Total: 50 Hours

Textbook:

Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

References:

1. Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India Pvt. Ltd, 2003.
3. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.

07Z405 DATABASE MANAGEMENT SYSTEMS

4 1 0 4

Unit I

Introduction and Conceptual Modeling

Introduction to File and Database systems- View of Data- Data Models – ER model- Introduction to Network and Hierarchical Models – Relational Model – Structure of Relational databases- Relational Algebra-Relational Calculus. **10 Hours**

Unit II

Relational Model and Database design

SQL – Data definition- Basic structure of SQL Queries-Queries in SQL- Set operations-Aggregate functions- Null values-Nested sub queries- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF). **10 Hours**

Unit III

Data Storage and Query Processing

Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing. **10 Hours**

Unit IV

Transaction Management

Transaction concept– Transaction state- Implementation of Atomicity and Durability- Concurrent executions- Serializability- Recoverability and Testing for Serializability- Concurrency Control- Lock based protocols- Timestamp-based protocols- Deadlock handling- Recovery system-Stable storage implementation-Recovery and Atomicity- Log based recovery. **10 Hours**

Unit V

Recent Trends

Object -Based Databases – Need for Complex Data types- Structured types and Inheritance in SQL- Table inheritance- Object identity and Reference types in SQL- Distributed databases- Homogenous and Heterogeneous DDB- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Overview of Data Mining and Data Warehousing.

10 Hours

Total: 50 Hours

Textbook:

Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fifth Edition, McGraw-Hill, 2002.

References:

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
3. Date C.J., "An Introduction to Database system", Pearson Education, 7th Edition, 2003
4. Peter Rob and Corlos Coronel- "Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

07Z406 DESIGN AND ANALYSIS OF ALGORITHMS

3 0 0 3

Unit I

Basic concepts of Algorithms

Introduction – Notion of Algorithm – Fundamentals of Algorithmic Solving – Important Problem types – Fundamental Data structures- Fundamentals of the Analysis of algorithm efficiency – Asymptotic Notations and Basic Efficiency Classes. **10 Hours**

Unit II

Mathematical Aspects and Analysis of Algorithms

Mathematical Analysis of Non-recursive Algorithm – Mathematical Analysis of Recursive Algorithm – Example: Fibonacci Numbers – Empirical Analysis of Algorithms – Algorithm Visualization. **10 Hours**

Unit III

Analysis of Sorting and Searching Algorithms

Brute Force – Selection Sort and Bubble Sort – Sequential Search and Brute-force string matching – Divide and conquer – Merge sort – Quick Sort – Binary Search – Binary tree- Traversal and Related Properties – Decrease and Conquer – Insertion Sort – Depth first Search and Breadth First Search. **10 Hours**

Unit IV

Algorithmic Techniques

Transform and conquer – Presorting – Balanced Search trees – AVL Trees – Heaps and Heap sort – Dynamic Programming – Warshall's and Floyd's Algorithm – Optimal Binary Search trees – Greedy Techniques – Prim's Algorithm – Kruskal's Algorithm – Dijkstra's Algorithm – Huffman trees. **10 Hours**

Unit V

Algorithm Design Methods

Backtracking – n-Queen's Problem – Hamiltonian Circuit problem – Subset-Sum problem – Branch and bound – Assignment problem – Knapsack problem – Traveling salesman problem. **10 Hours**

Total: 50 Hours

Textbook:

Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

References:

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003.
3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis of Computer Algorithms", Pearson Education Asia, 2003.

07G003 Professional Communication

vide Civil Engineering 07G003

07Z408 OPERATING SYSTEM LABORATORY

(Implement the following on LINUX platform. Use C for high level language implementation)

0 0 3 2

List of Experiments

1. UNIX - Basic Commands.
2. Shell programming (Using looping, control constructs etc.,)
3. Write programs using the following system calls of UNIX operating system: fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Implementation of CPU scheduling algorithms: FCFS, SJF, Round Robin & Priority Scheduling.
7. Implement the Producer – Consumer problem using semaphores.
8. Implementation of Banker's algorithm.
9. Implement some memory management schemes (First fit, Best fit & Worst fit)
10. Implement some page replacement algorithms (FIFO & LRU)

07Z409 DATABASE MANAGEMENT SYSTEMS LABORATORY

0 0 3 2

List of Experiments

1. Working with DDL, DML, TCL, DCL of SQL commands.
2. Working with Single-row functions and group functions in SQL.
3. Working with Joins and Integrity constraints.
4. Working with other database objects: Synonyms, Sequences, Views and Indexes.
5. Working with Locks and Partitions.
6. Working with PL/SQL blocks.
7. Working with Exception handling in PL/SQL.
8. High level language extension with cursors.
9. High level language extension with triggers.
10. Procedures, Function, Packages.
11. Embedded SQL.

Mini Project

Design and implementation of an application like payroll processing, banking system, library information system etc using PL/SQL.

07Z410 JAVA PROGRAMMING LABORATORY

0 0 3 2

List of Experiments:

1. Programs to work with Java Classes and Objects
2. Programs to implement Constructor overloading and overriding concepts
3. Programs to implement inheritance
4. Programs using interfaces
5. Programs to handle Exceptions
6. Programs for Strings handling
7. Programs to work with Files (I/O package)
8. Programs to implement Multithreading concepts
9. Simple Java applet and application
10. Implementing JDBC concepts

07Z501 DISCRETE MATHEMATICS

3 2 0 4

Unit I

Propositional Calculus

Propositions- Logical connectives – Compound propositions- Conditional and biconditional propositions- Truth tables – Tautologies and Contradictions – Contrapositive- Logical and equivalences and implications- DeMorgan's Laws- Normal forms- Principal conjunctive and disjunctive normal forms- Rules of inference – Arguments- Validity of arguments

10 Hours

Unit II

Predicate Calculus

Predicates – Statement function – Variables- Free and bound variables- Quantifiers- Universe of discourse – Logical equivalences and implications for quantified statements- Theory of inference- The rules of universal specification and generalization – Validity of arguments.

10 hours

Unit III

Set Theory

Basic concepts- Notations- Subset – Algebra of sets- The power set – Ordered pairs and Cartesian product- Relations on sets- Types of relations and their properties- Relational matrix and the graph of a relation – Partitions – Equivalence relations – Partial ordering – Poset- Hasse diagram –Lattices and their properties- Sublattices- Boolean algebra- Homomorphism **10 Hours**

Unit IV

Functions

Definitions of functions – Classification of functions - Type of functions – Examples- Composition of functions- Inverse functions- Binary and n-ary operations- Characteristic function of a set- Hashing functions – Recursive functions –Permutation functions. **10 Hours**

Unit V

Groups

Algebraic systems- Definitions- Examples- Properties- Semigroups- Monoids- Homomorphism- Sub semigroups and submonoids- Cosets and Lagrange's theorem – Normal subgroups – Normal algebraic system with two binary operations- Codes and Group codes – Basic notions of error correction- Error recovery in group codes.

10 Hours

Total: 50 Hours

Textbook:

Geetha P , " Discrete Mathematics" , Scitech Publications., Chennai.

References:

1. Trembly J P and Manohar R, " Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill Publications Co. Ltd., New Delhi 2003.
2. Ralph P Girmaldi, " Discrete and Combinatorial Mathematics : An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2002.
3. Kenneth H.Rosen , " Discrete Mathematical and its Applications " , Fifth edition, , Tata McGraw-Hill Pub. Co.Ltd, New Delhi, 2003.

07Z502 COMPUTER GRAPHICS

3 0 0 3

Unit I

Introduction & Overview of Graphics Systems

Introduction - Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image processing – Graphical User Interface – Video Display Devices – Raster Scan Systems – Random Scan Systems – Graphics monitors and workstations – Input Devices – Hard Copy Devices – Graphics Software. **10 Hours**

Unit II

Output Primitives & Attributes of Output Primitives

Points and Lines – Line Drawing Algorithms – Loading the frame buffer – Line function – Circle generating algorithms – Ellipse generating algorithms – Filled area primitives – Line attributes – Curve Attributes – Color and Grayscale Levels – Area-Fill attributes – Character Attributes – Inquiry Functions – Antialiasing.

10 Hours

Unit III

Two Dimensional Geometric Transformations

Basic transformations – Matrix representations – Composite Transformations – other transformations - Affine Transformations – Transformation Functions – Raster Methods for Transformations – Viewing Pipeline – Window–to-Viewport coordinate Transformation – Two Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

10 Hours

Unit IV

Graphical User Interfaces & Interactive Input Methods

The user Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques – Virtual Reality Environments – Three Dimensional Object Representation: polygon surfaces-curved line and surfaces-Quadric surface-super Quadrics - Blobby objects - Bezier curves and surfaces - constructive solid geometry methods – Octrees - BSP trees. **10 Hours**

Unit V

Three Dimensional Concepts & Applications

Three dimensional geometric and modeling transformations - Visible-surface Detection methods-polygon rendering methods-color models and color applications-computer animation. **10 Hours**

Total: 50 Hours

Textbook:

Donald Hearn and Pauline Baker, "Computer Graphics C version", Pearson Education, 2003.

Reference:

Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education 2003.

07Z503 UNIX INTERNALS

3 0 0 3

Unit I

UNIX Operating System – History – Commands – System Structure – Shell, Shell Programming – System / Calls – Unix Communications - Architecture – Kernal Data structures – File sub-system and Process – sub-system – User-Kernal modes – Process States and Transitions – Sleep and Wakeup. **10 Hours**

Unit II
Buffers – Structure and representator – Implementation of Systems Calls. **10 Hours**

Unit III
Structure – Context – Address Space – Creation – Termination – Scheduling – Threads implementation of System Calls. **10 Hours**

Unit IV
Swapping – Segmentation – Demand Paging – Implementation of System calls. **10 Hours**

Unit V
Drivers – Streams – Implementation of IPC mechanisms. **10 Hours**

Total: 50 Hours

Textbook:

Bach M.J. "The Design of the Unix Operating System", Prentice Hall Of India, 1986.

Reference:

1. Goodheart B. Cox J, "The Magic Garden Explained", Prentice Hall of India, 1994.
2. Leffler S.J., Mckusick M.K., Karels M.J. and Quarterman J.S., "The Design and Implementation of the 4.3 BSD Unix Operating System", Addison Wesley, 1998.

07Z504 THEORY OF COMPUTATION

3 1 0 4

Unit I
Regular Expressions and Automata
Introduction to formal proof – Additional forms of proof – Inductive proofs –Finite Automata (FA) – Deterministic Finite Automata (DFA)– Non-deterministic Finite Automata (NFA) – Finite Automata with Epsilon transitions. Regular Expression – FA and Regular Expressions – Proving languages not to be regular – Closure properties of regular languages – Equivalence and minimization of Automata.

10 Hours

Unit II
Context-Free Grammar and Languages
Context-Free Grammar (CFG) – Parse Trees – Ambiguity in grammars and languages – Derivations and Languages-Relationship between derivation and derivation trees -Simplification of CFG-Greiback Normal Form-Chomsky Normal Forms-Problems related to CNF and GNF.

10 Hours

Unit III
Pushdown Automata
Definition of the Pushdown automata –Instantaneous Descriptors- Languages of a Pushdown Automata – Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata-Applications of Pumping Lemma- Pumping Lemma for CFL. **10 Hours**

Unit IV
Turing Machines
Turing Machines – Computable Languages and Functions-Turing Machine Constructions-Storage in finite control-Multiple Tracks-Checking of symbols-Subroutines-Two way infinite tape.

10 Hours

Unit V
Undecidability
Properties of Recursive and Recursively Enumerable Languages –Turing Machine as an Undecidable problem – Post's Correspondence Problem – Rice's Theorem. **10 Hours**

Total: 50 Hours

Textbook:

J.E.Hopcroft, and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Narosa Publishers, 2002.

References:

1. J.E.Hopcroft, R.Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2003.
2. H.R.Lewis and C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education/PHI, 2003.
3. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, TMH, 2003.
4. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

07Z505 OBJECT ORIENTED ANALYSIS AND DESIGN

3 1 0 4

Unit I

Introduction

An Overview of Object Oriented Systems Development - Object Basics – Object Oriented Systems Development Life Cycle. **10 Hours**

Unit II

Object Oriented Methodologies

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns – Frameworks – Unified Approach – Unified Modeling Language – Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram **10 Hours**

Unit III

Object Oriented Analysis

Identifying use cases - Object Analysis - Classification – Identifying Object relationships - Attributes and Methods. **10 Hours**

Unit IV

Object Oriented Design

Design axioms - Designing Classes – Access Layer - Object Storage - Object Interoperability. **10 Hours**

Unit V

Software Quality and Usability

Designing Interface Objects – Software Quality Assurance – System Usability - Measuring User Satisfaction. **10 Hours**

Total : 50 Hours

Textbook:

Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, 1999 (Unit I, III, IV, V).

References:

1. Martin Fowler, "UML Distilled", Second Edition, PHI/Pearson Education, 2002. (UNIT II)
2. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2003.
3. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.
4. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

07Z506 MICROPROCESSORS

3 0 0 3

Unit I

The 8085 Microprocessor

Introduction to 8085 – Microprocessor architecture – Instruction set – Programming the 8085 – Code conversion.

10 Hours

Unit II

8086 Software Aspects

Intel 8086 microprocessor – Architecture – Instruction set and assembler directives – Addressing modes – Assembly language programming – Procedures – Macros – Interrupts and interrupt service routines.

10 Hours

Unit III

8086 System Design

8086 signals and timing – MIN/MAX mode of operation – Addressing memory and I/O – Multiprocessor configurations – System design using 8086 **10 Hours**

Unit IV

I/O Interfacing

Memory Interfacing and I/O interfacing - Parallel communication interface – Serial communication interface – Timer – Keyboard /display controller – Interrupt controller – DMA controller – Programming and applications.

10 Hours

Unit V

Microcontrollers

Architecture of 8051 – Signals – Operational features – Memory and I/O addressing – Interrupts – Instruction set – Applications. **10 Hours**

Total : 50 Hours

Textbook:

A.K. Ray & K.M.Bhurchandi, "Advanced Microprocessors and peripherals- Architectures, Programming and Interfacing", TMH, 2002 reprint. (UNITS 2 to 5: – Chapters 1-6, 7.1-7.3, 8, 16)

References:

1. Ramesh S.Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Penram International publishing private limited, fifth edition. (UNIT-1: – Chapters 3,5,6 and programming examples from chapters 7-10)
2. Douglas V.Hall, "Microprocessors and Interfacing: Programming and Hardware", TMH, Third edition
3. Yu-cheng Liu, Glenn A.Gibson, "Microcomputer systems: The 8086 / 8088 Family architecture, Programming and Design", PHI 2003
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, "The 8051 microcontroller and embedded systems", Pearson education, 2004.

07G005 ENGINEERING ECONOMICS
vide civil engineering 07G005

07Z508 COMPUTER GRAPHICS LABORATORY

0 0 3 2

1. Implementation of Line Drawing Algorithms
   a) DDA b) Bresenham
2. Implementation of Bresenham's Circle Generation Algorithm
3. Implementation of Bresenham's Ellipse Generation Algorithm

4. Implementation of Two Dimensional Transformations
5. Implementation of Cohen-Sutherland Line Clipping Algorithm
6. Implementation of Sutherland-Hodgement Polygon Clipping Algorithm
7. Implementation of 2D Window – to – Viewport Conversion
8. Implementation of 3D Transformations
9. Animation Using C Graphics

07Z509 OBJECT ORIENTED ANALYSIS AND DESIGN LABORATORY

0 0 3 2

1. Prepare the following documents for two or three of the experiments listed below and develop the software engineering methodology.
2. Program Analysis and Project Planning.
   Thorough study of the problem – Identify project scope, Objectives, Infrastructure.
3. Software requirement Analysis
   Describe the individual Phases / Modules of the project, Identify deliverables.
4. Data Modeling
   Use work products – Data dictionary, Use diagrams and activity diagrams, build and test Class diagrams, Sequence diagrams and add interface to class diagrams.
5. Software Development and Debugging
6. Software Testing Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor.

SUGGESTED LIST OF APPLICATIONS

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Payroll System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

07Z510 MICROPROCESSORS LAB

0 0 3 2

1. Programming with 8085 – 8-bit / 16-bit multiplication/division using repeated addition/subtraction
2. Programming with 8085-code conversion, decimal arithmetic, bit manipulations.
3. Programming with 8085-matrix multiplication, floating point operations
4. Programming with 8086 – String manipulation, search, find and replace, copy operations, sorting. (PC Required)
5. Using BIOS/DOS calls: Keyboard control, display, file manipulation. (PC Required)
6. Using BIOS/DOS calls: Disk operations. (PC Required)
7. Interfacing with 8085/8086 – 8255, 8253
8. Interfacing with 8085/8086 – 8279,8251
9. 8051 Microcontroller based experiments – Simple assembly language programs (cross assembler required).
10. 8051 Microcontroller based experiments – Simple control applications (cross assembler required).

07Z601 ARTIFICIAL INTELLIGENCE

3 0 0 3

Unit I

Introduction

Introduction to Artificial Intelligence -Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information **10 Hours**

Unit II

Searching Techniques

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance. **10 Hours**

Unit III

Knowledge Representation

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects **10 Hours**

Unit IV

Planning

Planning problem- Planning with State-space search-Partial order planning-Planning graphs-Planning with propositional logic-Planning and acting in the real world-Time, Schedules and Resources-Hierarchical Task Network Planning-Conditional planning-Replanning-Continuous planning-Multi-Agent planning.

10 Hours

Unit V

Learning

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

10 Hours

Total: 50 Hours

Textbook:

Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.

References:

1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.

07Z602 COMPILER DESIGN

3 1 0 4

Unit I

Introduction to Compiling

Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis **–** Role of Lexical Analyzer – Input Buffering – Specification of Tokens -Finite automata - Regular expression to finite automation- LEX -Implementation of lexical analyzer using LEX -. **10 Hours**

Unit II

Syntax Analysis

-Role of the parser –Writing Grammars –Context-Free Grammars – YACC - Implementation of parser using YACC- Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers **–** SLR Parser – Canonical LR Parser – LALR Parser.

10 Hours

Unit III

Intermediate Code Generation

Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls. **10 Hours**

Unit IV

Code Generation

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization. **10 Hours**

Unit V

Code Optimization And Run Time Environments

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – **Loops in flow graphs-** Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

10 Hours

Total: 50 Hours

Textbook:

Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education Asia, 2003.

References:

1. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
2. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
3. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.
4. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", PHI, 2001.
5. Kenneth C. Louden, "Compiler Construction: Principles and Practice", Thompson Learning, 2003

07Z603 SOFTWARE TESTING

3 0 0 3

Unit I

Introduction

Software Testing-Role Of Software Testing-A Structural Approach To Testing-Test Strategy-Methods For Developing Test Strategy-Test Methodologies. **10 Hours**

Unit II

Life Cycle Testing Approach

Test Plan-Requirements Testing-Walkthrough Test Tool-Risk Matrix Test Tool-Testing For Requirements Phase and Design Phase-Design Review Test Tool-Test Data and Volume Test Tools. **10 Hours**

Unit III

Installation

Installation Phase Testing-Tools for Acceptance Test-Software Acceptance Process-Software Maintenance-Methodologies for Testing-Training and Change Installation. **10 Hours**

Unit IV

Testing Methods

Tools and Techniques-Cost Estimate for Testing-Testing Phase of Life Cycle-Point Accumulation Tracking System-Performance Analysis of Testing-Inspection Plan and Test Plan Documents. **10 Hours**

Unit V

Testing Strategy

Rapid Prototyping-Spiral Testing-Tool Selection Processes-Structural System Testing-Documentation of Test Results-Test Effectiveness Evaluation-Test Measurement Process-Test Metrics. **10 Hours**

Total: 50 Hours

Textbook:

William E Perry, "Effective Methods for Software Testing", John Wiley& Sons, Second Edition, USA, 2000.

References:

1. Ali Behforooz, Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, Newyork, 2003.
2. Roger S Pressman, "Software Engineering-A Practitioner's Approach", Mcgroaw Hill International Edition, Fifth Edition, Singapore, 2001.

07Z604 FREE OPEN SOURCE SOFTWARE

3 0 0 3

Unit I

Overview of Free/Open Source Software-- Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential—global and Indian. GNU/Linux OS installation-- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log

files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

10 Hours

Unit II

Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities -- configure X windows, detect display devices ; Installing software -- from source code as well as using binary packages. Setting up email servers-- using postfix (SMTP services), courier (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers -- using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squ id (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database).

10 Hours

Unit III

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection –GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

10 Hours

Unit IV

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practicies and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting. Basics of the X Windows server architecture.

10 Hours

Unit V

Qt Programming; Gtk+ Programming; Python Programming; Programming GUI applications with localisation support.

10 Hours

Total: 50 Hours

Textbook:

N. B. Venkateshwarlu (Ed); "Introduction to Linux: Installation and Programming" B S Publishers; 2005. (An NRCFOSS Publication)

References:

1. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, "Running Linux", Fourth Edition, O'Reilly Publishers, December 2002, ISBN: 0-596-00272-6.
2. Carla Schroder, "Linux Cookbook", First Edition, O'Reilly Cookbooks Series, November 2004, ISBN: 0-596-00650-3.

On-line materials

1. Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN: 1-56592-582-3. URL: http://www.oreilly.com/catalog/opensources/book/toc.html
2. The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html
3. The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: http://www.tldp.org/guides.html
4. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html

5. An Introduction to GCC, Brian Gough. URL: http://www.network-theory.co.uk/docs/gccintro/
6. GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: http://sources.redhat.com/autobook/
7. Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL: http://cvsbook.red-bean.com/
8. Advanced Bash Scripting Guide, Mendel Cooper, June 2005. URL: http://www.tldp.org/guides.html
9. GTK+/GNOME Application Development, Havoc Pennington. URL: http://developer.gnome.org/doc/GGAD/
10. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: http://www.python.org/doc/current/tut/tut.html

07Z605 COMPUTER COMMUNICATION NETWORKS

3 0 0 3

Unit I

Data Communications

Introduction to Networks -Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

10 Hours

Unit II

Data Link Layer

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Multiple access protocols: Pure ALOHA, Slotted ALOHA, CSMA, CSMA/CD, FDMA, TDMA, CDMA- Bridges.

10 Hours

Unit III

Network Layer

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Addressing-Internet address, classful address, subnetting; Routing-Techniques, static vs. Dynamic routing , routing table for classful address; Routing algorithms-shortest path algorithm, flooding, Distance Vector Routing – Link State Routing – Routers -Protocols: ARP, RARP, IP, ICMP, IPV6; Unicast and multicast routing protocols.

10 Hours

Unit IV

Transport Layer

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services. **10 Hours**

Unit V

Application Layer

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography-firewall- Introduction to blue-tooth- VLAN's-Cellular telephony & Satellite network. **10 Hours**

. **Total: 50 Hours**

Textbook:

Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 4th edition.

Reference:

Andrew S. Tanenbaum "Computer Networks " Tata McGraw-Hill ,4th Edition.

07G006 TOTAL QUALITY MANAGEMENT

vide Civil Engineering 07G006

07Z608 COMPUTER COMMUNICATION NETWORKS LABORATORY

0 0 3 2

1. Client Server communication using basic socket communication
2. File Transfer between nodes in a network
3. Routing Algorithm behavior in terms of complexity
4. Simulation of ARP / RARP.
5. Write a program that takes a binary file as input and performs bit stuffing and CRC Computation.
6. Develop an application for transferring files over RS232.
7. Simulation of Sliding-Window protocol.
8. Simulation of BGP / OSPF routing protocol.
9. Develop a Client – Server application for chat.
10. Develop a Client that contacts a given DNS Server to resolve a given host name.
11. Write a Client to download a file from a HTTP Server.
12. Introduction to ns2 (network simulator) - small simulation exercises to study TCP Behavior under different scenarios

07Z609 COMPILER DESIGN LABORATORY

0 0 3 2

List of Experiments:

1.Implement of lexical analyzer using C.

2.Write a program for constructing Token Categorization using C

3. Simple Lex Programs

a).Separation of Identifier and Number Using Lex

b).Summation of the given numbers

c).Conversion of Decimal to Hexadecimal Number using Lex

4. Lexical Analyzer using Lex

5. Implement of lexical analyzer using Lex

6. Simple Yacc Programs

a).Complex Calculator operations

7. Linking Lex and YACC programs

8. Write a program to find First and Follow of the given Grammar using C.

9. Write a program for constructing Top Down –Predictive Parsing table.

10. Write a program to implement Shift reduces parsing Algorithm.

11. Write a program to implement Operator precedence Parsing Algorithm.

12. Write a program for constructing Intermediate code generator

13. Write a program to generate DAG for the given expression

Software Required: Borland C / C++ /UNIX

07Z701 CRYPTOGRAPHY AND NETWORK SECURITY

3 0 0 3

Unit I

Introduction

Security Threats - OSI Security Architecture - Security Attacks - Security services -security mechanisms - Model for network security - classical Encryption Techniques - Block cipher principles – DES - Strength of DES.

10 Hours

Unit II

Symmentric Ciphers

AES - Multiple Encryption and Triple DES - Block cipher modes of operation - stream ciphers and RC4 - placement of encryption function - traffic confidentiality - key distribution - Random number generation.

10 Hours

Unit III

Public key Cryptography and Hash Function

Principles of public key cryptosystems - RSA algorithm-key Management - Diffie-Hellman exchange - Message Authentication – Hash functions - Secure Hash algorithm – Digital signatures and authentication protocols.

10 Hours

Unit IV

Network Security Applications

Kerberos - X.509 Authentication service - public key infrastructure - Email security -IP security - Web security.

10 Hours

Unit V

System Security

Intrusion detection – password management – Viruses and related Threats – Virus Counter measures – Firewall Design Principles – Trusted Systems. **10 Hours**

Total: 50 Hours

Textbook:

William Stallings, “Cryptography and Network Security – Principles and Practices”, Prentice Hall of India, Third Edition, 2003.

References:

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
2. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.
3. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003.

07Z702 WEB TECHNOLOGY

3 0 0 3

Unit I

Basic Network and Web Concepts

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

10 Hours

Unit II

Java Programming

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation. **10 Hours**

Unit III

Scripting Languages

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications. **10 Hours**

Unit IV

Dynamic HTML

Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data.

10 Hours

Unit V

Server Side Programming

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications. **10 Hours**

Total: 50 Hours

Textbook:

Deitel, Deitel and Nieto, "Internet and World Wide Web – How to program", Pearson Education Publishers, 2000.

References:

1. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002.
2. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
3. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.
4. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

07Z703 VISUAL PROGRAMMING USING VC++

3 0 0 3

Unit I

Windows Programming

Windows environment – a simple windows program – windows and messages – creating the window – displaying the window – message loop – the window procedure – message processing – text output – painting and repainting – introduction to GDI – device context – basic drawing – child window controls.

10 Hours

Unit II

Visual C++ Programming – Introduction

Application Framework – MFC library – Visual C++ Components – Event Handling – Mapping modes – colors – fonts – modal and modeless dialog – windows common controls – bitmaps. **10 Hours**

Unit III

The Document and View Architecture

Menus – Keyboard accelerators – rich edit control – toolbars – status bars – reusable frame window base class – separating document from its view – reading and writing SDI and MDI documents – splitter window and multiple views – creating DLLs – dialog based applications. **10 Hours**

Unit IV

Activex and Object Linking and Embedding (Ole)

ActiveX controls Vs. Ordinary Windows Controls – Installing ActiveX controls – Calendar Control – ActiveX control container programming – create ActiveX control at runtime – Component Object Model (COM) – containment and aggregation Vs. inheritance. **10 Hours**

Unit V

Advanced Concepts

Database Management with Microsoft ODBC – Structured Query Language – MFC ODBC classes – sample database applications – filter and sort strings – DAO concepts – displaying database records in scrolling view – Threading – VC++ Networking issues – Winsock – WinInet – building a web client – Internet Information Server – ISAPI server extension – chat application. **10 Hours**

Total: 50 Hours

Textbook:

Charles Petzold, "Windows Programming", Microsoft press, 1996 (Unit I – Chapter 1-9)

Reference:

1. David J.Kruglinski, George Shepherd and Scot Wingo, "Programming Visual C++", Microsoft press, 1999 (Unit II – V)
2. Steve Holtzner, "Visual C++ 6 Programming", Wiley Dreamtech India Pvt. Ltd., 2003.

07Z704 SOFTWARE QUALITY ASSURANCE

3 0 0 4

Unit I

Introduction

Software Process assessment overview - Assessment phases - Assessment principles - Assessment conduct -Implementation consideration - Quality management - Quality assurance plan - Considerations – Verification and Validation. **10 Hours**

Unit II

Configuration Management

Need for configuration Management - Software product nomenclature - configuration management functions - Baselines - Responsibilities - Need for automated tools - plan – SCM support functions - The requirement phase Design control - The implementation phase - Test phase - SCM Tools - Configuration accounting and audit. **10 Hours**

Unit III

Software Standards and Inspection

Definitions - Reason for software standards - Benefits - Establishing standards - Guidelines - Types of reviews - Inspection of objectives - Basic inspection principles - The conduct of inspection - Inspection training. **10 Hours**

Unit IV

Testing and Managing Software Quality

Testing: principles - Types - Planning - Development - Execution and reporting – Tools and methods - Real Time testing - quality management paradigm - Quality motivation – Measurement criteria - Establishing a software quality program - Estimating software quality. **10 Hours**

Unit V

Defect Prevention

Principles of software defect prevention - Process changes for defect prevention - Defect prevention considerations - Managements role - Framework for software process change - Managing resistance to software process change - Case studies. **10 Hours**

Total: 50 Hours

Textbook:

Watts S. Humphrey, "Managing the software process", Addison Wesley, 1999.

References:

1. Tsum S.Chow, "Software Quality Assurance a Practical Approach", IEEE Computer Society press, 1985.
2. Richard E. Fairley, "Software Engineering - A Practitioner's approach", McGraw Hill, 1982.

07G007CREATIVITY AND INNOVATION
vide Civil Engineering 07G007

07Z708 WEB TECHNOLOGY LABORATORY

0 0 3 2

List of Experiments

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout
3. Write programs in Java to create applets incorporating the following features:
   - Create a color palette with matrix of buttons
   - Set background and foreground of the control text area by selecting a color from color palette.
   - In order to select Foreground or background use check box control as radio buttons
   - To set background images
4. Write programs in Java to do the following.
   - Set the URL of another server.
   - Download the homepage of the server.
   - Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following:
   - HTTP request
   - FTP
   - SMTP
   - POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.
7. Write programs in Java using Servlets:
   - To invoke servlets from HTML forms
   - To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets
   - for conducting on-line examination.
   - for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.
9. Create a web page with the following using HTML

i) To embed a map in a web page
ii) To fix the hot spots in that map
iii) Show all the related information when the hot spots are clicked.

10. Create a web page with the following.

i) Cascading style sheets.
ii) Embedded style sheets.
iii) Inline style sheets.
iv) Use our college information for the web pages.

07Z709 VISUAL PROGRAMMING LABORATORY

0 0 3 2

List of experiments

Windows SDK / Visual C++

1. Writing code for simple window display.
2. Writing code for keyboard and mouse events.

Visual C++

1. Message and Image Display
2. Document view Architecture, Serialization
3. Dynamic controls
4. Menu, Accelerator, Tool tip, Tool bar
5. Creating DLLs and using them
6. Data access through ODBC
7. Creating ActiveX control and using it

07Z801 TCP/IP PROGRAMMING

3 0 0 3

Unit I
Internet Protocols
Internet protocol – Header, Routing, subnetting and supernetting, ARP and RARP, Internet control message protocol, IP Routing, Dynamic Routing protocols, IPV6 ceser Datagram protocol, IPV6.
10 Hours

Unit II
Transmission Control Protocol
TCP-services and leader connection establishment and termination, interactive dataflow, timeout and retransmission, TCP performance. **10 Hours**

Unit III
Implementation
ARP, IP routing; IP fragmentation and reassembly; TCP – input processing, finite state machine; output processing, Timer management, flow control. **10 Hours**

Unit IV
Socket Programming

Socket Abstraction, endpoint address creation, connection, sending and receiving, options, using socket calls in programs. **10 Hours**

Unit V

Socket Programming Applications

TCP echo client server – UDP echo client server- ping – FTP – other client server application. **10 Hours**

Total: 50 Hours

Textbook:

Douglas E. Comer, "Internetworking with TCP/IP", Volume 1, 2, Fourth edition, Pearson Education Asia, 2000.

References:

1. W. Richard Stevens, "UNIX network programming", Vol. 1, PHI, 1998. Chapters 5 & 8.
2. Richard Stevens, "TCP/IP Illustrated", Vol. 1, 2, 3, Pearson education India, 1996.
3. Behrouz A. Forouzan, "TCP/IP Protocol Suite", Tata McGraw Hill, 2000.
4. John Ray, "Using TCP/IP", PHI, 1999.

07G008 ORGANIZATIONAL BEHAVIOR AND MANAGEMENT
vide Civil Engineering 07G008

07Z001 MULTIMEDIA SYSTEMS

3 0 0 3

Unit I

Introduction to Multimedia

Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext. **10 Hours**

Unit II

Multimedia File Handling

Sounds-Images-Animation-Video **10 Hours**

Unit III

Digital Video and Image compression

Evaluating a compression system - Redundancy and visibility-Video compression techniques-Standardization of an algorithm - The JPEG image compression standard- ITU –T Standards - MPEG motion video compression standard-DVI Technology. **10 Hours**

Unit IV

Hardware & Software Tools

Multimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherels: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools. **10 Hours**

Unit V

Multimedia and Internet

Internetworking –connections -Internet services -Tools for WWW - Designing WWW. **10 Hours**

Total: 50 Hours

Textbook:

Tay Vaughan, "Multimedia: Making It Work", 7th Edition, Tata Mc-Grawhill. (Unit I, II, IV and V)

Reference:

John F.Koegel Buford, "Multimedia Systems", Pearson edition. (unit III)

07Z002 DATA WAREHOUSING AND MINING

3 0 0 3

Unit I

Introduction to Data Warehousing
Introduction, Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Implementation, Further Development, Data Warehousing to Data Mining. **10 Hours**

Unit II
Data Preprocessing, Language, Architectures, Concept Description
Why Preprocessing, Cleaning, Integration, Transformation, Reduction, Discretization, Concept Hierarchy Generation, Data Mining Primitives, Query Language, Graphical User Interfaces, Architectures, Concept Description, Data Generalization, Characterizations, Class Comparisons, Descriptive Statistical Measures.
10 Hours

Unit III
Association Rules
Association Rule Mining, Single-Dimensional Boolean Association Rules from Transactional Databases, Multi-Level Association Rules from Transaction Databases. **10 Hours**

Unit IV
Classification and Clustering
Classification and Prediction, Issues, Decision Tree Induction, Bayesian Classification, Association Rule Based, Other Classification Methods, Prediction, Classifier Accuracy, Cluster Analysis, Types of data, Categorisation of methods, Partitioning methods, Outlier Analysis. **10 Hours**

Unit V
Recent Trends
Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Databases, Multimedia Databases, Time Series and Sequence Data, Text Databases, World Wide Web, Applications and Trends in Data Mining. **10 Hours**

Total: 50 Hours

Textbook:

J. Han, M. Kamber, "Data Mining: Concepts and Techniques", Harcourt India / Morgan Kauffman, 2001.

References:

1. Margaret H.Dunham, "Data Mining: Introductory and Advanced Topics", Pearson Education 2004.
2. Sam Anahory, Dennis Murry, "Data Warehousing in the real world", Pearson Education 2003.
3. Alex Berson, Stephen J.Smith, "Data Warehousing, Data Mining & OLAP", MeGraw-Hill Edition, 2001.

07Z003 MICRO ELECTROMECHANICAL SYSTEMS

3 0 0 3

Unit I
MEMS and Microsystems
MEMS and microsystem products, evaluation of micro fabrication, micro-systems and microelectronics, applications of Microsystems, working principles of Microsystems, micro-sensors, micro-actuators, MEMS and micro-actuators, micro-accelerometers. Scaling Laws In Minaturlzation: Introduction, scaling In geometry, scaling in rigid body dynamics, the trimmer force scaling vector, scaling in electrostatic forces. Electromagnetic forces, scaling in electricity and fluidic dynamics scaling in heat, conducting and heat convection.
10 Hours

Unit II
Materials For MEMS And Microsystem
Substrates and wafers, silicon as a substrate material, ideal substrates for MEMS, single crystal silicon and wafers crystal structure, mechanical properties of Si, silicon compounds, SiO_2, SiC, Si_3N_4. and polycrystalline Silicon, silicon piezo resistors, gallium arsenide, quartz, piezoelectric crystals, polymers for MEMS, conductive polymers.
10 Hours

Unit III
Engineering Mechanics For Microsystems Design

Introduction, static bending of thin plates, circular plates with edge fixed, rectangular plate with all edges fixed and square plates with all edges fixed. Mechanical vibration, resonant vibration, microaccelerometers, design theory d damping coefficients. Thermo mechanics, thermal stresses. Fracture mechanics, stress intensity factors, fracture toughness and interfacial fracture machine. **10 Hours**

Unit IV

Basics of Fluid Mechanics In Macro and Meso Scales

Viscosity of fluids, flow patterns Reynolds number. Basic equation in continuum fluid dynamics, laminar fluid flow in circular conduits, computational fluid dynamics, incompressible fluid flow in micro conducts, surface tension, capillary effect and micropumping. Fluid flow in submicrometer and nanoscale, rarefield gas, kundsen and mach number and modeling of microgas flow, heat conduction in multilayered thin films, heat conduction in solids in submicrometer scale. Thermal conductivity of thin films, heat conduction equation for thin films.

10 Hours

Unit V

Microsystem Fabrication Process

Photolithography, photo resist and applications, light sources. Ion implantation, diffusion process, oxidation, thermal oxidation, silicon diode, thermal oxidation rates, Oxide thickness by colour. Chemical vapour deposition, principle, reactants in CVD, enhanced CVD physical vapour depusing, sputtering, deposition by epitaxy etching, chemical and plasma etching. Micromanufacturing And Microsystem Packaging: Bulk micromachining, isotropic and etching. wet etchants, etch stops, dry etching comparison of wet and etching. Surface micromachining: process in general, problems associated surface micromachining. The LIGA process, description, materials for substrates and photo resists, electroplating, the SLIGA process. Microsystem packaging, general considerations. The thee levels of microsystem packaging, die level, device level and system level, essential packaging technologies, die preparation, surface bonding wire bonding and sealing. Three dimensional packaging, assembly of Microsystems, selection of packaging materials.

10 Hours

Total: 50 Hours

Textbook:

Tai-Ran Hsu, "MEMS and Microsystems Design and Manufacture", Tata McGraw Hill Publishing Co. Ltd., New Delhi, 2002.

References:

1. Mark Madou, "Fundamentals of Micro fabrication", CRC Press, New York, 1997.
2. Julian W Gardner, "Microsensors: Principles and Applications", John Wiley & Sons, 1994
3. Sze S M, "Semiconductor Sensors", McGraw -Hill, New Delhi, 1994.
4. Chang CY and Sze S M, "VLSI Technology", McGraw Hill, New York, 2000.

07Z004 PARALLEL PROCESSING

3 0 0 3

Unit I

Introduction

Computational demand Parallel Processing-Mechanisms of implementing parallel processing-Parallel processing terminologies-Major issues in Parallel Processing. **10 Hours**

Unit II

Parallel Architectures

Loosely Coupled Systems- Tightly Coupled Systems-Interconnection networks: Linear and Ring, Shuffle Exchange, Two Dimensional Mesh. Hypercube. **10 Hours**

Unit III

Principles of parallel programming

Precedence Graph of a process-Data, Control, Temporal Parallelism- Message Passing Versus Shared Address space- Mapping -Granularity. **10 Hours**

Unit IV

Principles Of Parallel Algorithm Design

Design Approaches- Design issues-Performance measures and Analysis-Complexities-Anomalies in Parallel Algorithms, Case Study-Parallel Search Algorithms. **10 Hours**

Unit V

Shared Memory Multiprocessor Systems

Shared bus, Cross Bar, Multiport memory-Memory contention and Arbitration Techniques-Cache Coherence, Handling Shared Variables. **10 Hours**

Total: 50 Hours

Textbook:

Seyed H Roosta. "Parallel Programming and Parallel Algorithms", Springer Series. New York.2001.

References:

1. Michael J Quinn, "Parallel Computing Theory and Practice", McGraw Hill, Second edition, Singapore, 2003.
2. Kai Hwang and Feye A Briggs, "Computer Architecture and Parallel Processing", Tata McGraw Hill, New Delhi, 2001.
3. Barry Wilkinson, "Parallel Programming", Pearson Education, USA, 2002.

07Z005 FAULT TOLERANT COMPUTING SYSTEM

3 0 0 3

Unit I

Introduction

Physical Failures and Fault models - Elementary Testing Concepts - Structural level testing generation - Functional level testing generation - Random testing, Design for testability -Testability measures - Scan techniques, Easily testable networks and Function independent testing - Built in self test (BIST). **10 Hours**

Unit II

Fault Simulation

Introduction - Circuit modeling - Simulation models for elementary circuits -General Simulation algorithm and Evaluation algorithms - Fault modeling - Fault simulation methods - Parallel fault, Defective fault and Concurrent fault theory - Error models -Basic structural properties of parity checking codes - Classes of parity check codes and General decoding schemes - Unidirectional and Asymmetric codes - communication codes.

10 Hours

Unit III

Error Detection

Error detecting codes and their applications -Self-checking circuits - FT in Combinational circuits – FT sequential circuits - FT asynchronous sequential circuits - Fail safe sequential circuits - Architecture of Fault tolerant computers. **10 Hours**

Unit IV

Fault Tolerance

Fault Tolerant microprocessor's reliable shared bus design - Fault Tolerance in shared memory interconnections - Fault Tolerant loop architecture, Fault Tolerant tree network - dynamic re-configurable FT graph networks.

10 Hours

Unit V

System Diagnosis

Faults, Tests and Fault - Test Relationship – Digraph representation, Diagnosability analysis - Diagnosis algorithm - Distributed diagnosis - Studies on fault tolerant software. **10 Hours**

Total: 50 Hours

Textbook:

Pradhan D K, "Fault Tolerant Computing -Theory and Techniques", I, Prentice Hall. First Edition,

New Delhi, 1999.

References:

1. Anderson and Lee, "Fault Tolerant Principles and Practice". Prentice Hall New Delhi, 1998.
2. Parag K Lala. "Self Checking and Fault Tolerant Digital Design". Morgan Kaufmann, USA, 2001.

07Z006 ADVANCED COMPUTER ARCHITECTURE

3 0 0 3

Unit I

Fundamentals of Computer Design

Introduction - Measuring and Reporting performance - Quantitative Principles of computer design. Instruction set Principles and Examples: Introduction - Classifying Instruction set Architectures - Memory Addressing - Addressing Modes for signal processing - Type and size of operands -Operands for media and signal processing - operations in the instruction set - Instruction for control flow - Encoding an instruction set – the role of compiler.

10 Hours

Unit II

Pipelining

Introduction - The Major Hurdle of pipelining - pipeline Hazards - Implementation - Extending the MIPS pipeline to handle multicycle operations - crosscutting issues. **10 Hours**

Unit III

Instruction - Level parallelism

Concepts and challenges - overcoming data Hazards with Dynamic scheduling - Dynamic scheduling: Examples and the Algorithm - Reducing Branch costs with Dynamic Hardware Prediction - High Performance instruction delivery - Taking advantage of More ILP with Multiple Issue - Hardware - Based speculation - Studies of the Limitations of ILP - Limitations of ILP for Realizable processors – thread level parallelism – crosscutting issues.

10 Hours

Unit IV

Exploiting Instruction Level Parallelism

Exploiting Instruction - Level Parallelism with Software Approaches: Basic compiler Techniques for Exposing ILP - Static Branch Prediction - Static Multiple issue: The VLIW approach - advanced compiler support for Exposing and Exploiting ILP - Hardware support for Exposing more parallelism at compile Time - crosscutting issues: Hardware versus software speculation mechanisms. **10 Hours**

Unit V

Memory Hierarchy Design

Introduction - Review of the ABCs of the caches - Cache Performance - Reducing Cache Miss Penalty - Reducing Miss Rate - Reducing Cache Miss Penalty or Miss Rate via Parallelism - Reducing Hit Time - Main Memory and Organizations for Improving Performance - Memory Technology - Virtual Memory - Protection and Examples of Virtual Memory. **10 Hours**

Total: 50 Hours

Textbook:

John L. Hennessy and David Patterson, “Computer Architecture, A Quantitative Approach”, Third Edition, Elsevier, 2003.

Reference:

Vincent P. Heuring, Harry F. Jordan “Computer Systems Design and Architecture”, Addison Wesley, 1999.

07Z007 NETWORK PROGRAMMING

3 0 0 3

Unit I

Principles of Network and Design

Design objectives – Understanding the networking environment – Achieving the design goals – Importance of being predictable and fundamental design principles. - Designing the campus LAN – campus network design goals – Understanding the campus network – Designing the LAN topology – Campus hierarchical design.

10 Hours

Unit II

Designing the WAN

Designing the WAN topology – flat versus hierarchical, flat WAN topology – limitations of a flat design – hierarchical WAN topology – PVC and leased line Aggregation - Issues with hierarchical design – hierarchical layers – WAN design parameters- choosing the WAN technology – design considerations for serial links – designing IP over frame relay, and ISDN design issues with IP – fundamental IP routing design – designing an IP addressing plan – categorizing IP routing protocol and RIP. **10 Hours**

Unit III

Internet Management (SNMP)

SNMP-Organizational model-System Overview, The information model, communication model-Functional model, SNMP proxy server, Management information ,protocol remote monitoring. **10 Hours**

Unit IV

Broadband Network Management

Broadband network s and services, ATM Technology-VP,VC,ATM Packet, Integrated service, ATMLAN emulation, Virtual Lan. ATM Network Management-ATM Network reference model, Integrated local management Interface. ATM Management Information base, Role of SNMD and ILMIin ATM Management,M1,M2,M3,M4 Interface. ATM Digital Exchange Interface Management. **10 Hours**

Unit V

Network Management

Network management – requirements and systems – Network monitoring architecture – Performance monitoring – Fault monitoring – Account monitoring – Configuration control – Security control – SNMP background and concepts – structure of management information – SNMP protocol – Basic concepts – specifications – Transport level support – Groups. **10 Hours**

Total: 50 Hours

Textbook:

Cormac Long, "IP Network Design", Tata McGraw-Hill, 2001.

References:

1. William Stallings, "SNMP, SNMPv2, SNMPv3 and RMON1 and 2", Pearson education Asia, 3rd edition, 2001.
2. Salah Aiidarous, Thomas Plevayk, "Telecommunications Network Management Technologies and Implementations", Eastern Economy Edition IEEE press, New Delhi, 1998.
3. Charles P. Pfleeger. "Security in Computing", Prentice Hall, 1989.
4. ED Taylor, "Networking Handbook", TMH, 2000.
5. Mani Subramanian, "Network management - Principle and practice", Pearson education Asia, 2000.

07Z008 MOBILE COMPUTING

3 0 0 3

Unit I

Wireless Communication Fundamentals

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA . **10 Hours**

Unit II

Telecommunication Networks

Telecommunication systems – GSM – GPRS – DECT –TETRA -UMTS – IMT-2000 – Satellite Networks - Basics – Routing – Localization - Handover – FAMA and DAMA - Broadcast Systems – DAB - DVB.

10 Hours

Unit III

Wireless LAN

Wireless LAN – IEEE 802.11 - Architecture – services – MAC management– HIPERLAN – Blue Tooth.

10 Hours

Unit IV

Mobile Network Layer

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

10 Hours

Unit V

Transport And Application Layers

Traditional TCP – Classical TCP improvements– WAP. **10 Hours**

Total: 50 Hours

Textbook:

Jochen H.Schiller, "Mobile Communications", Pearson Education, Second Edition, 2007. (Unit I Chap 1,2 &3 - Unit II chap 4,5 &6 -Unit III Chap 7.Unit IV Chap 8 - Unit V Chap 9&10.)

References:

1. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2002. Unit I Chapter – 7&10-Unit II Chap 9)
2. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
3. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.
4. Hazysztof Wesolowshi, "Mobile Communication Systems", John Wiley and Sons Ltd, 2002.

07Z009 DISTRIBUTED COMPUTING SYSTEMS

3 0 0 3

Unit I

Introduction

Definition - System models - Design issue of distributed operating systems - Distributed Computing environment.

10 Hours

Unit II

Communication

Message Passing: Features and Issues – Synchronization - Buffering -Process addressing - Failure Handling - Remote Procedure Call: Model - Implementation - Stub generation - RPC messages -Marshaling - Server management - Call semantics. **10 Hours**

Unit III

Synchronization

Clock synchronization - physical clocks - logical clocks – Election algorithms - Mutual exclusion – Deadlocks.

10 Hours

Unit IV

Transactions

Transaction model- Classification -Implementation -Concurrency control. Process Management: Process migration: Features - Mechanism –Threads: Models, Issues, Implementation. **10 Hours**

Unit V

Resource Management

Features- Task assignment approach-Load Balancing approach-Load sharing approach. Name Services: Names, Identifiers and Addresses- Name resolution- Name space implementation- Domain Name System- Name Caches- Security. Case Study: Amoeba- Mach. **10 Hours**

Total: 50 Hours

Textbook:

Andrew S Tanenbaum, Marteen van steen "Distribute Systems Principles and Paradigms", PHI / Pearson Education, New Delhi, 2002.

References:

1. Pradeep K Sinha I "Distributed Operating Systems: Concepts and Design", PHI / Prentice Hall of India, New Delhi, 2004.
2. George Coulouris, Jean Dollimore, "Distributed Systems Concept and Design", Pearson Education, New Delhi, 2001.
3. Nancy A Lynch, "Distributed Algorithms", Morgan Kaufmann Publishers, Indian Reprint, New Delhi, 2000.

07Z010 GENETIC ALGORITHM AND APPLICATIONS

3 0 0 3

Unit I

Introduction To Evolutionary Computation

Biological and artificial evolution -Evolutionary computation and AI - Different historical branches of EC-GAs- EP-ES- GP -A simple evolutionary algorithm. **10 Hours**

Unit II

Search and Selection Operators

Recombination / Crossover for strings- one-point- multi-point-uniform crossover operators -Mutation for strings-bit-flipping -Recombination/Cros60ver and mutation rates -Recombination for real-valued representations- Fitness proportional selection and fitness scaling Ranking methods -Tournament selection.

10 Hours

Unit III

Evolutionary Combinatorial Optimization

TSP - Evolutionary algorithms for TSPs -Hybrid evolutionary and local search algorithms Theoretical Analysis Of Evolutionary Algorithm Schema theorems -Convergence of EAs –Computational time complexity of EAs -No free lunch theorem. **10 Hours**

Unit IV

Constraint Handling

Common techniques- penalty method repair methods -Analysis -Some examples. **10 Hours**

Unit V

Multiobjective Evolutionary Optimization

Pareto O1imality -Mu/1iobjective evolutionary algorithms. Genetic Programming: Trees as individuals -Major steps of genetic programming-, functional and terminal set initialization- crossover-mutation- fitness evaluation -Search operators on trees –Examples. **10 Hours**

Total: 50 Hours

Textbook:

1. Goldberg and David E “Genetic Algorithms in Search. Optimization and Machine Learning” Pearson Education, New Delhi, 2003.
2. Kalyamoy Deb, "Multi objective Optimization using Evolutionary Algorithms", John Wiley & Sons, First Edition, USA, 2003.

References:

1. Koza, John, Wolfgang Banzhaf, Kumar Chellapilla, Kalyanmoy Deb, Marco Dorigo, David-Fogel, Max Garzon, David Goldberg, Hitoshi Iba, and Rick Riolo(Eds.), "Genetic Programming", Academic Press. Morgan Kaufmann, USA, 1998.
2. John R.Koza, Forrest H Bennett III, David Andre, Martin A Keane, "Genetic Programming 111:Darwinian Invention and Problem Solving" Morgan Kaufmann, USA, 1999.

07Z011 EMBEDDED SYSTEMS

3 0 0 3

Unit I

Introduction to Embedded Systems

An embedded system -System processor -embedded System-On-chip (SOC) - Challenges - Design process -Examples of embedded system -UML Notations. **10 Hours**

Unit II

Embedded Computing Platform and OS

CPU -Component interfacing -Multi rate systems, Co-routine- RMS & EDF scheduling policies -Cross compilers. **10 Hours**

Unit III

RTOS

Real - time OS concepts - RTOS in embedded system - Interrupt routines - RTOS programming tools - Security issues - Examples for RTOS. **10 Hours**

Unit IV

Debugging Tools

System built-in debugging tools- Simulators -Emulators- Other debugging tools. **10 Hours**

Unit V

Networks

Distributed Embedded architecture- Networks for Embedded systems-Network based design -Internet enabled systems- Practical examples. CASE STUDIES: Embedded programming a Real time applications.

10 Hours

Total: 50 Hours

Textbook:

Raj Kamal, "Embedded Systems –Architecture, Programming and Design", Tata McGraw Hill Publishing Company Ltd. New Delhi, 2003

References:

1. David E Simon, "An Embedded software Primer", Pearson Education Asia, New Delhi, 2001.
2. Wayne Wolf, "Computer as Components Harcourt India Pvt. Limited" New Delhi, 2001.
3. Lewis, "Fundamentals of Embedded Software: Where C& Assembly meet", PHI, New Delhi, 2003.

07Z012 WEB SERVICES AND XML

3 0 0 3

Unit I

Introduction

Introduction to Internet and WWW – Introduction to HTML – CSS - Creating Markup with XML - Document Type Definition (DTD). **10 Hours**

Unit II

XML Technology

Schemas-DOM-Simple API for XML (SAX)-XML Path Language - Extensible Stylesheet Language Transformations (XSLT) - Extensible Stylesheet Language Formatting Objects-Introduction to Xlink,XPointer,XInclude and XBase. **10 Hours**

Unit III

Web Services

Evolution of Distributed Computing - Introduction to Web Services - Building Web Services Architecture. **10 Hours**

Unit IV

SOAP

Developing Web Services Using SOAP – Anatomy of a SOAP message - SOAP Encoding - SOAP Message Exchange Model – SOAP Communication - SOAP Security. **10 Hours**

Unit V

XML Security

Description and Discovery of Web Services - Web Services Security - XML Encryption -XML Signature – Introduction to Sun ONE. **10 Hours**

Total: 50 Hours

Textbook:

Deitel H M, Deitel P J, Nirto T R, Lin T M, "XML How to Program**"**, Pearson Edition, 2004.

References:

1. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, "Developing Java Web Services", Wiley Publishing Inc., 2004.
2. Steve Graham and Doug Davis, "Building Web services with Java", Pearson education 2008.
3. Charles F.Goldfarb and Paul Prescod, "The XML Handbook", Pearson education asia,2001.
4. Etban carami, "Web services Essential",O'Reilly ,2006.

07Z013 E -COMMERCE

3 0 0 3

Unit I

Introduction

Introduction-Electronic Commerce (E-Commerce) – Network Infrastructure for E-Commerce – Internet as a Network Infrastructure**.** **10 Hours**

Unit II

Network Security

Business of Internet Commercialization-Network Security – Firewalls. **10 Hours**

Unit III

Electronic Commerce and WWW

Electronic Commerce and WWW- Consumer Oriented E-Commerce- Consumer Oriented Applications. **10 Hours**

Unit IV

Electronic Payment Systems

Electronic Payment Systems-Inter organizational Commerce and EDI –EDI Implementation. MIME and Value Added Networks. **10 Hours**

Unit V

Intra Organizational E-Commerce

Intra Organizational E-Commerce-Corporate Digital Library-Advertising and Marketing on the Internet. **10 Hours**

Total: 50 Hours

Textbook:

Ravi Kalakota and Andrew B.Whinston "Frontiers of E-Commerce" , Second Edition, Pearson Education Asia, 2002.

References:

1. Kamesh K.Bajaj and Debjani Nag, "E-Commerce the Cutting Edge of Business", Tata McGraw Hill, 2000.
2. Elias M.Awad, "Electronic Commerce from Vision to Fulfillment", Prentice Hall of India, 2002.

07Z014 SOFTWARE PROCESS MANAGEMENT

3 0 0 3

Unit I

Software Process Maturity

A software maturity framework – The principles of software process change – Software process assessment – The initial process. **10 Hours**

Unit II

The Repeatable Process

Managing software organizations – The project plan – Software configuration management – Software quality assurance. **10 Hours**

Unit III

The Defined Process

Software standards – Software inspections – Software testing – Defining the software process – The software engineering process group. **10 Hours**

Unit IV

The Managed Process

Data gathering and analysis – Managing software quality. **10 Hours**

Unit V

The Optimizing Process

Defect prevention – Automating the software process – Contracting for software. **10 Hours**

Total: 50 Hours

Textbook:

Watts S. Humphrey ,"Managing the Software Process ", Pearson education.

07Z015 ENTERPRISE COMPUTING

3 0 0 3

Unit I

Enterprise Foundations

Enterprise architectural overview -object oriented software development for enterprise -Component Based software development for enterprise. Java Enterprise System. **10 Hours**

Unit II

Enterprise Data Enabling

Enterprise Data -Basis of JDBC -interfaces -drivers Advanced JDBC features. **10 Hours**

Unit III

Distributed Enterprise Communications Enabling

Distributed Enterprise Communications Basis –RMI Communication- CORBA communication -DCOM Communication. **10 Hours**

Unit IV

Services For Distributed Enterprise Systems

Naming Services, Directory and Trading services, Activation Services, Message Services, Transaction Services, Security Services and High assurance Enterprise applications. Enterprise Web Enabling: Web Browsers and Web Services in Enterprise. Web Programming, XML, Java Servlets – Java Server pages.

10 Hours

Unit V

Interoperability and Multitier Enterprise Computing

Java-Beans, EJB, Enterprise Application Integration, Interoperability between various computing technologies

10 Hours

Total: 50 Hours

Textbook:

Paul J Perrone, Venkata S.R. Krishna R and Chayanti, " Building Java Enterprise Systems withJ2EE" Techmedia , New Delhi, 2000.

References:

1. Mathew Siple -"The Complete guide -Java Database programming" Tata McGraw Hill. New Delhi, 1999.
2. Dustin R. Callaway - "Inside Servlets" -Addison Wesley Longman Inc., USA, 2001.
3. Tom Valesky -"Enterprise Java Beans" -Addison Wesley Longman Inc., USA, 2000.
4. Ed Roman -"Mastering EJB" -John Wiley & Sons, USA, 2001.
5. Jason Hunter -"Java Servlet Programming" -O' Reily & Associates Inc., USA, 2001.
6. Bill McCarty and Luke Cassady Dorion -"Java Distributed Objects" -TechMedla Publications, New Delhi, 1999.
7. Morgenthal JP, "Enterprise Application Integration with XML and Java" -Prentice Hall of India, New Delhi, 2001.
8. Stephanic Bodoff, Dale Green, Kim Haase, Eric Jendrock, Monica Pawlan, and Beth Stems, "The J2EE Tutorial", Addison Wesley Longman Inc., USA, 2002.

07Z016 ADVANCED JAVA PROGRAMMING

3 0 0 3

Unit I

Java Fundamentals

Java I/O streaming – filter and pipe streams – Byte Code interpretation - reflection – Dynamic Reflexive Classes – Threading – Java Native Interfaces- Swing. **10 Hours**

Unit II

Network Programming In Java

Sockets – secure sockets – custom sockets – UDP datagrams – multicast sockets – URL classes – Reading Data from the server – writing data – configuring the connection – Reading the header – telnet application – Java Messaging services. **10 Hours**

Unit III

Applications in Distributed Environment

Remote method Invocation – activation models – RMI custom sockets – Object Serialization – RMI – IIOP implementation – CORBA – IDL technology – Naming Services – CORBA programming Models - JAR file creation. **10 Hours**

Unit IV

Multi-Tier Application Development

Server side programming – servlets – Java Server Pages - Applet to Applet communication – applet to Servlet communication - JDBC – Using BLOB and CLOB objects – storing Multimedia data into databases – Multimedia streaming applications – Java Media Framework. **10 Hours**

Unit V

Enterprise Applications

Server Side Component Architecture – Introduction to J2EE – Session Beans – Entity Beans – Persistent Entity Beans – Transactions. **10 Hours**

Total: 50 Hours

Textbook:

Elliotte Rusty Harold, " Java Network Programming", O'Reilly publishers, 2000 (UNIT II)

References:

1. Ed Roman, **"**Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
2. Hortsmann & Cornell, "CORE JAVA 2 ADVANCED FEATURES, VOL II", Pearson Education, 2002.
3. Web reference: http://java.sun.com.
4. Patrick Naughton, "COMPLETE REFERENCE: JAVA2", Tata McGraw-Hill, 2003.

07Z017 CLIENT SERVER COMPUTING AND FRONT END TOOLS

3 0 0 3

Unit I

Introduction To Client/Server Computing

Market forces driving client server computing-client/server-real client/server- Tier architecture-fat server-fat client Vs fat servers-building block infrastructure. **10 Hours**

Unit II

Overview of Client, Server and OS

Client. server and OS-reaching or the limit-the OS wars. **10 Hours**

Unit III

Base Middleware

Stack NOSs - creation of single system image-RPC messaging and peer-to-peer-stacks ubiquitous communication - LAN server and NetWare-DCE post modern NOS. **10 Hours**

Unit IV

SOL Database Servers

SQL middleware and federated databases - data warehouse. **10 Hours**

Unit V

Introduction To Front End Tools

Introduction to client tools and application using power builder-Application painter- window painter-menu painter-data window painter-library painter - Case Study: Student/Employee Information system using front-end tool. **10 Hours**

Total: 50 Hours

Textbook:

Robert Orfali, Dan Harkey and Jeri Edwards, "Essential client/server Survival Guide", John Wiley & Sons, Singapore, 2003.

References:

1. Ivan, Bayross, "Power Builder Concepts and Applications", BPB Publications, New Delhi, 2000.
2. Smith and Guengerich. "Client/Server Computing". Prentice Hall of India, Second Edition, New Delhi 2002.

07Z018 VIRTUAL REALITY

3 0 0 3

Unit I

Virtual Reality Concepts

Basic settings-Hardware-Software requirements-Artificial Reality-Vir1ual Reality Application- Virtual Reality Developments. **10 Hours**

Unit II

Virtual Possibilities
Text-2D still Images. Animation-Video-Basic VRML concepts-Building objects Building scene- object interaction. **10 Hours**

Unit III
Virtual Reality Hardware-Software
3D Input devices-Head mounted devices-Feedback system-Head and Body Tracking- Total immersion-Glove-Cyberman- goggles. **10 Hours**

Unit IV
Virtual Power
3D modeling-walk through - Real Time Simulation of 3D Environments. **10 Hours**

Unit V
Case Studies: Creating own vir1ual reality - Design a head mounted Display-a 3D sound system-Design a Glove. **10 Hours**
Total: 50 Hours

Textbook:
Joe Gradecki's, "The Virtual Reality Construction Kit", John Wiley & Sons, USA, 1998.

References:

1. Lee Adams, "Visualization and Virtual Reality" , McGrawHill, Singapore, 1996.
2. Ron Wodaski, Donna Brown, "Virtual Reality Madness and More", SAMS Publishers, New Delhi, 1994.
3. Que's "Virtual Reality". SAMS Publishers, New Delhi, 1994.
4. Chirs Marrin and Bruce Compbell, "VRML-2", Techmedia Publishing, New Delhi, 1997
5. Gokul, "Multimedia Magic" BPB, New Delhi, 1998.

07Z019 NEURAL NETWORKS AND FUZZY SYSTEMS

3 0 0 3

Unit I
Feed Forward Networks and Supervised Learning
Biological Neural Networks - Artificial Neuron - Activation Functions, Learning rules - Hebb Network - Perceptron Networks – Adaline – Madaline - Back propagation networks - Learning factors - Linear Seperability. **10 Hours**

Unit II
Single Layer Feedback Networks
Hopfield Network-Associative Memories - Recurrent auto association memories – Bidirectional Associative memory - Boltzmann machine. **10 Hours**

Unit III
Unsupervised Learning Networks
Neural network based on competition - Maxnet - Hamming Network – Self Organizing feature Maps - Learning Vector Quantization - Adaptive Resonance Theory Network - Counter propagation Network. **10 Hours**

Unit IV
Fuzzy sets and relations
Crisp Set-Vagueness - Uncertainty and Impression – Fuzziness - Basic Definitions - Basic set theoretic Operations for Fuzzy – Types – Operations – Properties - Crisp and Fuzzy relations -Fuzzy relation - Cardinality Operations, Properties - Fuzzy Cartesian product and Composition – Non-Interactive fuzzy sets - Tolerance and Equivalence relations - Fuzzy Ordering relations -Composition of fuzzy relations - Crisp to fuzzy conversion - membership function. **10 Hours**

Unit V
Fuzzy-To-Crisp Conversions

Lambda cuts for fuzzy sets and relations – Definitions - Defuzzification Methods. Applications of Neural Networks and Fuzzy Logic: Pattern Recognition - Image compression - communication Control systems - Fuzzy Pattern Recognition - Fuzzy Image compression - Fuzzy Logic Controllers. **10 Hours**

Total: 50 Hours

Textbook:

1. Laurene Fausette, "Fundamentals of Neural Networks", Pearson Education, New Delhi, 2004.
2. Timothy Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, Singapore, 2000.

References:

1. Zimmermann H J, "Fuzzy set theory and its Applications", Allied Publishers Ltd, New Delhi, 1999.
2. Sivanandam S N and Paulraj M, "Introduction to Artificial Neural Networks", Vikas Publishing House Private Ltd, New Delhi, 2003.
3. Rajasekaran S and Vijayalakshmi Pai G A, "Neural Networks, Fuzzy Systems and Genetic Algorithms", Prentice Hall of India, New Delhi, 2003.
4. Haykins , "Neural Networks - A comprehensive foundation", PHI, Second edition, New Delhi, 2003.

07Z020 VLSI DESIGN

3 0 0 3

Unit I

Overview of VLSI Design Methodology

VLSI design process -Architectural design -Logical design –Physical design- Layout styles -Full custom -Semi custom approaches -Basic Electrical Properties Of MOS And CMOS Circuits: MOS device equations -Basic DC equations - Second order effects -MOS modules -Small signal AC characteristics -nMOS inverter -Steered input to an nMOS inverter - Depletion mode and enhancement mode pull ups –CMOS inverter -DC characteristics -Inverter delay -Pass transistor- Transmission gate. **10 Hours**

Unit II

VLSI Fabrication Techniques

An overview of wafer fabrication -Wafer processing -Oxidation -Patterning –Diffusion Ion Implantation –Circuit elements latchup –Latchup prevention techniques. **10 Hours**

Unit III

MOS and CMOS Circuit -Design Processes

Layer representations -Stick diagrams - nMOS design style –CMOS design style -Design rules: -Need for design rules -Mead conway design rules for the silicon gate nMOS process – CMOS nwell / pwell based design rules-Simp1e layout examples. Sheet resistance -Resistance estimation - Capacitance estimation - Driving large capacitive loads. **10 Hours**

Unit IV

nMOS and CMOS Circuit and Logic Design

Switch logic -Pass transistor and transmission gate -Gate logic –Other forms of CMOS logic -dynamic CMOS logic -Clocked CMOS logic – Pre-charged domino CMOS logic -Structured design - Simple combinational logic design examples -Parity generator -Multiplexers -Clocked sequential circuits -Two phase clocking -Charge storage-Dynamic register element nMOS and CMOS -Dynamic shift register –Semi static register –JK flip flop.

10 Hours

Unit V

Subsystem Design Process

Design of a 4 bit shifter -General arrangement of a 4-bit arithmetic processor -Design of a ALU subsystem -Implementation of ALU functions with an adder -Carry look ahead adder -Multiplexers -Serial parallel multipliers-Pipelined multiplier array. **10 Hours**

Total: 50 Hours

Textbook:

Doughlas, A Pucknell, and Kamran, Eshraghian, "Basic VLSI design", PHI / Prentice Hall of India, Third edition, New Delhi, 2004.

References:

1. Neil, Weste H E arid Kamran, Eshraghian, "Principles of CMOS VLSI design. A System Perspective", Pearson Education, Second Edition, New Delhi, 1993.
2. Eugene D Fabricus, "Introduction to VLSI Design", McGraw Hill International Edition, USA, 1990.
3. Amar Mukherjee, "Introduction to nMOS and MOS VLSI system design", Prentice Hall, USA, 1986.
4. Wayne Wolf, "Modern VLSI Design: System on Silicon", Pearson Education, Third Edition, New Delhi, 2002.
5. Carver Mead, and Lynn Conway, "Introduction to VLSI Systems", Addison Wesley, USA, 1980.

07Z021 SOFTWARE PATTERNS

3 0 0 3

Unit I

Introduction

Reusable software -Reusable Object Oriented software -class libraries -frameworks -Design Patterns.

10 Hours

Unit II

Design Patterns

Definition -Overview and motivation -categories -Relationships between patterns Descriptions of patterns- patterns and software architecture - pattern oriented analysis and Design **10 Hours**

Unit II

Architectural And Design Patterns

Introductions to architectural patterns - layers - pipes and filters Black board -distributed system brokers - Interactive systems -Adaptable systems. Introduction to design patterns – structural decomposition- Tactical and strategical patterns - organizations of work - Access control management –communications. **10 Hours**

Unit IV

Patterns Systems And Future

Classifications -selections -evaluation of patterns systems -UML & Patterns, Pattern mining -Pattern Organization and indexing -methods and Tools , Algorithm, Data Structures and patterns-
Formalizing patterns. **10 Hours**

Unit V

Case Studies

Developing application using Patterns -Arrays and stacks -Thread specific -Storage manager –Sort Utility- parsing -Binary Tree -Document Editor. **10 Hours**

Total: 50 Hours

Textbook:

1. Frank Bugchman and Regines meumier etal, "Pattern Oriented Software Architecture - A System of Patterns" ,John wiley & sons, USA, 2001.

References:

1. Erich Gamma, Richard Helm, Ralph Johhsons and John Vlissides, “Design / patterns: Elements of Reusable Object Oriented Software", Addison Wesley professional Computing series, Twelfth edition, USA, 2004.
2. Alan Shallowarg of James R.Trott, "Design Patterns Explained A New Perspective on Object -Oriented Design software Pattern Serious”, Addison Wesley. USA, 2002.
3. James W.Cooper, " Java Design Patterns - A tutorial Adison-Wesley Professional Computing Series”, USA, 2002.
4. William Brown, McCormick and Scott Thomas, "Antipatterns in Project Management”, John Wiley & Sons, USA, 2000.
5. Iran Jacobson and Griss Jacobson, " Software Reuse ", Addison Wesley, USA, 1997.

07Z022 GRID COMPUTING

3 0 0 3

Unit I

Grid Computing

Introduction - Definition - Scope of grid computing **10 Hours**

Unit II

Grid Computing Initiatives

Grid Computing Organizations and their roles – Grid Computing analog – Grid Computing road map.

10 Hours

Unit III

Grid Computing Applications

Merging the Grid sources – Architecture with the Web Devices Architecture. **10 Hours**

Unit IV

Technologies

OGSA – Sample use cases – OGSA platform components – OGSI – OGSA Basic Services. **10 Hours**

Unit V

Grid Computing Tool Kits

Globus Toolkit – Architecture, Programming model, High level services – OGSI .Net middleware Solutions.

10 Hours

Total: 50 Hours

Textbook:

Joshy Joseph & Craig Fellenstein, "Grid Computing", Prentice Hall of India, -2003.

Reference

Ahmar Abbas, "Grid Computing: A Practical Guide to technology and Applications", Charles River media – 2003.