



## ***FACULTY OF ENGINEERING***

***IASE University***

***Gandhi Vidya Mandir, Sardarshahr (Rajasthan) – 331401,  
INDIA***

**Teaching and Examination Scheme and Syllabus**

for

**BACHELOR OF ENGINEERING  
(Computer Science and Engineering)  
(Four-Year Full Time Degree Programme)  
(SEMESTER SCHEME)**

## **Rules And Guidelines For The Students**

1. The Bachelor of ENGINEERING (Computer Science and Engineering) course is a four year (Eight Semester) full time integrated degree programme.

### 2. ELIGIBILITY for Admission

A candidate seeking admission to the first year of the Bachelor of Engineering (Computer Science and Engineering) course shall be required to have passed 10+2 examination in Science with Physics, Chemistry and Mathematics from any board recognized by Rajasthan Board of Secondary Education, Rajasthan with at least 45% marks in aggregate for general category candidates, and 40% for SC/ST/OBC candidates.

### 3. ADMISSION procedure

Admission to the first year B.E. course shall be made on the basis of marks scored by the candidates in his/her 10+2 examination.

### 4. THE PROGRAMME

The Bachelor of Engineering (Computer Science and Engineering) is a four year (Eight semesters) full time degree program .The course structure and program administration are as follows.

### 5. COURSE STRUCTURE

The four year, eight semester teaching consists of Theory (Lectures and Tutorials) and Practicals/Sessionals (Laboratory work, Engineering Graphics, Workshop Practice and Project etc.).Examination will be held at the end of the each semester. Details of these are given in the Teaching & Examination Scheme.

### 6. PROGRAMME ADMINISTRATION

#### 6.1 Medium of Instruction

English shall be the medium of instruction and examination.

#### 6.2 EVALUATION

(a) Each subject will be evaluated through a theory paper at the end of the semester carrying 100 marks along with continuous evaluation of sessional work, carrying 50 marks. The theory paper shall be of three hour duration. The sessional work will consist of continuous assessment of student's performance by teachers in tutorial classes, and class tests.

- (b) Three class tests will be organized in each semester as per the scheme. The higher two out of the marks scored in the three tests will be considered for the sessional marks.
- (c) Evaluation of laboratory practical work and Engineering Graphics (Drawing) will be through continuous assessment throughout the semester as well as examination at the end of the semester.
- (d) At the end of the sixth semester the student will undergo practical training for a period of at least 45 working days in an industry / research organization related to his / her field of Study. At the end of the training, the student will submit its report to the Head of the Department within three weeks of the start of the seventh semester. The work of the practical training will be evaluated by a board of two teachers appointed by the Head of the Department. The later will counter sign the marks awarded by the board.
- (e) Project: The project work will be carried out in the VII & VIII semester. The topic of the project will be approved by the Head of the Department and the entire project work will be carried out under the guidance of a teacher of the department approved as project supervisor by the Head of the Department. The nature of the project work will consist of varying proportions of designing, fabrication, testing and analysis of results. The project topic can also be taken from a live industrial problem. The report of the completed project shall be signed by the guide and submitted to the Head of the Department on or before the last working day of the eighth semester. The evaluation of the project will be done by a board consisting of two examiners.

## 7. Promotion

- 7.1 The maximum span period of a program is eight years from the date of registration in the program.
- 7.2 The minimum marks for passing the examination for each semester shall be 50% in each practical/sessional, 40% in End Semester Examination of each theory paper, 50% in training and project, and 45% in the aggregate of all the subjects (theory, sessionals and project) of the semester.
- 7.3 A student will be permitted to attend the classes of the second/fourth/sixth/eighth semesters immediately after the examination of the first/third/fifth/seventh semester's examination, as the case may be, provided he/she has appeared in the first/third/fifth/seventh semester examination, respectively.
- 7.4 To be eligible for promotion to the 3<sup>rd</sup> semester of the program a student must have successfully cleared at least 10 subjects out of the 20 subjects including practicals of the first and second semesters taken together.
- 7.5 To be eligible for promotion to the 5<sup>th</sup> semester of the program a student must have successfully cleared at least 12 subjects out of the 23 subjects including practicals and sessionals of the third and fourth semesters taken together.

7.6 To be eligible for promotion to the 7<sup>th</sup> semester of the program a student must have successfully cleared at least half the subjects including practicals and sessionals of the fifth and sixth semesters taken together.

7.7 A student promoted to the third/fifth/seventh semesters, without having cleared all the papers, will have to appear and pass the backlog papers of the first/third/seventh semesters along with the regular examination of the first/third/fifth semesters and backlog papers of the second/fourth/sixth semesters along with the regular examination of the second/fourth/sixth semesters.

7.8 A candidate who has secured minimum marks to pass in each paper but has not secured the minimum marks required to pass in the aggregate for the semester concerned may take re-examination in not more than two papers to obtain the aggregate percentage required to pass the semester. The candidate will have to pay the requisite examination fee in order to be eligible for re- examination. In this case the marks secured by the candidate in the earlier examination in the paper concerned will be cancelled.

7.9 (a) Award of Division:

Securing 60% marks and above – I division

Securing 50% and above but below 60% - II division

Securing 45% and above but below 50% - Pass

For first B.E. to 3<sup>rd</sup> B.E. the division will be decided based on the marks obtained in the respective class/ year.

(b) For the declaration of Final B.E. result, marks will be totalled up as follows:

First B.E.: 50% of the marks secured

Second B.E.: 75% of the marks secured

Third B.E.: 100% of the marks secured

Final B.E.: 100% of the marks secured

- A student who has secured 75% marks and above shall be declared to have passed in first division with honors. However, for this the student must have cleared successfully all the subjects in single attempt in the final year period of his/her study.
- Similarly, to be eligible for a gold medal on account of having secured first position, the student must have cleared all subjects in single attempt and passed them with first division.

7.10 For determining merit position of the candidates at the final year level the marks obtained by them in the second, third and final year as described above shall only be considered.

7.11 If a student (who has successfully completed the programme) wishes to reappear in one or more theory papers of the first, second, third, fourth, fifth, sixth, seventh or eighth semesters for the purpose of improving his/her marks, he/she will be permitted to do so on payment of requisite examination fee along with the regular examinations of that semester; however, the total number of such attempts shall not exceed four theory papers during the span period of the programme. For this his/her previous performance in the paper/papers concerned shall be treated as cancelled. The application for such reappearing/re-examination must be submitted before the next examination of the corresponding semester. However, such candidates shall not be considered for award of gold medal.

7.12 A student to be eligible for award of degree has to clear all papers offered during four-year programme within the span period of eight years.

#### 8. LATERAL ENTRY

Students who have passed 3 year diploma examination from the Board of Technical Education, Rajasthan, or its equivalent with a minimum of 60% marks can be admitted to the Third Semester of the B. E. programme. However, they will be required to pass a course on Special Mathematics (BE300) for Diploma pass students. Students will have to pass this course before they are admitted to the seventh semester. However, the marks obtained in this course will not be counted for deciding the division of the student.

9. Attendance: All students are required to have 75% attendance in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

#### 10. RULES FOR CHANGE OF BRANCH FOR THE STUDENTS OF III SEM. B.TECH/ B.E.:

- I The faculty, on the basis of applications received from desirous students up to the date and time notified by the Director, will prepare a merit list of the students. The list will be prepared on the basis of overall merit of the I (Semester) result only and the applications for change of branch will be processed as per the merit list.
- II Request for change from B.E. to B. Tech. programme or vice versa by any student will be considered only if, the candidate fulfills basic admission criteria for the desired programme and using the guidelines below: If the candidate is eligible for change from B. Tech. to B.E. & vice-versa is found deficit in the course coverage of first and second semester, he will have to pass the deficit courses before the candidate is admitted to the seventh semester. However, the marks obtained in the deficit courses will not be added for deciding the division of the student.

#### **ELIGIBILITY CRITERIA:**

- (a) The students must have passed the I Semester B.Tech./B.E Examination in all components in one attempt with at least 60% marks in aggregate. The student with back papers or whose result has not been declared will not be considered for change of branch.
- (b) In case any student has applied for re-valuation/ re-totaling of his/her marks of I Semester B.Tech/B.E and the result has not been received till the time of change of branch, such a student will not be entitled for change of branch on the basis of his/her subsequently revised result.

#### **PROCEDURE:**

- 1) Applications in a specified format (developed by the faculty) for change of branch will be invited by the Director/Principal of the faculty on the basis of the result of I (Semester) B. Tech./ B.E in duplicate, upto the date notified by IASE University. One copy of each such application be sent to IASE University by that date.
- 2) The students would submit a photo copy of I (Semester) Examination mark sheet of that year along with the application. The student may give as many preferences as possible against the vacant seats in respective college.
- 3) A seat matrix shall be prepared by the faculty, as per the details of the vacant seats (admitted through direct admission) in the previous year.
- 4) Due to change of branch, the strength of student in any branch should not fall short of 75% of the enrolled students in that branch in that year. And under no circumstances, due to change of branch, the number of seats in a particular branch in a college shall exceed the sanctioned strength approved by the AICTE, for that batch.
- 5) All students who have applied for the change of branch in-time will be called for counseling by the admission council of the faculty and considered for change of branch as per merit, preference and availability of seat. However, at the time of the counseling, if any student wishes to withdraw his/her application he/she can do so by a written request. In case any student does not present himself/herself for counseling, his/her branch will be changed as per the preference mentioned in the application form, merit and availability of seat.

## 11. RULES FOR THE AWARD OF GRACE MARKS

### A. UNDER GRADUATE/ POST GRADUATE (MAIN/SUPPLYMENTARY EXAMINATIONS UNDER THE FACULTIES OF ENGINEERING & TECHNOLOGY.

Grace marks to the extent of 1% of the aggregate marks prescribed for an examination will be awarded to a candidate failing in not more than 25% of the total number of theory papers, practicals, sessionals, dissertation, viva-voce and the aggregate, as the case may be in which minimum pass marks have been prescribed; provided the candidate passes the examination by the award of such Grace marks. For the purpose of determining the number of 25% of the papers, only such theory papers practicals, dissertation, viva-voce etc. would be considered, of which, the examination is conducted by the University.

N.B.:- If 1% of the aggregate marks or 25% of the papers works out in fraction, the same will be raised to the next whole number. For example, if the aggregate marks prescribed for the examination are 450, grace marks to the extent of 5 will be awarded to the candidate, similarly, if 25% of the total papers is 3.2, the same will be raised to 4 papers which grace marks can be given.

#### GENERAL:-

- A candidate passes in a paper/ practical or the aggregate by the award of grace marks will be deemed to have obtained the necessary minimum for a pass in that paper/ practical or in the aggregate and shown in the marks sheet to have passed by grace. Grace marks will not be added to the marks obtained by a candidate from the examiners nor will the marks obtained by the candidate be subject to any deduction due to award of grace marks in any other paper/ practical or aggregate.
- If a candidate passes the examination but misses First or Second Division by one mark, his aggregate will be raised by one mark so as to entitle him for the first or second division, as the case may be. This one mark will be added to the paper in which he gets the least marks and also in the aggregate by showing +1 in the tabulation register below the marks actually obtained by the candidate. The marks entered in the marks-sheet will be inclusive of one grace mark and it will not be shown separately.
- Non appearance of a candidate in any paper will make him ineligible for grace marks. The place of a passed candidate in the examination list will, however be determined by the aggregate marks he secures from the examiners, and he will not, by the award of grace marks, become entitled to a higher division.
- Distinction won in any subject at the examination is not to be forfeited on the score that a candidate has secured grace to pass the examination.

Note: - The Grace marks will be awarded only, if candidate appears in all the papers prescribed for the examination.

**TEACHING & EXAMINATION SCHEME**  
**for B.E. – Four Year (8 Semester) Full Time Degree Programme**

**B.E. – First Year****Semester - I**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	BE101	English	3	1	-	30	20	50	100	150
2	BE102	Engineering Mathematics-I	3	1	-	30	20	50	100	150
3	*BE103/203	Engg. Physics/Engg. Chemistry	3	1	-	30	20	50	100	150
4	BE104	Computer Systems & Programming	3	1	-	30	20	50	100	150
5	BE105	Electrical & Electronics Engg.	3	1	-	30	20	50	100	150
(PRACTICALS/SESSIONALS)										
6	*BE106/208	Engg. Physics/ Engg. Chemistry Lab	-	-	3	50	-	50	50	100
7	BE107	Computer Programming Lab	-	-	3	50	-	50	50	100
8	BE108	Practical Geometry	-	-	3	50	-	50	50	100
9	BE109	Workshop Practice	-	-	3	50	-	50	50	100
10	BE110	Electrical & Electronics Lab	-	-	2	50	-	50	50	100
		Total Hours	15	5	14					

TA – Teacher’s Assessment

CT – Class Test

ESE – End Semester Examination

Total Contact Hours – 34

Total Marks – 1250

\*Half of the intake of the student of the faculty shall study Physics and rest of the students shall study Engineering Chemistry in First Semester. In Second Semester, the students shall interchange the subjects.

**TEACHING & EXAMINATION SCHEME  
for B.E.– Four Year (8 Semester) Full Time Degree Programme**

**B.E. – First Year****Semester - II**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	BE201	Communication Techniques	3	1	-	30	20	50	100	150
2	BE202	Engineering Mathematics –II	3	1	-	30	20	50	100	150
3	*BE203/103	Engg. Chemistry /Engg. Physics	3	1	-	30	20	50	100	150
4	BE204	Engineering Mechanics	3	1	-	30	20	50	100	150
5	BE205	Mechanical Engineering	3	1	-	30	20	50	100	150
6	BE206	Environmental Studies& Disaster Management	3	1	-	30	20	50	100	150
(PRACTICALS/SESSIONALS)										
7	BE207	Language Lab	-	-	2	45	-	45	30	75
8	*BE208/106	Engg. Chemistry /Engg. Physics	-	-	3	50	-	50	50	100
9	BE209	Environmental Engg. Lab	-	-	2	45	-	45	30	75
10	BE210	Machine Drawing	-	-	3	50	-	50	50	100
11	BE211	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100
		Total Hours	18	6	10					

TA – Teacher’s Assessment

CT – Class Test

ESE – End Semester Examination

Total Contact Hours – 34

Total Marks – 1350

\*Half of the intake of the student of the faculty shall study Physics and rest of the students shall study Engineering Chemistry in First Semester. In Second Semester, the students shall interchange the subjects.

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Second Year** **Semester - III**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE301	Engineering Mathematics-III	3	1	-	30	20	50	100	150
2	CSE302	Digital Electronics	3	1	-	30	20	50	100	150
3	CSE 303	Electronics Circuits	3	1	-	30	20	50	100	150
4	CSE 304	Discrete Structures	3	1	-	30	20	50	100	150
5	CSE 305	Object Oriented Programming	3	1	-	30	20	50	100	150
6	CSE 306	Data Structures	3	1	-	30	20	50	100	150
(PRACTICALS/SESSIONALS)										
7	CSE 307	Digital Electronics Lab.	-	-	2	50	-	50	50	100
8	CSE 308	Electronic Circuits Lab.	-	-	2	50	-	50	50	100
9	CSE 309	Object Oriented Programming Lab.	-	-	2	50	-	50	50	100
10	CSE 310	Data Structure Lab.	-	-	2	45	-	45	30	75
11	CSE 311	Computer Applications Lab	-	-	2	45	-	45	30	75

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-32

Total Marks-1350

	BE 300*	Special Mathematics	3	1	-	30	20	50	100	150
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\*This Course of Special Mathematics (BE300) is compulsory for student's having been admitted in B.E after passing Engineering Diploma. Students have to pass this course, however the marks obtained in this will not be counted for deciding the division of the student.

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Second Year** **Semester - IV**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE 401	Communication Engineering	3	1	-	30	20	50	100	150
2	CSE 402	Principles of Programming Languages	3	1	-	30	20	50	100	150
3	CSE 403	Computer Organization & Architecture	3	1	-	30	20	50	100	150
4	CSE 404	Database & File Systems	3	1	-	30	20	50	100	150
5	CSE 405	Engineering Management & Economics	3	1	-	30	20	50	100	150
6	CSE 406	System Software	3	1	-	30	20	50	100	150
(PRACTICALS/SESSIONALS)										
7	CSE 407	Communication Engineering Lab.	-	-	2	50	-	50	50	100
8	CSE 408	Programming Laboratory	-	-	2	45	-	45	30	75
9	CSE 409	Computer Organizing & Architecture Lab.	-	-	2	45	-	45	30	75
10	CSE 410	Database & File System Lab.	-	-	2	50	-	50	50	100
11	CSE 411	System Software Lab	-	-	2	50	-	50	50	100
12	CSE 412	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-34  
Total Marks-1450

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Third Year** **Semester - V**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE 501	Software Engineering	3	1	-	30	20	50	100	150
2	CSE 502	Microprocessor and Interfaces	3	1	-	30	20	50	100	150
3	CSE 503	E-Commerce	3	1	-	30	20	50	100	150
4	CSE 504	Computer Graphics	3	1	-	30	20	50	100	150
5	CSE 505	Telecommunication Fundamentals	3	1	-	30	20	50	100	150
6	CSE 506.1	Logical & Functional Programming	3	1	-	30	20	50	100	150
	CSE 506.2	Information Theory and Coding								
	CSE 506.3	Advanced Data Structure								
(PRACTICALS/SESSIONALS)										
7	CSE 507	Software Engineering Lab	-	-	2	50	-	50	50	100
8	CSE 508	Microprocessor Lab	-	-	2	50	-	50	50	100
9	CSE 509	E-Commerce Lab	-	-	2	45	-	45	30	75
10	CSE 510	Computer Graphics Lab	-	-	2	45	-	45	30	75
11	CSE 511	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-32

Total Marks-1350

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Third Year** **Semester - VI**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE 601	Operating Systems	3	1	-	30	20	50	100	150
2	CSE 602	Computer Networks	3	1	-	30	20	50	100	150
3	CSE 603	Design & Analysis of Algorithms	3	1	-	30	20	50	100	150
4	CSE 604	Embedded Systems	3	1	-	30	20	50	100	150
5	CSE 605	Theory Of Computation	3	1	-	30	20	50	100	150
6	CSE 606.1	Digital Signal Processing	3	1	-	30	20	50	100	150
	CSE 606.2	Advanced Software Engineering								
	CSE 606.3	Microwave and Satellite Communication								
(PRACTICALS/SESSIONALS)										
7	CSE 607	Shell Programming Lab	-	-	2	50	-	50	50	100
8	CSE 608	Network lab	-	-	2	50	-	50	50	100
9	CSE 609	Web Programming lab	-	-	2	45	-	45	30	75
10	CSE 610	Microcontroller lab	-	-	2	45	-	45	30	75
11	CSE 611	Entrepreneurship Development	-	-	2	50	-	50	50	100
12	CSE 612	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-34  
Total Marks-1450

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Forth Year** **Semester - VII**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE 701	Compiler Construction	3	1	-	30	20	50	100	150
2	CSE 702	Data Mining And Ware Housing	3	1	-	30	20	50	100	150
3	CSE 703	Logic Synthesis	3	1	-	30	20	50	100	150
4	CSE 704	Artificial Intelligence	3	1	-	30	20	50	100	150
5	CSE 705	Multimedia Systems	3	1	-	30	20	50	100	150
6	CSE 706.1	Service Oriented Architectures	3	1	-	30	20	50	100	150
	CSE 706.2	Optical Communication								
	CSE 706.3	Real Time Systems								
(PRACTICALS/SESSIONALS)										
7	CSE 707	Compiler Design Lab	-	-	2	45	-	45	30	75
8	CSE 708	Data Mining And Ware Housing Lab	-	-	2	45	-	45	30	75
9	CSE 709	Logic Synthesis Lab	-	-	2	45	-	45	30	75
10	CSE 710	Project Stage I	-	-	2	45	-	45	30	75
11	CSE 711	Practical Training Seminar			-	30	-	30	20	50
12	CSE 712	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-32  
Total Marks-1350

**TEACHING & EXAMINATION SCHEME**  
**For B.E.(Computer Science and Engineering)– Four Year (8 Semester) Full Time**  
**Degree Programme**  
**B.E. (CSE) – Forth Year** **Semester - VIII**

S.No.	Course No.	Subject	Period			Examination Scheme				
			L	T	P	Sessional Exam			ESE	TOTAL
						TA	CT	TOTAL		
(THEORY)										
1	CSE 801	Information System and Securities	3	1	-	30	20	50	100	150
2	CSE 802	CAD FOR VLSI Design	3	1	-	30	20	50	100	150
3	CSE 803	Advanced computer Architectures	3	1	-	30	20	50	100	150
4	CSE 804.1	Distributed Systems	3	1	-	30	20	50	100	150
	CSE 804.2	Image Processing								
	CSE 804.3	Natural Language Processing								
(PRACTICALS/SESSIONALS)										
5	CSE 805	Information System and Securities Lab	-	-	4	45	-	45	30	75
6	CSE 806	VLSI Design Lab	-	-	2	45	-	45	30	75
7	CSE 807	X-Windows Programming Lab	-	-	2	50	-	50	50	100
8	CSE 808	Project Stage II	-	-	4	200	-	250	100	350
9	CSE 809	Seminar Presentation			2	-	-	-	-	150
10	CSE 810	Discipline & Extracurricular Activities	-	-	-	-	-	100	-	100

TA- Teacher's Assessment

CT- Class Test

ESE- End Semester Examination

Total Contact Hours-32  
Total Marks-1450

**BE 101-ENGLISH****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT – I****Short Stories**

- “The Gift of the Magi” by O. Henry
- “The Fortune-Teller” by Karl Capek
- “The Nightingale and the Rose” Oscar Wilde

**UNIT – II****Short Stories**

- “Dr. Heidegger’s Experiment” by Nathaniel Hawthorne
- “The Three Dancing Goats” by Anonymous
- “The Accompanist” by Anita Desai

**UNIT – III****Poems**

- “Mending Wall” by Robert Frost
- “This is Going to Hurt Just a Little Bit” by Odgen Nash
- “Death and Leveler” by James Shirley
- “Last Lesson of the Afternoon” by D. H. Lawrence
- “Night of the Scorpion” by Nissim Ezekiel

**UNIT – IV****Short Plays**

- “The Dear Departed” by Stanley Houghton
- “Refund” by Fritz Karinthy
- “Monkey’s Paw” by W. W. Jacobs

**UNIT – V****Essays**

- “Of Studies” by Francis Bacon
- “Third Thoughts” by E. V. Lucas
- “Toasted English” by R. K. Narayana

**BE 102-ENGINEERING MATHEMATICS-I****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT – I****Differential Calculus**

- . Asymptotes (Cartesian Coordinates Only)
- . Curvature
- . Concavity, Convexity and Point of Inflexion (Cartesian Coordinates Only)
- . Curve Tracing (Cartesian and Standard Polar Curves – Cardioids, Lemniscates of Bernoulli, Limacon, Equiangular Spiral)

**UNIT – II****Differential Calculus**

- . Partial Differentiation, Euler's Theorem on Homogeneous Functions
- . Approximate Calculations
- . Maxima & Minima of Two and More Independent Variables
- . Lagrange's Method of Multipliers

**UNIT – III****Integral Calculus**

- . Applications in Finding the Length of Simple Curves
- . Surface and Volumes of Solids of Revolution
- . Double Integral, Areas & Volumes by Double Integration
- . Change of Order of Integration
- . Beta Function and Gamma Function (Simple Properties)

**UNIT - IV****Differential Equations**

- . Differential Equations of First Order and First Degree – Variable Separable, Homogeneous Forms, Reducible to Homogeneous Form, Linear Form, Exact Form, Reducible to Exact Form
- . Linear Differential Equations of Higher Order with Constant Coefficients Only

**UNIT - V****Differential Equations**

- . Second Order Ordinary Differential Equations with Variable Coefficients
- . Homogeneous and Exact Forms
- . Change of Dependent Variable
- . Change of Independent Variable, Normal Forms
- . Method of Variation of Parameter

**BE 103-ENGINEERING PHYSICS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****Interference of Light:-**

- Interference as superposition of waves in space. Intensity variation. Bright and dark fringes. Fringe width. Conditions for observing interference of Light. Newton's Rings: Theory and experiment for determining wavelength of light and refractive index of liquid
- Michelson's Interferometer: Production of circular & straight line fringes, Determination of wavelength of light, Determination of wavelength separation of two nearby wavelengths

**Polarization of Light:-** types of polarization, Nicol prism, Double refraction, elliptically and circularly polarized light, Brewster's law, Malus law, Quarter wave and half wave plates.

**UNIT - II****Diffraction of Light:**

Fresnel diffraction:- narrow slit. Fraunhofer's diffraction:-Single Slit Diffraction: Quantitative description of single slit, Positions of maxima minima and width of central maximum, Intensity variation.

- Diffraction Grating: Construction and theory, Formation of spectrum by plane transmission grating, Missing and overlapping of spectra, Determination of wavelength of light using plane transmission grating
- Resolving Power: Geometrical & Spectral, Rayleigh criterion, Resolving power of diffraction grating,

**UNIT - III**

**Lasers:-** Spatial and temporal coherence, Coherence length, Coherent time and 'Q' factor for light  
Theory of Laser Action: Einstein's coefficients components of a laser, Threshold condition for laser action  
Theory, design and application of He-Ne and Semiconductor lasers

**Holography**

- Basic theory of holography, Basic requirement of a holographic laboratory
- Application of holography in microscopy and interferometry

**UNIT - IV****Quantum Mechanics:**

Origin of quantum nature of light: Black body radiation and photoelectric effect.

Unability of wave theory of light to explain photoelectric effect. Einstein Photoelectric Equation.

De-Broglie Matter waves. Uncertainty principle

- Compton effect and quantum nature of light
- Schrödinger's Wave Equation: Time dependent and time independent cases
- Physical interpretation of wave function and its properties, boundary conditions
- Particle in one and three dimensional boxes

**UNIT - V**

**Theory of relativity-**Inertial frame of reference , Non-inertial frame of reference, Michelson- Morley experiment, Einstein's special Theory of Relativity Lorentz Transformation, length contraction, time dilation, addition of velocities, variation of mass with velocity, Equivalence of mass and energy.

**BE 203-ENGINEERING CHEMISTRY****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****Water**

- Common Impurities, Hardness
- Determination of hardness by Clark's test and complexometric (EDTA) method, Degree of hardness

**Municipal Water Supply**

- Requisites of drinking water, Purification of water, Sedimentation, Filtration, Sterilization, Break point chlorination

**Water for Steam Making**

- Boiler troubles carry over, Corrosion, Sludge and scale formation and caustic embrittlement

**Methods of Boiler Water Treatment**

- Preliminary treatments, Preheating, Lime-Soda process, Permutit (Zeolite) process, Deionizer or Demineralizer, Feed water conditioning, Internal treatment, Blow down
- Numerical problems based on water treatment (Lime-Soda process)

**UNIT - II****Fuels**

- Chemical Fuels: Origin and classification of fuels

**Solid Fuels**

- Coal, Proximate and ultimate analysis of coal, Significance of the constituents
- Gross and net calorific value, Determination of calorific value by Bomb calorimeter
- Coke – Metallurgical, Coke-carbonization process
- Manufacture of coke-beehive Coke oven and byproduct coke ovens

**Liquid Fuels**

- Advantages, Petroleum and refining of petroleum, Synthetic petrol, Refining and reforming of gasoline
- Knocking, Octane number, Knocking – Anti knocking agents, Cracking

**Gaseous Fuels**

- Advantages, Manufacture, Composition and calorific value of coal gas and oil gas
- Determination of calorific value by Junker's calorimeter, Flue gas analysis by Orsat Apparatus

**UNIT - III****Phase Rule**

- Statement, Definition and meaning of the terms involved
- Application to one component system (Water and Sulphur systems)
- Study of two component system (Ag-Pb system)

**Polymers**

- Plastics: Classifications and constituents of plastics and their uses, Preparation, properties and uses of polyethylene, Bakelite, Teryline and Nylon
- Rubber: natural rubber, Vulcanization, Synthetic rubber viz. Buna-S, Buna-N, Butyl and Neoprene rubbers

**Lubricants**

- Classification, Types of lubrication, properties and uses
- Viscosity & Viscosity index, flash & fire point, Cloud and pour point, Emulsification

**UNIT - IV****Corrosion**

- Definition and its significance, Theories of corrosion, Galvanic cell and concentration cell, Pitting and Stress corrosion, Protection against corrosion, Protective metallic coating

**New Engineering Materials**

- Brief idea of following: Superconductors, organic electronic materials, Fullerenes and Optical fibers

**UNIT - V****Cement**

- Manufacturing of Portland cement, Vertical shaft kiln technology
- Chemistry of setting and hardening

**Refractories**

- Definition, properties, classification, properties of silica and fireclay refractories

**Glass**

- Preparation, varieties and uses

**BE 104-COMPUTER SYSTEMS AND PROGRAMMING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****Introduction**

- . Types of computers and generations
- . Basic architecture of computers and its building blocks
- . Input-Output devices, Memories

**UNIT - II****Number Systems**

- . Binary, octal, decimal and hexadecimal representation of numbers
- . Integers and floating point numbers
- . Representation of characters, ASCII and EBCDIC codes
- . Binary Arithmetic: addition, subtraction, complements

**UNIT - III****Classification of Computer Languages**

- . Machine, assembly and high level languages
- . Brief idea of operating system
- . Assembler, compiler and interpreter

**Programming in 'C'**

- . Need of programming languages, Defining problems
- . Flowcharts and algorithm development

**UNIT - IV**

- . Data types, constants, variables, operators and expressions
- . Input and output statements, Conditional and control statements, Arrays

**UNIT - V**

- . Structures and unions
- . Pointers
- . File handling

**BE 105-ELECTRICAL AND ELECTRONICS ENGINEERING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****DC Circuits**

- Classification of circuit elements, V-I characteristics and current sources – ideal and practical, source conversion
- Kirchoff's voltage and current laws, Loop analysis
- Star-delta and Delta-star transformations, Superposition theorem & Thevenin's theorem

**UNIT - II****Single Phase AC Circuits**

- Single phase EMF generation, Instantaneous, average and RMS values
- Phase diagram, power and power factor for R, L, C, RL, RC and RLC circuits, complex representation of impedances
- Solution of RLC series, parallel and series-parallel circuits.

**Three Phase AC Circuits**

- Three phase EMF generation, Star and delta connections, Line and phase quantities
- 3-phase balance circuits – phasor diagram, solution and power measurement

**UNIT - III****Single Phase Transformer**

- Faraday's law of electromagnetic induction
- Construction and working of transformer
- Ideal transformer: EMF equation, phasor diagram, voltage and current relationship (transformation ratio)

**UNIT - IV****p-n Junction Diodes**

- Intrinsic and extrinsic semiconductors, open circuited p – n junction and space charge region
- The biased p – n junction and voltage – ampere characteristics

**Diode Circuits**

- Single phase half wave and bridge rectifiers – peak inverse voltage
- DC and RMS load currents and voltages, ripple factor, Introduction to filters

**UNIT - V****Transistor**

- PNP and NPN transistors, transistor current components, Common emitter Configuration- input output characteristics
- Transistor operating regions: active region, saturation region and cut off region
- Transistor as an amplifier and a switch

**BE 106-PHYSICS LAB****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****OPTICS**

1. To determine the wave length of monochromatic light with the help of Fresnel's Biprism.
2. To determine the wave length of Sodium light by Newton's rings.
3. To determine the specific rotation of Glucose (Sugar) solution using a Polarimeter.
4. To determine the wave length of Sodium light by Michelson's Interferometer.
5. To determine the wavelength of prominent lines of mercury by plane diffraction grating with the help of a spectrometer.
6. To determine the dispersive power of material of prism for violet and yellow colors of mercury Light with the help of a spectrometer.
7. To determine the height of water tank with the help of a sextant.
8. To measure the numerical aperture of an optical fiber.
9. To determine the coherent length and coherent time of laser using He-Ne Laser.
10. To determine the profile of He-Ne Laser beam.

**ELECTRONICS / ELECTRICAL**

11. To convert a galvanometer into an Ammeter of range 1.5 Amps and calibrate it.
12. To convert a galvanometer into an Voltmeter of range 1.5 Volts and calibrate it.
13. To study the variation of semiconductor resistance with temperature and hence determine the band gap of semiconductor in the form of reverse biased P-N junction diode.
14. To determine the specific resistance of the material of a wire by Carey-Foster's bridge.
15. To determine the ferromagnetic constants, retaintivity, permeability and susceptibility by tracing I-H curve using CRO.
16. To study the variation of thermo emf of Iron-Copper thermo couple with temperature.
17. To study the charge & discharge of a condenser and hence determine time constant.  
(Both current and voltage graphs are to be plotted)
18. To determine the high resistance by the method of leakage, using a Ballistic Galvanometer.
19. To determine dielectric constant of a liquid using moving coil Ballistic Galvanometer with standard parallel plate condenser.
20. Study G. M. counting system and hence study absorption coefficient of Lead using lead sheets.

**BE 208-ENGINEERING CHEMISTRY LAB****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments****(i) VOLUMETRIC ANALYSIS**

1. Determination of Hardness of Water by different methods.
2. Determination of available chlorine in water.
3. Determination of Copper Sulphate Iodometrically.
4. Determination of Ferrous Ammonium Sulphate.
5. Determination of Sodium Hydroxide and Sodium Carbonate in a alkali mixture.

**(ii) GRAVIMETRIC ANALYSIS**

6. Determination of Barium as Barium Sulphate.
7. Determination of Silver as Silver Chloride.

**(iii) PHYSICO CHEMICAL ANALYSIS**

8. Determination of Viscosity of lubricating oil by Redwood Viscometer.
9. Determination of Flash & Fire Point of lubricating oil by Pensky – Martin apparatus.
10. Determination of Cloud and Pour Point of lubricating oil.
11. Determination of Calorific Value of a solid fuel by Bomb Calorimeter.
12. Determination of proximate analysis of Coal.

**(iv) PHYSICO CHEMICAL INSTRUMENTAL ANALYSIS / CHARACTERIZATION**

13. Spectrophotometer (UV – Vis) analysis / characterization.
14. Determination of pH by pH meter.
15. Determination of Conductivity of aqueous solutions of salts.
16. Determination of Sodium and Potassium by flame photometer.

**BE 107-COMPUTER PROGRAMMING LAB****((L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments**

1. Simple input output program integer, real character and string. (Formatted & Unformatted)
2. Conditional statement programs (if, if-else-if, switch-case)
3. Looping Program. (for, while, do-while)
4. Program based on array (one, two and three dimensions)
5. Program using Structure and Union.
6. Program using Function (with and without recursion)
7. Simple programs using pointers.
8. File handling.

**BE 108-PRACTICAL GEOMETRY****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments**

1.

- Lines, Lettering and Dimensioning
- Scales: Representative factor, plain scales, diagonal scales, scale of chords
- Conic Sections: Construction of ellipse, parabola and hyperbola by different methods. Normal and Tangents
- Special Curves: Cycloid, Epicycloids, Hypo-cycloid, Involute, Archimedean and logarithmic spirals

2.

- Projections: Types of projection, Orthographic projection, First angle and third angle projection
- Projection of points and lines, True inclinations and true length of straight lines, Traces of straight lines, Auxiliary planes

3.

- Projection of planes and solids: Projection of planes, Projection of polyhedra, Pyramids, Cylinder and Cone

4.

- Sections of Solids: Section of right solids by normal and inclined planes
- Development of Surfaces: Parallel line and radial line method for right solids

5.

- Isometric Projections: Isometric Scale, Isometric axes, Isometric projections of planes and simple solids, Introduction to development of surface.

**BE 109-WORKSHOP PRACTICE****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments****1.Carpentry Shop**

- . Timber, definition, engineering applications, seasoning and preservation
- . Plywood and ply boards , simple joints

**2.Foundry Shop**

- . Moulding Sands, constituents and characteristics
- . Pattern, definition, materials types, core prints
- . Role of gate, runner, riser, core and chaplets
- . Causes and remedies of some common casting defects like blow holes, cavities, Inclusions etc., module practice.

**3.Welding Shop**

- . Definition of welding, brazing and soldering processes and their applications
- . Oxyacetylene gas welding process, equipment and techniques, types of flames and their applications
- . Manual metal arc welding technique and equipment, AC and DC welding
- . Electrodes: Constituents and functions of electrode coating, welding positions
- . Types of welded joints, common welding defects such as cracks, undercutting, slag inclusion and boring etc., simple welding exercises

**4.Fitting Shop**

- . Files and other common tools materials and classification, fitting exercises.

**5.Smithy Shop**

- . Forging, forging principle, materials
- . Operations like drawing, upsetting, bending and forge welding
- . Use of forged parts

**List of jobs to be made in the workshop practice****S. No. List of Experiments****CARPENTRY SHOP**

1. T – Lap joint
2. Bridle joint

**FOUNDRY SHOP**

3. Mould of any pattern
4. Casting of any simple pattern

**WELDING SHOP**

5. Gas welding practice by students on mild steel flat
6. Lap joint by gas welding
7. MMA welding practice by students
8. Square butt joint by MMA welding
9. Lap joint by MMA welding
10. Demonstration of brazing

**MACHINE SHOP PRACTICE**

11. Job on lathe with one step turning and chamfering operations
12. Job on shaper for finishing two sides of a job
13. Drilling two holes of size 5 and 12 mm diameter on job used / to be used for shaping
14. Grinding a corner of above job on bench grinder

**FITTING AND SMITHY SHOP**

15. Finishing of two sides of a square piece by filing
16. Tin smithy for making mechanical joint and soldering of joint
17. To cut a square notch using hacksaw and to drill three holes on PCD and tapping

**BE 110-ELECTRICAL AND ELECTRONICS LAB****(L: 0: T: 0: P: 2)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments****A. ELECTRICAL LAB**

1.Single line diagram of a power system and a distribution sub-station and basic functional study of main components used in power systems.

2.Make house wiring including earthing for 1-phase energy meter, MCB, ceiling fan, tube light, three pin socket and a lamp operated from two different positions. Basic functional study of components used in house wiring.

3.Study the construction and basic working of ceiling fan, single phase induction motor and three phase squirrel cage induction motor. Connect ceiling fan along with regulator and single phase induction motor through auto-transformer to run and vary speed.

4.(a) Basic functional study and connection of moving coil & moving iron ammeters and voltmeters, dynamometer, wattmeter and energy meter.

(b) Run a 3-phase squirrel cage induction motor at no load and measure its voltage, current, power and power factor. Reverse the direction of rotation.

5.Study the construction, circuit, working and application of the following lamps:

(i) Fluorescent lamp, (ii) Sodium vapour lamp, (iii) Mercury vapour lamp, (iv) Halogen lamp and (v) Neon lamp

6.(a) Study the construction and connection of single phase transformer and auto-transformer. Measure input and output voltage and find turn ratio.

(b) Study the construction of a core type three phase transformer. Perform star and delta connection on a 3-phase transformer and find relation between line and phase voltage.

**B. ELECTRONICS LAB**

7.Identification, testing and applications of resistors, inductors, capacitors, PN-diode, Zener diode, LED, LCD, BJT, FET, UJT, SCR, Photo diode and Photo transistor.

8.(a) Functional study of CRO, analog & digital multi-meters and function / signal generator.

(b) Study the single phase half wave and bridge rectifier and effects of filters on waveform.

9.Study the BJT amplifier in common emitter configuration. Measure voltage gain, plot gain frequency response and calculate its bandwidth.

10.(a) Study the construction and basic working of SCR.

(b) Study the single phase half wave and bridge controlled rectifier and observe the effect of firing angle on waveform.

**BE 201-COMMUNICATION TECHNIQUES****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****Grammar** : Words and Sentences, Verbs / Tenses, Questions / Questions Tags, Modal Verbs, The Passive**UNIT - II****Grammar** : The Infinitive and The ING form, Nouns and Articles, Determiners, Reported Speech, Adjectives and Adverbs**UNIT - III****Grammar** : Prepositions, verbs with Prepositions and Adverbs Pronouns, Relative Clauses, Conditionals, Linking Words**UNIT - IV****Compositions** : Essay and Report Writing, Review Writing**UNIT - V****Compositions** : Applications, Letter and Précis Writing, Technical Proposal Writing

**BE 202-ENGINEERING MATHEMATICS – II****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I**

**Coordinate Geometry of Three Dimensions** - Equation of a sphere, Intersection of a sphere and a plane, tangent plane, normal lines, Right circular cone, Right circular cylinder

**UNIT - II**

**Matrices** - Rank of a matrix, inverse of a matrix by elementary transformations  
Solution of simultaneous linear equations, Eigen values and Eigen vectors, Cayley – Hamilton theorem (without proof), Diagonalization of matrix

**UNIT - III**

**Vector Calculus** - Scalar and vector field, differentiation & integration of vector functions  
Gradient, Divergence, Curl and Differential Operator, Line, Surface and volume Integrals  
Green's Theorem in a Plane, Gauss' and Stoke's Theorem (without proof) and their Applications

**UNIT - IV**

**Dynamics** - Angular Motion, Radial and Transverse Velocities and Accelerations  
Tangential and Normal Accelerations, Rectilinear Motion in Resisting Medium

**UNIT - V**

**Differential Equations** - Series Solutions of Second Order Linear Differential Equations with Variable Coefficients (Complementary Functions only), Partial Differential Equations of First Order, Lagrange's Form, Standard Forms, Charpit's Method

**BE 204-ENGINEERING MECHANICS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I**

- . System of forces, Fundamental laws of mechanics, Composition of forces, Free body diagram, Lami's theorem, Moments and couple, Varignon's theorem, condition of equilibrium
- . Types of support and loading, reaction, Analysis of simple trusses by methods of joints and method of sections

**UNIT - II**

- . Laws of Coulomb friction, Ladder, Wedges, Belt friction and rolling, Principle of virtual work and its applications

**UNIT - III**

- . Location of centroid and center of gravity, area moment of inertia, mass moment of inertia,
- . Law of machines, Variation of mechanical advantages, efficiency, reversibility of Machine, Pulleys, wheel and axle, wheel and differential axle, Transmission of power through belt and rope

**UNIT - IV****Kinematics of Particle**

- . Rectilinear motion, plane curvilinear motion, Projectile motion, Constrained motion of connected particles

**Dynamics of Particle and Rigid Body**

- . Newton's law of motion, D'Alembert's principle

**UNIT - V****Work and Energy** - Work, energy (Potential, Kinetic and Spring), Work – Energy relation

- . Law of conservation of energy

**Impulse and Momentum** - Impulse, momentum, Impulse – Momentum relation, Impact**Vibration** - Un-damped free vibrations

**BE 205-MECHANICAL ENGINEERING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT - I****Basic Concepts**

- Thermodynamic systems, properties, work and heat

**Working Fluids**

- Air and steam, calculation of properties of air as ideal gas for various thermodynamic processes
- Use of steam tables and Molier charts for steam properties

**First and Second Laws of Thermodynamics**

- Non-flow and flow energy equations, second law statements, Carnot cycle
- Application of first and second law to ideal gas system subjects to various thermodynamics processes

**UNIT - II****Internal Combustion Engines**

- Otto and Diesel cycle, thermal efficiency calculations , Classification, two and four stroke engines, construction and working of petrol and diesel , Engines.
- Introduction to various systems of IC engines

**Gas Turbine Plants**

- Ideal Bryton cycle, thermal efficiency calculations ,Construction and working of reciprocating and rotary air compressors,
- Applications of gas turbine plants

**UNIT - III****Steam Power Plant**

- Simple Rankine cycle, thermal efficiency calculations, classification of steam generators
- Construction and working of low and high pressure boilers,Introduction to various components of thermal power plants

**Refrigeration and Air-conditioning**

- Psychrometing, use of psychrometric charts,Elementary concepts of refrigeration and air-conditioning, Vapour compression cycle, working principle and schematic diagrams of refrigerators, air coolers, air conditioners and ice plants

**UNIT - IV****Manufacturing Processes**

- Classification, principle of working, specification, applications of various machine tools, lathe, drilling, shaper and milling machines, Basic descriptions and applications of hot and cold working processes, forging, bending, shearing, drawing and forming operations

**UNIT - V**

- Foundry Tools, equipments and moulding materials ,Gas welding, arc welding, soldering and brazing

**Power Transmission**

- Classification and application of mechanical drives like belts ropes, chains and gear, drives (excluding epicyclic trains) and their velocity ratios, Ratio of tension in belts and ropes

**BE 206-ENVIRONMENTAL STUDIES & DISASTER MANAGEMENT**  
**(L: 3: T: 1)** **Max.Marks:100**  
**Min.Marks:40**

**UNIT - I**

- Do's and Don'ts for prevention of life and property due to earthquake, tsunami, cyclone fire, flood and landslides,Legislative responsibility and community base disaster management

**UNIT - II**

- Introduction,General introduction to environment, biotic and abiotic environment
- Environmental pollution, Adverse effect of pollution n environment, control strategies
- Various acts and regulations for environmental protection

**UNIT - III****Water Pollution**

- Surface and underground sources of water,Water quality standards, impurities in water and their removal,River water pollution, eutrophication of lakes
- Domestic waste water management,

**Air Pollution**

- Sources of air pollution, adverse effects on human health,Green house effect, global warming, acid rain, ozone depletion

**Ecology**

- Basics of species, biodiversity, population dynamics,Energy flow, ecosystems, environmental impact assessment,Renewable sources of energy, Sustainable development

**UNIT - IV****Introduction & Basic Concept of Disasters**

- Types of disasters and their brief introduction: Natural & Man made disasters , Earthquakes, tsunami, cyclone, flood, drought, landslide,Nuclear, Chemical, Fire and environmental hazards

**UNIT - V****Disaster Management Cycle & its Components**

- Mitigation and prevention, preparedness,Response (rescue & relief), rehabilitation and recovery
- Disaster vulnerability & risk and its reduction,Maps showing earthquake, cyclone, flood and landslide hazards in India

**BE 207-LANGUAGE LAB****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50**

The content and coverage of the Language Lab. lessons will cover the following:

1. Phonetic symbols and transcription
2. Listening Skills and comprehension
3. Conversation practice, perfecting English sounds, pronunciation, stress and intonation etc.
4. Vocabulary building, synonyms and antonyms, one word for many, words commonly misspelt and mispronounced
5. Practice of Seminar presentation, Group discussion and Interview skills.

**BE 209-ENVIRONMENTAL ENGINEERING LAB****(L: 0: T: 0: P: 2)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments**

1. Measurement of pH of water
2. Measurement of hardness of water
3. Measurement of residual chlorine in water
4. Measurement of conductivity of water
5. Measurement of chlorides in water
6. Measurement of nitrate in water
7. Measurement of fluoride in water
8. Measurement of dissolved oxygen in water
9. Measurement of total solids in sewage
10. Measurement of dissolved solids in sewage
11. Measurement of settleable solids in sewage

**BE 210-MACHINE DRAWING****(L: 0: T: 0: P: 3)****Max.Marks:100****Min.Marks:50****S. No. List of Experiments**

1.
  - . Introduction to machine drawing
  - . Dimensioning, locations and placing,
  - . Orthographic projections: First & third angle methods
2. Sheet 1: Orthographic Projections (3 Problems)
3. Sheet 2: Sectional Views (3 Problems)
4. Sheet 3: Riveted joints, lap joints, butt joints, chain riveting, zig-zag riveting
5. Sheet 4: Screw fasteners, different threads, Nuts & bolts locking devices, set screws, foundation
6. Sheet 5: Bearing, Plumber block
7. Lectures on free hand sketches
8. List of free hand sketches
  - . Different type of lines
  - . Conventional representation of materials
  - . Screw fasteners
  - . Bearing: Ball, roller, needle, foot step bearing
  - . Coupling: Protected type, flange, and pin type flexible coupling
  - . Welded joints
  - . Belts and pulleys
  - . Pipes and pipe joints
  - . Valves

**BE III SEMESTER****CSE301: ENGINEERING MATHEMATICS III****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit I**

Laplace transform , Inverse Laplace transform , Convolution theorem , Existence theorem , Application to solutions of ordinary and simultaneous differential equation , Infinite Fourier transform , Various theorems and application to solution of first order partial differential equation.

**Unit II**

Solution of Bessel and Legendre's differential equation , Bessel function and Legendre polynomial of first kind , Generating function and recurrence relation of Bessel's and Legendre's functions , Orthogonality , Rodrigue's formula .

**Unit III**

Solution of Hyper geometric differential equation, Gauss Hyper geometric function and its integral representation, Gauss summation theorem and their transformations.

**Unit IV**

Numerical methods: Newton Gregory formula , Langrange's method , Gauss backward , Gauss forward , Striling's method for interpolation , Newton Gregory , Striling methods for numerical differentiation , Trapezoidal and Simpson's 1/3 and 3/8 rule for numerical integration.

**Unit V**

Numerical solution of ordinary differential equation of first and second order by Euler , Taylor , Milne's Runga-Kutta methods , Bijection , Regula-Falsi , Secant , Newton-Raphson Methods for Solution of algebraic and Transcendental equations , Matrix representation of simultaneous equations , Gauss Elimination , Jordan Jacobi , Gauss-Seidal methods for simultaneous linear algebraic equations.

## Text/References:

1. M.Ray, J.C.Chaturvedi & H.C.Sharma-Differential Equations.
2. Chandrika prasad-Mathematics for Engineers.
3. Chandrika prasad-Advanced Mathematics for engineers.
4. B.S.Grewal-Higher engineering mathematics
5. Gokhroo et al; Higher Engg.Maths III (3EE2) Unique Books, Ajmer

**CSE302: DIGITAL ELECTRONICS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT-I**

Introduction to number system, concept of logic gates, Boolean algebra and simplification of Boolean expression, K-map, Tabular method

**UNIT-II**

Combinational circuits, half adder, full adder, flip flops, transfer circuits, clocks, shift registers and binary and BCD counters, Multiplexer, Demultiplexer, Encoder, Decoder.

**UNIT-III**

Analysis and design of synchronous sequential systems, finite memory and flow chart method of design, State assignment, races and hazards, Introduction to threshold logic & relay circuits Sequential adder.

**UNIT-IV**

Introduction to switching devices, positive and negative logic OR AND,NOR ,NAND, Exclusive OR and Exclusive NOR gates, RTL,DCL,DCTL,TTL

**UNIT-V**

RCTL, ECL, HTL, MOS, and CMOS logic circuit and their realization, Fan- in and Fan-out capacity. Speed and delay in logic circuit.

Text/References:

1. Malvino and Leach-Digital principles and Applications.
2. M.Morris Mano-Digital Logic and computer Design.
3. S.Salivahnan, S.Anvazhagar-Digital circuits and design
4. T.C Bartee- Digital Computer

**CSE303: ELECTRONIC CIRCUITS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT-I**

Introduction; Biasing and Stabilization techniques of BJT, JFET, and MOSFET for use as amplifiers in various configurations, Small signal models for BJT, JFET, and MOSFET both in discrete and integrated form, Frequency dependence characterization.

**UNIT-II**

Introduction to Amplifiers; Single stage and multi stage, RC coupled amplifier, Frequency response Bandwidth gain and factors affecting them, Cascade and Darlington circuits, Follower circuits and bootstrapping, Feed back Amplifiers, Feed back concepts, typical current, Voltage-series Shunt and combination feed back circuits Study of the effects of feed back Amplifier.

**UNIT-III**

Wave shaping Circuits; Integrator and differentiating circuit's effect of time constant, relation of tilt time to time constants. Clipper and Clamper circuits using diodes and transistor, saturated and non -saturated transistor switches, speed up capacitors, Inverter Circuits.

**UNIT-VI**

Relaxation oscillator: Theory, Operation and performance of astable, monostable and bistable, multivibrator, different triggering circuits. Theory of Schmitt trigger.

**UNIT-V**

Operational Amplifiers: Characteristic of different amplifiers a analog computing element application as adder, subtractor, differentiator, integrator, exponential an log amplifiers, Regulated Power Supplies: Regulator circuits using solid state devices and monolithic ICs .Adjustable constant voltage power supplies. Adjustable constant current power supplies, Concept of SMPS and UPS.

Text/References:

1. J.Millman & C.C.Halkias-Integrated Electronics:analog & Digital circuits system, TMH
2. Jacob Millman and Arvin Grabel-Microelectronics, McGraw Hill
3. Robert L.Boyle sted & Louis Nashelshky-Devices and Circuit Theory, PHI
4. Millman and Taus- Pulse digital and switching waveforms

**CSE304: DISCRETE STRUCTURES****(L: 3: T: 1)****Max.Marks:100  
Min.Marks:40****UNIT-I**

Introduction to Discrete mathematical Structures, Formal Methods: Introduction and Analogy, Abstraction, Introduction to mathematical logic, statements and notations, well formed formulas, tautologies, tautological implications, normal forms.

**UNIT-II**

The theory of Inference for statement calculus, predicate logic, Sets, sequences, empty set, power set, operations on sets, Venn diagram, ordered pair, principle of inclusion and exclusion.

**UNIT-III**

Relations, matrix and graph representation of relation, properties of relations, partitions, Equivalence Relations, Compatibility Relations, Composition of Binary relations, Transitive and symmetric closures, partially ordered set, lattices.

**UNIT-IV**

Functions, matrix representation of functions, composition of function, inverse function, Algebraic Structure, General properties of algebraic systems, grupoids, semigroup, monoids, group, rings.

**UNIT-V**

Applications of algebra to control structure of a program, Homomorphism, congruences, admissible partions, group and their graphs.

## Text/References

1. K.R. Chowdhary- Fundamental Discrete Mathematical Structure, PHI
2. Kolman b, Busby R. : Discrete Mathematical Structure for Computer Science, PHI.
3. Liu :Introduction to Discrete Mathematics, McGraw Hill
4. Liu :Introduction to Combinatorics, McGraw Hill
5. Deo : Graph Theory, PHI

**CSE305: OBJECT ORIENTED PROGRAMMING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT-I**

A view of C: Concepts of object oriented programming using C++, Data types; elementary and derived data types, literals, Operational and expression: Operators, association and precedence rules of operators, Expression using unary, binary and ternary operators.

**UNIT-II**

Statements; declaration as statement, selection statements iteration statements, go to statement, break statement, break statement, continue statement return statement, try-catch block, Function: Void function, function with return value, Call by value and Call by reference parameter passing, default parameters, recursive function, inline functions.

**UNIT-III**

Classes: Classes, object, friend function, class with a class, Local classes, global classes, constructor, destructors, Derived classes: Single and multiple derivations of classes, Multilevel and hybrid derivation of classes, constructor and destructors.

**UNIT-IV**

Polymorphism; function an operator overloading, virtual function. Stream; input and output of built-in data types, manipulators, File stream: opening a file, accessing a file, closing a file.

**UNIT-V**

Exceptions: Catching exception, throwing the exception, standard exceptions, Templates: defining a template, template instantiation, function templates, class templates, Elementary case study of an object oriented database in c++.

## Text/References

1. Timothy Wood, An Introduction to Object Oriented Programming, Addison Wesley.
2. R. Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004.
3. Schildt Herbert, "C++: The Complete Reference", 4th Ed., Tata McGraw Hill, 1999.
4. Tony Gaddis, Watters, Muganda, "Object-Oriented Programming in C++", 3rd Ed.,
5. A.R.Venugopal, Rajkumar, T. Ravishanker "Mastering C++", TMH, 1997.

**CSE306: DATA STRUCTURES****(L: 3: T: 1)****Max.Marks:100  
Min.Marks:40****UNIT-I**

Introduction to Data Structure, String storage representation and manipulation, Marcov algorithm and primitive data structure, Concept of non primitive data structure

**UNIT-II**

Linear data structure, Array, stack, queue, their applications and implementation using sequential storage representation and linked representation.

**UNIT-III**

Linear link list, doubly linked list, circular linear linked list and generalized list and applications, Concept of non- linear data structure, Tree, Graph and their representation

**UNIT-IV**

Binary Tree, Threaded tree, different techniques of tree traversal, breadth first search, depth first search, application of tree and graph such that Polish notation, concepts of heap.

**UNIT-V**

Sorting, searching algorithms and comparative study of different sorting and searching techniques such that selection sort, heap sort, bubble sort, quick sort, merge sort and radix-sort Linear search and binary search, hashing, External sorting.

## Text/References

1. Aho A.V.,J.E.Hopcroft. J.D.Ulman :Data Structures and Algorithms,Addison Wesley.
2. Brastrad :Algorithms, PHI.
3. Horowitz and Sawhni :Algorithms Design and Analysis,CS Press.
4. Kruse R.L. :Data structure and Program Design.PHI.
5. Horwitz and Sawhni :Data structures in PASCAL, BPB.
6. Tanenbaum : Data structures in C,PHI
7. Trembley & Sorenson :An Introduction to Data Structures, Mc-Graw Hill International
8. Baase :Computer Algorithms, Pearson Education.

**CSE307: DIGITAL ELECTRONICS LAB****(L: 0: T: 0: P=2)****Max.Marks:100****Min.Marks:50**

1. Experimental study of characteristics of CMOS integrated circuits.
2. Interfacing of CMOS to TTL and CMOS.
3. Study of various combinatorial circuits based on: AND/NAND Logic blocks and OR/NOR Logic blocks.
4. Study of following combinatorial circuits: Multiplexer; demultiplexer and Encoder. Verify truth tables of various logic functions.
5. To study various waveforms at different points of transistor bistable multivibrator and its frequency variation with different parameters.
6. To study transistor astable multivibrator.
7. To design a frequency driver using IC-555/timer.
8. To study Schmitt trigger circuit.
9. To study OP-AMP as Current to voltage and voltage to current converter comparator.
10. BCD to binary conversion on digital/IC trainer.
11. Study various Flip flips and construct Parallel-in-Serial out register. Testing of digital IC by automatic digital IC trainer.

**CSE308: ELECTRONICS CIRCUITS LAB****(L: 0: T: 0: P=2)****Max.Marks:100****Min.Marks:50**

1. Study the following devices :
  - (a) Analog & digital multimeters
  - (b) Function/Signal generators
  - (c) Regulated D.C. power supplies (constant, voltage and constant current operations).
2. Study of analog CRO, measurement of time period, amplitude, frequency and phase angle using Lissajous figures.
3. Application of diode as clipper and clamper.

4. Plot V-I characteristic of zener diode & study zener diode as voltage, reverse Saturation current and static & dynamic resistances.
5. Plot V-I characteristic of zener diode & study zener diode as voltage regulator. Observe the effect of load changes and determine load limits of the voltage regulator.
6. Plot frequency response curve for audio amplifier and to determine gain bandwidth product.
7. Plot drain current-drain voltage and drain current-gate bias characteristics of field effect transistor and measurement of I & V<sub>p</sub>.
8. Plot gain :frequency characteristic of two stage RC coupled amplifier and calculate its bandwidth and compare it with theoretical value.
9. Plot gain :frequency characteristic of two stage RC coupled amplifier and calculate its bandwidth and compare it with theoretical value.
10. Plot input and output characteristics of BJT in CB, CC and CE configurations. Find their h-parameters.
11. Study half wave rectifier and effect of filter network on D.C. voltage output and ripple factor.
12. Study bridge rectifier and measure the effect of filter network on D.C. voltage output and ripple factor.

### **CSE309: OBJECT ORIENTED PROGRAMMING LAB**

**(L: 0: T: 0: P=2)**

**Max.Marks:100**

**Min.Marks:50**

#### **C++ Programs**

1. Programs inheritance.
2. Programs of operator overloading (complex number arithmetic, polar coordinates).
3. Programs using friend functions.
4. Various matrices operation.
5. Stack operations using OOPs concepts.
6. To implement Tower of Hanoi problem.

#### **JAVA Programs:-**

7. To implement spell checker using dictionary.
8. To implement color selector from a given set of colors.
9. To implement shape selector from a given set of shapes.
10. To implement a calculator with its functionality.
11. To show movement of a car.

### **CSE310: Data Structure Lab**

**(L: 0: T: 0: P=2)**

**Max.Marks:75**

**Min.Marks:38**

1. Program on array searching, sorting (Bubble sort, Quick sort, Merge sort etc.)
2. Program to insert element at desire position, replacing element, deletion in array.
3. Various matrices operations.
4. Various strings programs.
5. Implementation of stack and queue using array
6. Implementation of stack and queue using link lists
7. Implementation of circular queue using link lists.
8. Polynomial addition, multiplication.

9. Two-way link lists programs.
10. Infix to postfix/prefix conversion.
11. BST implementation (addition, deletion, searching).
12. Graph traversal (BFS, DFS).

## **CSE 311: Computer Applications Lab**

**(L: 0: T: 0: P=2)**

**Max.Marks:75**  
**Min.Marks:38**

Practice of common applications packages given below: -

1. Working with M.S Windows XP/ VISTA.
2. MS- Office
3. MS- Excel
4. MS- Access
5. MS- Power Point
6. Browser : Internet Explorer , Mozilla
7. Basic Idea of HTML, Websites, Search Engines.
8. E-mail, Free E-mail, Sending and reading image.

**BE300\*SPECIAL MATHEMATICS**

(For Diploma passed candidates-Common for all branches)

**(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit1****Differential Calculus:**

Introduction to successive differentiation, maxima and minima Partial Differentiation, Asymptotes, Curvature, envelopes, evolutes, concavity /convexity, singular points, curve tracing.

**Unit 2**

**Integral Calculus:** methods of integration, Definite Integral, Rectification and quadrature, Volumes and surfaces of solids of revolution. Mean values of functions, differentiation under sign of integration, Beta and Gamma functions

**Unit3**

**Differential Equations:** Differential equations of first order and first degree, Equation of the first order but not of the first degree, linear differential equation with constant coefficients, Homogeneous Linear differential equations, second order differential equation with variable coefficients

**Unit4**

**Matrix algebra:** Elementary transformations with application to inverse, Rank and Solution of simultaneous linear equations. Eigen values and Eigen vector, Cayley-Hamilton Theorem and its applications .

**Unit 5****Mechanics:**

Statics: Equilibrium of coplanar forces acting at a point, Resultant and Equilibrium of coplanar forces acting on rigid body, friction, Common catenary.

Dynamics: Composition and resolution of velocities and acceleration .Relative velocity. Rectilinear Motion under constant acceleration. Vertical motion under gravity. Simple harmonic motion.

**BE IV SEMESTER****CSE401: COMMUNICATION ENGINEERING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****UNIT-I**

Introduction to Analog and Digital techniques for electrical communication, concept of base band and carrier transmission, Elementary study of AM, DSBSC SSB, FM and PM.

**UNIT-II**

Sampling theorem and principle pulse analog modulation .Elements of PCM, fundamental of Digital carrier modulation, Elements of PCM, Fundamental of Digital carrier, modulation technique for communication.

**UNIT-III**

Concept of FDM and TDM, Meaning of synchronous and asynchronous transmission, Principle of models, Effects of noise in communication systems.

**UNIT-IV**

General structure of telecommunication network, Simplex, Duplex and half-duplex lines, Concepts of centralized and common control switching in telephone networks.

**UNIT-V**

Qualitative study of Radio-Wave propagation .Introductory study of microwaves LOS tropospheric scatter, Satellite and Optical communication.

## Text/References

1. H.Taub & D.L. Schilling-"Principles of Communication Systems", Tata Mc-Graw Hill.
2. G.Kennedy-"Electronic Communication Systems:", John Wiley & Sons.
3. Simon Haykin-"communication Systems". John Wiley & Sons.
4. B.P. Lathi-"Communication Systems:", John Wiley.

5. Louch-Digital & analog Communication, Pearson Education.
6. Tomasi-Electronic Communication. Pearson Education.

## **CSE402: PRINCIPLES OF PROGRAMMING LANGUAGES**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

### **UNIT-I**

Importance of programming language, brief history, features of good programming language translators, Syntax, Semantics, Virtual computers. Binding and binding time, Elementary and structured data types, their specifications and implementation.

### **UNIT-II**

Type checking and type conversion, Vectors array, records, character string, and variable size data structure, sets, input and out put files, Evolution of the concept of data types, abstraction, encapsulation and information hiding, subprograms, type definition and abstract data types.

### **UNIT-III**

Implicit and Explicit sequence control, sequence control within expression and between statements. Subprogram sequences control, Recursive subprograms, Exception and exception handlers, Co routines and scheduled subprograms, Task and concurrency Exception.

### **UNIT-IV**

Names and referencing environments, Static, dynamics and block structure ,Local data and local referencing environments, Dynamics and Static scope of shared data, Block structure, Parameters and their transmission.

### **UNIT-V**

Task and shared data, Storage requirements for major run –Time Elements Program and system controlled storage management. Static ad stack-based storage management .Fixed size and variable-size heap storage management.

#### **Text/References:**

1. Ghezzi :Programming Language Concepts,Addison Wesley.
2. Kernighan,Ritchie :Programming in C
3. Stroustrup :Programming in C++
4. Pratt :Programming Languages

5. Ravi Shetty:Programming Languages

### **CSE403: COMPUTER ORGANISATION AND ARCHITECTURE**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

#### **UNIT-I**

Organization of computer system, Construction of ALU, integer representation, binary half and full adder, parallel full adder, Addition and subtraction in a Parallel arithmetic element, BCD adder.

#### **UNIT-II**

Binary multiplication, Booth's algorithm, Binary division, Logical operations, implementation of logical instructions, floating point number system and arithmetic operations on floating point numbers.

#### **UNIT-III**

Concept of control unit, execution of instructions, hardwired and micro programmed control unit, microinstructions, Horizontal and vertical format, Microprogramming, Wilkes control

#### **UNIT-IV**

Memory element, RAM, Static RAM, Dynamic RAM, dimension of memory access, ROM, PROM, EPROM, EEROM, Magnetic, CCD and cache memories, Hierarchy of memories, Associative memory, Interconnection of computer components, buses, bus formats and operations, isolated and memory-mapped input-output.

#### **UNIT-V**

Interfacing of keyboards and printers, Interrupts in IO systems, DMA, Data transfer, DMA interrupts, polling, masking, nested interrupts, Control of data transfer, handshaking, bus scheduling, standard bus interfaces, Introduction to printers, magnetic tapes, disks, floppy disks, optical disk

#### Text/References

1. J.P.Hayes -'Computer Architecture & organization', Mc-Graw Hill.
2. Heuring-Computer System Design and Architecture,Pearson Education.
3. M.MORRISMANNNO-'Computer System Architecture', Prentice Hall of India.
4. T.C.Bartee-Digital Computer Architecture, Tata Mc-Graw Hill.

5. Stallings-Computer Organization and Architecture,Pearson Education.

### **CSE404: DATA BASE AND FILE SYSTEMS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

#### **UNIT-I**

Introduction to database system: A historical perspective, File systems v/s DBMS, advantage of a DBMS. Data abstraction, models, instances and schemes, Data independency, Data definition and manipulation language, Database manager, administration and users, over all system structure.

#### **UNIT-II**

Entities and entity sets relationships and relationship sets, Attributes mapping, Key, E-R diagram and its conversion to tables. Design of an E-R database schema, Structure of relational Database, The relational algebra, The tuple and domain relational calculus modification of database and views.

#### **UNIT-III**

Query languages and query by examples, Security of database against misuse. Domain constraints, referential integrity, Functional dependencies, assertion and triggers, pitfall in relational database design. Normalization using functional, multi valued and join dependencies, Domain key normal form. Alternative approaches to database design.

#### **UNIT-IV**

Data Storage, Physical storage media, file organization, organization records in to blocks, Sequential file, mapping relational data to files, data dictionary storage, buffer management

#### **UNIT-V**

Basic concept of indexing and hashing, properties of indexes, index specification in SQL, B+ Tree and B-Tree index files, Hash base indexing, static hash function, and dynamic hash function.

#### Text/References

1. Raghu Rama Krishnan : Database Managment Systems ,2nd ed: Tata Mc-Graw Hill
2. Elmasri -Fundamentals of Data Base Systems ,pearson Educations.
3. Silverschatz Korth and Sudarshan -Database Systems Concepts, 4th ed. Tata Mc-Graw Hill.

4. Gordon C- Everest -Database Management Objectives Systems Functions and Administration. Tata Mc-Graw Hill.
5. Hopcroft & Ullman: Databases, Galgotia.
6. Korth: Database system TMH

### **CSE405: Engineering Management and Economics**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Forms of Business (Basic Concepts only): Proprietorship, partnership, joint stock companies, joint sectors and co-operative movements.

Principles and techniques of management: management function, theories of management and their application to Indian and International conditions. Responsibility, authority leadership, motivation, co-ordination and co-operation. Change agent. Importance of organisation charts and their application to Computer Industries.

**Unit 2:**

Financial Management: Objectives, functions and importance of financial management, Book-keeping, journals and ledgers, balance sheet, profit and loss accounts, fund flows and financial ratios, sources of finance and Financial Instructions, Interest and depreciation, Salvage value.

Cost Accountancy: Various types of costs, profit, volume ratio, Break even analysis and marginal costing.

**Unit 3:**

Marketing Management: Concept of marketing and its various components.

Stores and Purchase Management: Function of store and purchase management. Economic order quantity, Purchase procedure in Government, Public and Private undertakings. Floating of tenders. Contracts.

**Unit 4:**

Production Planning and Control: Basic concepts of Job, Batch and Mass production, Production efficiency, productivity. Site selection, Production planning, Inventory control. Routing, scheduling and follow up. Elements of time and motion study. Quality control and quality management.

**Unit 5:**

Basic concepts of managerial economics. Supply and demand, free competition, monopoly and oligopoly. Health of Indian Economics and factors affecting it.

Feasibility Reports: preparation of feasibility, techno-economic and project reports.

Government Organisations: Department of Electronics, NASSCOM, STPI, Free trade zones for Electronics and computer industries, ministry of IT and its role.

## Text/References

1. Banga & Sharma: Engineering Management and Economics.
2. J. S. Chandan: Management Concept and Strategies, Vikas Publishing House
3. E. Pal De Gramu : Engineering Economy.
4. L. M. Prasad: Principles and Practices of Management
5. O. P. Khana: Industrial Engineering & Management
6. Ahuja: Management
7. Pandey I. M.: Financial Management, Vikas Publishing
8. M. D. Agrawal & N. P. Agrawal: Financial Management, Ramesh Book Depo Jaipur
9. S. N. Chary: Production and Operations management, TMH
10. Koontz, Weihrich and Aryasri: Principle of Management, TMH
11. Kotler and Armstrong: Principle of Marketing Management. PHI
12. P. M. Mehta :Managerial Economics, Sultan Chand & Sons

**CSE406: System Software****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit I**

Overview: Comparison of machine language, assembly language and high level languages, External and internal representation of instructions and data. Data allocation structures, search structures and addressing modes. Activities and system software for program generation, translation and execution. Editors for source code and object code/executable code files.

**Unit II**

Assemblers: Assembly language specification. Machine dependent and independent features of assembler. Classification of assemblers. Pass structure of assemblers (problem and associated for IBM-PC).

**Unit III**

Loader and Linkers :Functions and classification. Machine dependent and independent features of loaders, Design of bootstrap, absolute and relocatable loaders, Design of linker. Case study of MS-DOS linker.

**Unit IV**

Macro processors: Macro definition, call and expansion. Macro processor algorithm and data structure. Machine independent features (parameters, unique labels, conditional expansion, nesting and recursion).Pass structure and design of microprocessor and macro assembler, Case study of MASM macro assembler.

**Unit V**

High level language processing and compilers: HLL specification; Grammars and parse trees, expression and precedence. Lexical analysis: Classification of tokens, scanning methods, character recognition, lexical ambiguity. Syntactic analysis: Operator precedence parsing, recursive descent parsing. Symbol Table Management: Data structure for symbol table, basing functions for symbols, overflow technique, block structure in symbol table.

## Text/References

1. D.M. Dhamdhare-System programming & operating system. Tata McGraw Hill.
2. L.L. Beck-System Software, Pearson Education
3. J.J. Donovan-System programming Tata McGraw Hill.

### **CSE407: COMMUNICATION ENGINEERING LAB**

**(L: 0: T: 0: P=2)**

**Max.Marks:100**

**Min.Marks:50**

1. Harmonic analysis of a square wave of modulated wave form
2. Observe the amplitude modulated waveform and measures modulation index . Demodulation of the AM signal
3. To modulate a high frequency carrier with sinusoidal signal to obtain FM signal .Demodulation of the FM signal
4. To observe the following in a transmission line demonstrator kit:
  - i. The propagation of pulse in non-reflecting Transmission line.
  - ii. The effect of losses in Transmission line.
  - iii. The recognizance characteristics of al half wave length long x-mission line.
5. To study and observe the operation of a super heterodyne receiver
6. To modulate a pulse carrier with sinusoidal signal to obtain PWM signal and demodulate it .
7. To modulate a pulse carrier with sinusoidal signal to obtain PPM signal and demodulate it.
8. To observe pulse amplitude modulated waveform and its demodulation.
9. To observe the operation of a PCM encoder and decoder .To consider reason for using digital signal xmissions of analog signals.
10. Produce ASK signals, with and without carrier suppression, Examine the different processes required for demodulation in the two cases.
11. To observe the FSK wave forms and demodulate the FSK signals based on the properties of (a) tuned circuits  
(b) on PLL.

### **CSE:408 PROGRAMMING LABORATORY**

**(L: 0: T: 0: P=2)**

**Max.Marks:75**

**Min.Marks:38**

**UNIX**

1. Use of advanced vi commands.
2. Sorting of files containing records using sort command.
3. Searching patterns in files.
4. Use of bc, expr, factor commands.
5. Use of head, tail, compress commands.
6. Memory management commands, dfspace, du, ulimit etc.

**JAVA**

7. Programs based on matrix: addition, multiplication, transpose, check if matrix is symmetric / upper triangular / lower triangular / unit matrix.
8. Representation of complex numbers and their operation: add, multiply; divide, subtraction, magnitude (mod) etc.
9. Complex matrix representation and operation: add, subtract, multiply.
10. Defining packages for sorting algorithms.
11. File handling operations: input from file, output to file, file copy, file concatenation.
12. Mouse and keyboard event handling programs.
13. Programs based on string operations.
14. Drawing in applet and use of buttons check boxes, text fields and labels in applets.

**CSE409: COMPUTER ORGANIZING & ARCHITECTURE LAB.****(L: 0: T: 0: P=2)****Max.Marks:75****Min.Marks:38**

1. Designing and testing a Half adder.
2. Designing and testing a Full adder.
3. Designing and testing a 4 to 1 bit multiplexer.
4. Designing and testing a 1 to 1 bit Demultiplexer.
5. Studying a simulator for any of 8085 or PDP8 system.
6. Adding 5 integers on simulator.
7. Finding largest no. using simulator.
8. Complementing memory location using simulator.
9. Comparative study of 8085 and 6800 micro processor.
10. Study of any RISC based system.

**CSE410: DATABASE & FILE SYSTEM LAB****(L: 0: T: 0: P=2)****Max.Marks:100****Min.Marks:50**

**Each experiment is designed for two lab classes. Student can use any DBMS tool (MS Access/ORACLE/PLSQL/Foxpro) at backend and C++/VC++/JAVA at front end. Database connectivity tools ODBC/DAO/JDBC WILL BE USED.**

1-2 Design a system for Hotel Management System. System provides facility for room reservation (for different category rooms), and Catering service billing. Customer's order for various food items are recorded during his stay at Hotel and Complete Bill (Including Room Rent and Food consumed) is generated when customer checkouts.

3-4 Design a Computer Terminal Booking System for booking of 5 named computer terminals for 12-hour duration each day. User may book Terminals after entering their User ID and password and they can book a terminal for maximum 5 hour/day (in continuous slot or fragmented slots). Terminal booking chart is generated for each day for each terminal.

5-6 Design a Loan Approval and Repayment System to handle Customer's Application for Loan and handle loan repayments by depositing instalments and reducing balances.

7-8 Design a Video Library Management System for managing issue and return of Video tapes/CD's and manage customer's queries.

9-10 Design a Time Management System for an Office with 10-executives who record their daily appointments in the system. When Manager wants to conduct a meeting of Executives on a particular day System finds a free time slot to conduct the meeting.

11-12. Design an Outdoor-Management System for a Hospital where several experts sit in outdoor room and system registers patients and sends them to appropriate expert. Each Expert can handle a limited number of patients a day

### **CSE411: SYSTEM SOFTWARE LAB.**

**(L: 0: T: 0: P=2)**

**Max.Marks:100**

**Min.Marks:50**

1. Study of MASM Assembler.
2. Writing simple programs and practicing DEBUG Command.

Use MASM for following program (3-5):-

3. Adding five integers.
4. Finding largest of five integers.
5. Multiplying three integers.
6. Designing a simple one pass assembler using C/C++.
7. Studying of Macros in C/C++.
8. Writing program to convert infix notation to postfix notation.
9. Writing a program to compute any given postfix notation.
10. Writing a program to check syntax of any infix notation.

**CSE501: SOFTWARE ENGINEERING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

System Analysis: Characteristics, Problems in system Development, System Level project Planning, System Development Life cycle (SDLC), computer system engineering system analysis, modeling the architecture, system specification.

**Unit 2:**

Software Project Management: Objectives, Resources and their estimation, LOC and FP estimation, effort estimation, COCOMO estimation model, risk analysis, software project scheduling.  
Software Development : Life Cycle (SWDLC), SWDLC models software engineering approaches

**Unit 3:**

Requirement Analysis: Requirement analysis tasks, Analysis principles. Software prototyping and specification data dictionary finite state machine (FSM) models.  
Structured Analysis: Data and control flow diagrams, control and process specification behavioral modeling, extension for data intensive applications.

**Unit 4:**

Software Design: Design fundamentals, Effective modular design: Data architectural and procedural design, design documentation.

**Unit 5:**

Object Oriented Analysis: Object oriented Analysis Modeling, Data modeling.  
Object Oriented Design: OOD concepts and methods class and object definitions, refining operations. Class and object relationships, object modularization. Introduction to Unified Modeling Language

## Text/References

1. R. G. Pressman – Software Engineering, TMH
2. Behforooz, Software Engineering Fundamentals, OUP
3. Ghezzi, Software Engineering, PHI
4. Pankaj Jalote – An Integrated Approach to Software Engineering, NAROSA.
5. Object Oriented & Classical Software Engineering (Fifth Edition), SCHACH, TMH
6. Vans Vlet, Software Engineering, SPD
7. Uma, Essentials of Software Engineering, Jaico
8. Sommerville, Ian – Software Engineering, Pearson Education
9. Benmenachen, Software Quality, Vikas
10. IEEE Standards on Software Engineering.
11. Kane, Software Defect Prevention, SPD

**CSE502: MICROPROCESSOR AND INTERFACES****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to Micro Computer Systems: Microprocessors, microcontroller and microcomputer devices, Machine and assembly language, Bus concept. Architecture & Pinout of 8085A.

**Unit 2:**

Assembly Language and Programming in 8085: Instruction set, Program structures (sequential, conditional, iterative), Macros and subroutines, Stack, Counter and timing delay, interrupt structure and its programming.

**Unit 3:**

Peripherals and their interfacing with 8085-I: Memory Interfacing, Interfacing I/O ports, Data transfer schemes (Synchronous, asynchronous, interrupt driven), Architecture & interfacing of PPI 8255, Data Converters and Timer 8254.

**Unit 4:**

Peripherals and their interfacing with 8085-II: Architecture & interfacing of- DMA controller 8257, interrupt Controller 8259A, USART 8251, Level Converters MC 1488 and MC 1489, Current loop, RS 232 C and RS 422 A.

**Unit 5:**

Comparative study of 8085 A, 8086 and 8088 (Pinout, internal architecture, timing diagrams), Instruction format and addressing modes – Data and Branch related. Features of Pentium processor, MMX and Dual core processor.

## Text/References

1. Gaonkar-8085 Programming, Penram Press.

2. A.P. Mathur-Introduction to Microprocessors, Tata Mc-Graw-Hill.
3. Antanakos-Introduction to Intel Family Microprocessors, Pearson Education.
4. Gilmore-Microprocessors Principles and Applications, Tata Mc-Graw Hill.
5. B.Ram-Fundamentals of Microprocessors & Micro Computers, Dhanpat Rai Pub.
6. Ray and Bhurchandi-Intel Microprocessors, Tata-Mc-Graw Hill.

### **CSE503: E-COMMERCE**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Introduction: Motivation, Forces behind E-Commerce Industry Framework, Brief history of ECommerce, Inter Organizational E-Commerce Intra Organizational E-Commerce, and Consumer to Business Electronic Commerce, Architectural framework, Network Infrastructure for E-Commerce Network Infrastructure for E-Commerce, Market forces behind I Way, Component of I way Access Equipment, Global Information Distribution Network, Broad band Telecommunication.

**Unit 2:**

Mobile Commerce: Introduction to Mobile Commerce, Mobile Computing Application, Wireless Application Protocols, WAP Technology, Mobile Information Devices, Web Security, Introduction to Web security, Firewalls & Transaction Security, Client Server Network, Emerging Client Server Security Threats, firewalls & Network Security.

**Unit 3:**

Encryption: World Wide Web & Security, Encryption, Transaction security, Secret Key Encryption, Public Key Encryption, Virtual Private Network (VPM), Implementation Management Issues.

**Unit 4:**

Electronic Payments: Overview of Electronics payments, Digital Token based Electronics payment System, Smart Cards, Credit Card I Debit Card based EPS, Emerging financial Instruments, Home Banking, Online Banking.

**Unit 5:**

Net Commerce: EDA, EDI Application in Business, Legal requirement in E -Commerce, Introduction to supply Chain Management, CRM, issues in Customer Relationship Management.

Text/References

1. David Whiteley - E-Commerce Strategy, Technology and Application, Tata McGraw Hill.
2. Mathew Reynolds - Beginning E-commerce with Visual Basic ASP, SQL Server 7.0 and MTS, Shroff Publishers & Distributors Pvt. Ltd.
3. Perrone & Chaganti - Building Java Enterprises System with J2EE, Techmedia.
4. Kalakota - Frontiers of Electronic Commerce, Pearson Education.

### **CSE504: COMPUTER GRAPHICS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Introduction to Raster scan displays, Storage tube displays, refreshing, flicking, interlacing, color monitors, display processors resolution, working principle of dot matrix, inkjet laser printers, working principles of keyboard, mouse scanner, digitizing camera, track ball, tablets and joysticks, graphical input techniques, positioning techniques, rubber band techniques, dragging etc.

**Unit 2:**

Scan conversion techniques, image representation, line drawing, simple DDA, Bresenham's Algorithm, Circle drawing, general method, symmetric DDA, Bresenham's Algorithm, curves, parametric function, Bezier Method, B-sp- line Method.

**Unit 3:**

2D & 3D Co-ordinate system, Translation, Rotation, Scaling, Reflection Inverse transformation, Composite transformation, world coordinate system, screen coordinate system, parallel and perspective projection, Representation of 3D object on 2D screen.

**Unit 4:**

Point Clipping. Line Clipping Algorithms, Polygon Clipping algorithms, Introduction to Hidden Surface elimination, Basic illumination model, diffuse reflection, specular reflection, phong shading, Gourand shading ray tracing, color models like RGB, YIQ, CMY, HSV etc.

**Unit 5:**

Multimedia components, Multimedia Hardware, SCSI, IDE, MCI, Multimedia data and file formats, RTF, TIFF, MIDI, JPEG, DIB, MPEG, Multimedia Tools, Presentation tools, Authoring tools, presentation.

Text/References

1. Hearn, Baker – “ Computer Graphics ( C version 2nd Ed.)” – Pearson education

2. Z. Xiang, R. Plastock – “Schaum’s outlines Computer Graphics (2nd Ed.)” – TMH
3. D. F. Rogers, J. A. Adams – “Mathematical Elements for Computer Graphics (2nd Ed.)” – TMH
4. Mukherjee, Fundamentals of Computer graphics & Multimedia, PHI
5. Sanhker, Multimedia –A Practical Approach, Jaico
6. Buford J. K. – “Multimedia Systems” – Pearson Education
7. Andleigh & Thakrar, Multimedia, PHI
8. Mukherjee Arup, Introduction to Computer Graphics, Vikas
9. Hill, Computer Graphics using open GL, Pearson Education
10. Foley, Vandam, Feiner, Hughes – “Computer Graphics principles (2nd Ed.) – Pearson Education.
11. W. M. Newman, R. F. Sproull – “Principles of Interactive computer Graphics” – TMH.
12. Elsom Cook – “Principles of Interactive Multimedia” – McGraw Hill

### **CSE505: TELECOMMUNICATION FUNDAMENTALS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Electromagnetic Spectrum, Frequency Spectrum-Bandwidth-Allocation, Time domain and Frequency domain analysis, Transmission media, Twisted pair, UTP cables, Coaxial and optical fiber cables, wireless, microwave and satellite transmission, Transmission impairments. Serial and parallel transmission, Simplex, half duplex or full duplex transmission mode. Network, LAN, MAN, WAN, Internet, Intranet, Extranet, Network Topology, Protocols, Layered Architecture, OSI and TCP/P protocol Architecture.

**Unit 2:**

Physical Layer : Convention and terminology (bit rate, channel capacity, bandwidth, Signal strength, SNR)  
Physical transmission media interface(Mechanical, Electrical and Radio interface specification)  
Modulation (ASK, FSK and PSK, PCM, PAM, Delta Modulations), Line coding (NRZ-L, NRZ-I, Bipolar AMI, Manchester and differential Manchester), Multiplexing (FDM, Synchronous and Statistical TDM)  
Brief Introduction to Ethernet, SONET/SDH.

**Unit 3:**

Data Link Layer: Channel allocation problem, pure and slotted ALOHA Protocols, Persisted And Non-Persisted CSMA, Collision Free Protocols, Digital Cellular Radio and CDMA. Logical Link Sub Layer, MAC Sub layer. Brief Introduction: Frame Relay, PPP.

**Unit 4:**

Switching Networks: Circuit switching Networks, Space and Time division switching, Routing circuit switched networks, control signaling packet switching principles, fixed, flooding and adaptive routing strategies, Brief Introduction: Broadband and Narrowband ISDN, ADSL.

**Unit 5:**

Network Devices: Gateway, Router, Bridge, Switch, Hub, Repeater, Multilayer Switch, Protocol Converter, Router, Proxy, Firewall, Multiplexer, Network Card, Modem. Network Technology: DSL, GSM, Bluetooth, Infrared. Brief Introduction to Servers : File Server, Print Server, Mail Server, Proxy Server, Remote Access Server (RAS), Application Server, Web Server, Backup Server

## Text/References

1. William Stallings :Data and Computer Communications (PHI, 5th Ed.)
2. James Martin :Telecommunication and the Computer (PHI,3rd Ed.)
3. A.S. Tanenbaum :Computer Networks (PHI,3rd Ed.)

**CSE506.1: LOGICAL AND FUNCTIONAL PROGRAMMING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

PROPOSITIONS: Fully parenthesized propositions, Evaluation of constant propositions, Evaluation of proposition in a state. Precedence rules for operators, Tautologies, Propositions a sets of states and Transforming English to prepositional form.

**Unit 2:**

REASONING USING EQUIVALENCE TRANSFORMATIONS: The laws of equivalence, rules of substitution and transitivity, formal system of axioms and Inference rules. NATURAL DEDUCTION SYSTEM: Introduction to deductive proofs, Inference rules, proofs and sub-proofs, adding flexibility to the natural deduction system and developing natural deduction system proofs.

**Unit 3:**

PREDICATES: Extending the range of a state, Quantification, Free and Bound Identifiers, Textual substitution, Quantification over other ranges and some theorems about textual substitution and states.

**Unit 4:**

LOGIC PROGRAMMING: Introduction to prepositional and predicate calculus, First-order predicate calculus, Format logical systems, PROLOG programming-Facts, Rules and queries, Implementations, Applications, Strengths and Weaknesses.

**Unit 5:**

FUNCTIONAL PROGRAMMING: Introduction to lambda calculus-Syntax and semantics, Computability and correctness. Features of Functional Languages-Composition of functions, Functions as first-class Objects, no side effects and clean semantics, LISP Programming-Data types and structures, Scheme dialect, primitive functions, functions for constructing functions and functional forms. Applications of functional languages and comparison of functional and imperative languages.

## Text/References

1. Appleby-Programming Languages, Tata Mc-Graw Hill.
2. Sebesta-Concepts of Programming Languages, Pearson Education.
3. David Gries-The Science of programming, Narosa Publication House.

### **CSE506.2: INFORMATION THEORY & CODING**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Elements Of Information Theory: Measure of information, average information, entropy, information rate. Communication channel, discrete and continuous channel

**Unit 2:**

Shannon-Hartley theorem and its implications. Channel capacity, Gaussian channel and bandwidth-S/N tradeoff.

**Unit 3:**

Introduction of Coding: types of efforts, types of codes, error control coding, methods of controlling errors

**Unit 4:**

Linear Block and Binary Cyclic Codes: matrix decryption of linear block codes, error detection and error correction capabilities of linear block codes. Hamming codes, structure of cyclic codes, encoding using an (n-k) bit shift register syndrome calculation, its error detection & correction, special classes of cyclic codes etc.

**Unit 5:**

Burst and Convolution Codes: burst and random error correcting codes, encoders for convolution codes. Decoders for convolution codes

Text/References

1. K. Sam Shanmugam-"Digital and Analog Communication System", John Wiley Sons.
2. Herbor Taub Donald Schilling- "Principal of Comunication System". Tata Mc-Graw Hill.

**CSE506.3: ADVANCED DATA STRUCTURES****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

ADVANCED TREES: Definitions Operations on Weight Balanced Trees (Huffman Trees), 2-3 Trees and Red-Black Trees. Augmenting Red-Black Trees to Dynamic Order Statistics and Interval Tree Applications. Operations on Disjoint sets and its union-find problem Implementing Sets. Dictionaries, Priority Queues and Concatenable Queues using 2-3 Trees.

**Unit 2:**

MERGEABLE HEAPS: Mergeable Heap Operations, Binomial Trees Implementing Binomial Heaps and its Operations, 2-3-4. Trees and 2-3-4 Heaps. Amortization analysis and Potential Function of Fibonacci Heap Implementing Fibonacci Heap. SORTING NETWORK: Comparison network, zero-one principle, bitonic sorting and merging network sorter.

**Unit 3:**

GRAPH THEORY DEFINITIONS: Definitions of Isomorphic Components. Circuits, Fundamental Circuits, Cut-sets. Cut-Vertices Planer and Dual graphs, Spanning Trees, Kuratovski's two Graphs.

**Unit 4:**

GRAPH THEORY ALGORITHMS: Algorithms for Connectedness, Finding all Spanning Trees in a Weighted Graph and Planarity Testing, Breadth First and Depth First Search, Topological Sort, Strongly Connected Components and Articulation Point. Single Min-Cut Max-Flow theorem of Network Flows. Ford-Fulkerson Max Flow Algorithms

**Unit 5:**

NUMBER THEORITIC ALGORITHM: Number theoretic notation, Division theorem, GCD recursion, Modular arithmetic, Solving Linear equation, Chinese remainder theorem, power of an element, RSA public key Crypto system, primality Testing and Integer Factorization.

#### Text/References

1. Narsingh Deo-Graph Theory with Application to Engineering and Computer Science,Prentice Hall of India.
2. Baase-Computer Algorithms,pearson Education.
3. Cormen-Introduction to Algorithms,Prentice Hall of India.
4. Aho A.V.,Hopcrptt J.E. and Ullman J.D.-The Design and Analysis of Computer Algorithms, Pearson Education.
5. Horowitz and Sawhni-Fundamentals of Data Structures Galgotia Book Source.

### **CSE507: SOFTWARE ENGINEERING LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

In this lab first 8 experiments are to practice software engineering techniques. Use any open source CASE tool. Many of them are available at [www.sourceforge.net](http://www.sourceforge.net). You can choose any other CASE tool, as per choice.

Language : C++ / JAVA

Design Approach : Object Oriented

These designing can be done on any automation system e.g. library management system, billing system, payroll system, bus reservation system, gas agency management system, book-shop management system, students management system.

1. Do a feasibility study
2. Document all the requirements as specified by customer in Software Requirement Specification
3. Design sequence diagrams for project
4. Design Collaboration diagram
5. Design Data Flow Diagram for the project
6. Design Entity Relation Diagram for the project
7. Design Class diagram
8. Design at least 10 test cases for each module.
9. -10: Code and test the project, which you have designed in last 8 labs.

### **CSE508: MICROPROCESSORS LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

1. Study of hardware, functions, memory, and operations of 8085 kit.
2. Program to perform integer addition (two and three numbers 8 bit)
3. Program to perform multiplication (two 8 bit numbers).
4. Program to perform division (two 8 bit numbers).
5. Transfer of a block data in memory to another place in memory in forward and reverse order.

6. Swapping of two block data in memory.
7. Addition of 10 numbers using array.
8. Searching a number in an array.
9. Sorting of array (ascending, descending order).
10. Print Fibonacci sequence. (15 elements)
11. To insert a number at correct place in a sorted array.
12. Interfacing seven segment display using 8255.

### **CSE509: E-COMMERCE LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**

**Min.Marks:38**

1. Overview of Lab & Project.
  2. Basics of HTML, DHTML, ASP and ASP data Connectivity.
  3. Creation of the SQL server Database.
  4. Creation of the ODBC connectivity.
  5. Insertion/ modification of data with ASP.
  6. Selection of data using Record sets.
  7. Exercises using ASP/SQL
  8. Exercises using MS FrontPage.
- Mini Project in E-Commerce: Developing a small E-Commerce product catalog using ASP/MS SQL.

### **CSE510: COMPUTER GRAPHICS LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**

**Min.Marks:38**

1. Implementation of line generation using slope's method, DDA and Bresenham's algorithms.
2. Implementation of circle generation using Mid-point method and Bresenham's algorithm.
3. Implementation of ellipse generation using Mid-point method.
4. Implementation of polygon filling using Flood-fill, Boundary-fill and Scan-line algorithms.
5. Implementation of 2D transformation: Translation, Scaling, Rotation, Mirror Reflection and Shearing (write a menu driven program).
6. Implementation of Line Clipping using Cohen-Sutherland algorithm and Bisection Method.
7. Implementation of Polygon Clipping using Sutherland-Hodgman algorithm.
8. Implementation of 3D geometric transformations: Translation, Scaling and rotation.
9. Implementation of Curve generation using Interpolation methods.
10. Implementation of Curve generation using B-spline and Bezier curves.
11. Implementation of any one of Back face removal algorithms such as Depth-Buffer algorithm, Painter's algorithm, Warnock's algorithm, Scan-line algorithm)

**CSE601: OPERATING SYSTEMS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to Operating Systems, Operating system services, multiprogramming, time-sharing system, storage structures, system calls, multiprocessor system. Basic concepts of CPU scheduling, Scheduling criteria, Scheduling algorithms, algorithm evaluation, multiple processor scheduling, real time scheduling I/O devices organization, I/O devices organization, I/O devices organization, I/O buffering.

**Unit 2:**

Process concept, process scheduling, operations on processes, threads, inter-process communication, precedence graphs, critical section problem, semaphores, classical problems of synchronization. Deadlock problem, deadlock characterization, deadlock prevention, deadlock avoidance, deadlock detection, recovery from deadlock, Methods for deadlock handling.

**Unit 3:**

Concepts of memory management, logical and physical address space, swapping, contiguous and non-contiguous allocation, paging, segmentation, and paging combined with segmentation.

**Unit 4:**

Concepts of virtual memory, demand paging, page replacement algorithms, allocation of frames, thrashing, demand segmentation. Security threads protection intruders-Viruses-trusted system.

**Unit 5:**

Disk scheduling, file concepts, file access methods, allocation methods, directory systems, file protection, introduction to distributed systems and parallel processing case study.

Text/References

1. William Stallings, "Operating System-Internals and Design Principles ", 5/c, Prentice Hall India, ISBN-81-297-0 1 094-3
2. Silberschatz, Galvin, Gagnes , "Operating System Concepts" 6/e , John Wiley & Sons, ISBN-9971-51-388-9
3. Dhamdhre D. M., "Operating Systems - A Concept-Based Approach", Tata McGraw Hill Publications, 2nd Edition-2006
4. Andrew S. Tanenbaum, " Modern Operating Systems", 2/e, Prentice Hall India, ISBN 81-203-2063-8 .
5. Maurice J. Bach, "The design of the UNIX Operating System", Prentice Hall India, ISBN-81-203-0516- 7

### **CSE602: COMPUTER NETWORKS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Network, Network Protocols, Edge, Access Networks and Physical Media, Protocol Layers and their services models, Internet Backbones, NAP's and ISPs.

**Unit 2:**

Application Layer: Protocol and Service Provided by application layer, transport protocols. The world wide web. HTTP, Message formats, User Server Interaction and Web caches. FTP commands and replies. Electronic Mail, SMTP, Mail Message Formats and MIME and Mail Access Protocols DNS The internet's directory service DNS records and Message.

**Unit 3:**

Transport Layer: Transport Layer Service and Principles, Multiplexing and Demultiplexing applications, connectionless Transport. UDP Segment structure and UDP Checksum. Principles of Reliable Data Transfer-Go back to N and Selective Repeat. Connection Oriented Transport TCP Connection and Segment Structure, Sequence Numbers and acknowledgement numbers, Telnet, Round trip time and timeout. TCP connection management.

**Unit 4:**

Network Layer and Routing: Network service model, Routing principles. Link State routing Algorithm, A distant Vector routing & OSPF algorithm. Router Components; Input Prot, Switching fabric and output port. IPV6 Packet format. Point To Point Protocol (PPP), transition States, PPP Layers-Physical Layer and Data Link Layer, Link Control Protocols. LCP Packets and options. Authentication PAP and CHAP, Network Control Protocol (NCP).

**Unit 5:**

Sonet/SDH:Synchronous Transport Signals. Physical configuration-SONET Devices, Sections, Lines and Paths. SONET Layers-Photonic Layer, section layer, line layer, path layer and device layer

relationship. Sonet Frame format. Section overhead, Line overhead and path overhead. Virtual Tributaries and types of VTs.

#### Text/References

##### Text Books:

1. B. A. Forouzan – “Data Communications and Networking (3rd Ed.)” – TMH
2. A. S. Tanenbaum – “Computer Networks (4th Ed.)” – Pearson Education/PHI
3. W. Stallings – “Data and Computer Communications (5th Ed.)” – PHI/ Pearson Education
4. Zheng & Akhtar, Network for Computer Scientists & Engineers, OUP
5. Black, Data & Computer Communication, PHI
6. Miller, data Communication & Network, Vikas
7. Miller, Digital & Data Communication, Jaico
8. Shay, Understanding Data Communication & Network, Vikas
10. Kurose and Rose – “ Computer Networking -A top down approach featuring the internet” – Pearson Education
11. Leon, Garica, Widjaja – “Communication Networks” – TMH
12. Walrand – “Communication Networks” – TMH.
13. Comer – “Internetworking with TCP/IP, vol. 1, 2, 3(4th Ed.)” – Pearson Education/PHI

### **CSE603: DESIGN & ANALYSIS OF ALGORITHMS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

#### **Unit 1:**

BACKGROUND: Review of Algorithm Complexity and Order Notations and Sorting Methods.

DIVIDE AND CONQUER METHOD: Binary Search, Merge Sort, Quick sort and strassen's matrix multiplication algorithms.

GREEDY METHOD: Knapsack Problem, Job Sequencing, Optimal Merge Patterns and Minimal Spanning Trees.

#### **Unit 3:**

DYNAMIC PROGRAMMING: Matrix Chain Multiplication. Longest Common Subsequence and 0/1 Knapsack Problem.

BRANCH AND BOUND: Traveling Salesman Problem and Lower Bound Theory. Backtracking Algorithms and queens problem.

#### **Unit 3:**

PATTERN MATCHING ALGORITHMS: Naïve and Rabin Karp string matching algorithms, KMP Matcher and Boyer Moore Algorithms.

ASSIGNMENT PROBLEMS: Formulation of Assignment and Quadratic Assignment Problem.

#### **Unit 3:**

RANDOMIZED ALGORITHMS. Las Vegas algorithms, Monte Carlo algorithms, randomized algorithm for Min-Cut, randomized algorithm for 2-SAT.

Problem definition of Multicommodity flow, Flow shop scheduling and Network capacity assignment problems.

#### **Unit 3:**

PROBLEM CLASSES NP, NP-HARD AND NP-COMPLETE: Definitions of P, NP-Hard and NP-Complete Problems. Decision Problems. Cook's Theorem. Proving NP-Complete Problems - Satisfiability problem and Vertex Cover Problem. Approximation Algorithms for Vertex Cover and Set Cover Problem.

## Text/References

1. Bressard, "Fundamental of Algorithm." , PHI
2. Horowitz and Sahani, "Fundamentals of computer Algorithms", Galgotia.
3. Thomas H Connen and Charles E.L Leiserson, "Introduction to Algorithm" PHI
4. A. V. Aho and J.D. Ullman, "Design and Analysis of Algorithms", Addison Wesley

**CSE604: EMBEDDED SYSTEMS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Overview of Embedded System: Embedded System, Categories and Requirements of Embedded Systems, Challenges and Issues in Embedded Software Development, Applications of Embedded Systems in Consumer Electronics, Control System, Biomedical Systems, Handheld computers, Communication devices.

**Unit 2:**

Embedded Hardware & Software Development Environment: Hardware Architecture, Micro- Controller Architecture, Communication Interface Standards, Embedded System Development Process, Embedded Operating systems, Types of Embedded Operating systems.

**Unit 3:**

Design quality and Microcontroller: Quality matrix, software and hardware, Estimation , 8 Bit microcontrollers Architecture, on chip peripherals, instruction set/programming of Intel MCS51 family (8 bit ) Inter facing of 8051 with LCD, ADC, sensors, stepper motor, key board, DAC, memory .

**Unit 4:**

Real Time & Database Applications: Real- Time Embedded Software Development, Sending a Message over a Serial Link, Simulation of a Process Control System, Controlling an Appliance from the RTLinux System, Embedded Database Applications using examples like Salary Survey, Energy Meter Readings.

**Unit 5:**

Programming Languages for Embedded Systems: Tools for building embedded systems - with case studies.

Microchip PIC16 family PIC16F873 processor features architecture memory organization register file map I/O ports PORTA - PORTB PORTC Data EEPROM and flash program memory Asynchronous serial port SPI mode I2C mode.

#### Text/References

- 1 . Rajkamal, "Embedded System Architecture Programming Design" Tata Publication
2. Dr. K. V. K. K. Prasad "Embedded / real time System: Concepts, Design, & Programming Black Book" Dreamtech Press Publication
3. Dr. K. V. K. K. Prasad, Gupta Dass, Verma "Programming for Embedded system" Wiley Dreamtech India Pvt. Ltd. Graw Hill
4. Raj Kamal, "Microcontrollers, Architecture, Programming, Interface & System Design" Pearson Education
5. Sriram Iyer , Pankaj Gupta,"Embedded Real ,time Systems Programming", Tata Mc Graw Hill. .
6. Tammy Nergaard "Embedded Systems Architecture - A Comprehensive Guide For Engineering & Programming", Elsevier Publication

### **CSE605: THEORY OF COMPUTATION**

**(L: 3: T: 1)**

**Max.Marks:100**  
**Min.Marks:40**

#### **Unit 1:**

Finite Automata & Regular Expression: Basic Concepts of finite state system, Deterministic and non-deterministic finite automation and designing regular expressions, relationship between regular expression & Finite automata minimization of finite automation mealy & Moore Machines.

#### **Unit 2:**

Regular Sets of Regular Grammars: Basic Definition of Formal Language and Grammars. Regular Sets and Regular Grammars, closure proportion of regular sets, Pumping lemma for regular sets, decision Algorithms for regular sets, Myhell\_Nerod Theory & Organization of Finite Automata.

#### **Unit 3:**

Context Free Languages& Pushdown Automata: Context Free Grammars – Derivations and Languages –Relationship between derivation and derivation trees – ambiguity – simplification of CEG – Greiback Normal form –Chomsky normal forms – Problems related to CNF and GNF Pushdown Automata: Definitions – Moves –Instantaneous descriptions – Deterministic pushdown automata – Pushdown automata and CFL - pumping lemma for CFL - Applications of pumping Lemma.

#### **Unit 4:**

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. Undecidability: Properties of recursive and Recursively enumerable languages – Universal Turing Machines as an undecidable problem – Universal Languages – Rice's Theorems.

#### **Unit 5:**

Linear bounded Automata Context Sensitive Language: Chomsky Hierarchy of Languages and automata, Basic Definition & descriptions of Theory & Organization of Linear bounded Automata Properties of context-sensitive languages.

#### Text/References

1. John E. Hopcroft, Rajeev Motwani and J.D. Ullman, Introduction to Automata theory Languages and Computation, Pearson Education Asia.
2. John C. Martin, Introduction to Languages and the Theory of Computation, TMH.
3. Cohen, Introduction to Computer Theory, Pearson Education Asia.

### **CSE606.1: DIGITAL SIGNAL PROCESSING**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

#### **Unit 1:**

Flow Graph and Matrix Representation of Digital Filters: Signal flow graph representation of digital network, matrix representation, basic network structures for IIR and FIR systems, Telligen's theorem for digital filters and its applications.

#### **Unit 2:**

Digital filter Design Techniques: Design of IIR and FIR digital filters, computer aided design of IIR and FIR filters, comparison of IIR and FIR digital filters.

#### **Unit 3:**

Computation of the Discrete Fourier Transform: Goertzel algorithm, FT algorithms, decimation in time and frequency, FFT algorithm for N a composite number, Chirp Z transforms (CZT).

#### **Unit 4:**

Discrete Random Signals: Discrete time random process, averages spectrum representations of infinite energy signals, response of linear system to random signals

#### **Unit 5:**

Power Spectrum Estimation: Basic principles of spectrum estimation, estimates of the auto covariance, power spectrum, cross covariance and cross spectrum.

## Text/References

1. Salivahanan and Vallavaraj-Digital Signal Processing, Tata Mc-Graw Hill.
2. Nagrath-Signals and Systems, Tata Mc-Graw Hill.
3. Oppenheim A.V.-Signals and Systems,PHI.
4. Oppenheim A.V.-Digital Signal Processing,PHI.
5. Lathi-Signals and Linear System, Oxford.

**CSE606.2: ADVANCED SOFTWARE ENGINEERING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

SOFTWARE CONFIGURATION MANAGEMENT: SCM Process, Objects in Software configuration, Version control, Change control, Configuration audit, Status reporting, SCM standards .SOFTWARE QUALITY ASSURANCE: Quality Concepts, Quality Movement, SQA Activities and Formal Approaches to SQA.

**Unit 2:**

SOFTWARE TESTING AND DEBUGGING: Software Testing Fundamentals .Text Case Design ,White –Box Testing, Basis Path testing, Control Structure Testing, Black Box Testing and Testing for Specialized Environments, Architectures and Applications. Program Error, Debugging Process (Information Gathering, Fault Isolation, Fault Confirmation, Documentation, Fixing fault, Testing) Debugging Example.

**Unit 3:**

MANAGING TEAM: Understanding behavior and selecting right person for the job, Motivation, working in groups, decision making, leadership and organizational structures. INTERNATIONAL STANDARDS: Importance and defining software quality, ISO 9126, BS 6079 planning steps, ISO 12207 approach to software lifecycle data.

**Unit 4:**

WEB ENGINEERING: Attributes of Web-Based Applications. Process, Modeling activity, Analysis modeling for WebApps, Design- functional, information & interaction, testing WebApps- content, navigation, configuration, and performance testing.

**Unit 5:**

PROJECT MANAGEMENT FOR SPECIAL CLASSES OF SOFTWARE PROJECTS: Using CASE tools, CBSE, Re-engineering, forward engineering, client/server software engineering, outsourcing, Software project management standards. Change and Content Management of Web Engineering.

## Text/References

1. R. G. Pressman – Software Engineering, TMH
2. Behforooz, Software Engineering Fundamentals, OUP
3. Ghezzi, Software Engineering, PHI
4. Pankaj Jalote – An Integrated Approach to Software Engineering, NAROSA.
5. Object Oriented & Classical Software Engineering (Fifth Edition), SCHACH, TMH
6. Vans Vlet, Software Engineering, SPD
7. Uma, Essentials of Software Engineering, Jaico
8. Sommerville, Ian – Software Engineering, Pearson Education
9. Benmenachen, Software Quality, Vikas
10. IEEE Standards on Software Engineering.
11. Kane, Software Defect Prevention, SPD

### **CSE606.3: MICROWAVE AND SATELLITE COMMUNICATION**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Microwave Transmission System: General representation of E M field in terms of TEM, TE and TM components, Uniform guide structures, rectangular wave guides, Circular Wave guides, Solution in terms of various modes, Properties of propagating and evanescent modes, Dominant modes, Normalized model voltages and currents, Power flow and energy storage in modes frequency range of operation for single mode working, effect of higher order modes, Strip line and micro strip lines-general properties, Comparison of coaxial, Micro strip and rectangular wave guides in terms of band width, power handling capacity, economical consideration etc.

**Unit 2:**

Origin and brief history of satellite communication; Elements of a satellite communication link; Current status of satellite communication. Orbital Mechanism and Launching of Satellite: Equation of orbit, Describing the orbit, Location the satellite in the orbit, Locating the satellite with respect to earth, Orbital elements, Look angle determination, Elevation and Azimuth calculation, Geostationary and other orbits, Orbital perturbations, Orbit determination, Mechanics of launching a synchronous satellite, Selecting a launch vehicle.

**Unit 3:**

Space Craft: Satellite subsystems, Altitude and Orbit Control (AOCS), Telemetry, Tracking and Command (TT&C). Communication subsystems, Transponders, Spacecraft antennas, Frequency re-use antennas.

**Unit 4:**

Satellite Channel and Link Design: Basic transmission theory, Noise temperature, Calculation of system noise temperature, Noise figure, G/T ratio of earth stations, Design of down links and uplinks using C/N ratio, FM improvement factor for multi-channel signals, Link Design for FDM/FM, TV signals and Digital Signals.

**Unit 5:**

Earth Station Technology: Earth station design, Basic antenna theory, antenna noise temperature; Tracking; Design of small earth station antennas, Low noise amplifiers, High power amplifiers, FDM and TDM systems.

Text/References

1. George Kenndy - "Electronic Communication System", Tata McGraw Hill.
2. K.D. Prasad- "Antena & Wave Propagation." Satya Prakashna.
3. Tri T Ha - "Digital Satellite Communication".

### **CSE607: SHELL PROGRAMMING LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

1. Practice commands: cp, mv, rm, ln, ls, who, echo, cat, mkdir, rmdir. Wildcards (?, \*) , I/O redirection (<, >, >>), pipelines (|)
2. Practice commands: xargs, alias, set-unset, setenv-unsetenv, export, source, ps, job, kill.
3. Practice commands: head, tail, cut, paste, sed, grep, sort, uniq, find , locate, chmod.
4. Writing a simple shell script to echo who is logged in.
5. Write a shell script to display only executable files in a given directory.
6. Write a shell script to sort a list of file either in alphabetic order or largest file first according to user response.
7. Write a shell script to count the lines. Words and characters in its input (Note : Don't use wc).
8. Write a shell script to print end of a glossary file in reverse order using array. (Hint: use awk tail).
9. Modify cal command to accept more than one month (e.g. \$cal Oct, Nov, )(Hint : use alias too)
10. Write a shell script to check whether Ram logged in, continue checking every 60 seconds until success.

### **CSE608: NETWORK LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

1. The lab is to be conducted in Perl programming language, Perl works on all platforms (including windows)
2. Write few basic programs of Perl.
  - a. A Hello World Program
  - b. Write a program to add to 10 numbers.
  - c. Write a program of reading input from the keyboard and displaying them on monitor.
  - d. Write a program to take two strings as input and compare them
3. To understand advance constructs of Perl
  - a. Write a program to create a list of your course (all theory courses in current semester) using array and print them.
  - b. Write a program to accept ten number, store it into a hash table (Perl have itself) and when asked by user tell him that number exists or not. (do not store duplicate numbers)
  - c. Write a program to compute the number of lines in a file.
4. Find the IP address of a host or turn an IP address into a name.
5. Connect to an FTP server and get or put files. Automate the one-time transfer of many files to download the file everyday, which have changed since yesterday. (use Net:FTP)
6. Write a program to send mail. The programs should monitor system resources like disk space and notify admin by mail when disk space becomes dangerously low. (use Net:mail)
7. Fetch mail from a POP3 server (use Net:pop3)
8. Find out who owns a domain (use Net:whois , Whois is a service provided by domain name registration authorities to identify owners of domain names)
9. Test whether a machine is alive. machine can be specified using IP address or domain name of machine.
10. You have a URL that fetch its content from a Perl script, convert it to ASCII text (by stripping html tags) and display it.
11. Writing a TCP Client, Writing a TCP Server and Communicate some data over TCP

### **CSE609: WEB PROGRAMING LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**  
**Min.Marks:38**

1. Develop a static html page using style sheet to show your own profile.  
Add a page to show 5 photos and  
Add a page to show your academics in a table  
Add a page containing 5 links to your favorite website  
Add navigational links to all above pages (add menu).
2. Update your homepage, by creating few html file (e.g. header, footer, left-sidebar, right), in these file you will put all html code to be shown on every page.
3. Use Cascading Style Sheets to format your all pages in a common format.
4. Basic Php programs:  
Write a simple "hello word" program using php.  
Write a program to accept two strings (name and age) from user. Print welcome statement e.g. " Hi Ram, your age is 24."  
Write a program to create a calculator, which can support add, subtraction and multiply and division operation.  
Write a program to take input parameters for a table (no. of rows and no. of columns), and create the desired table.  
Create a "Contact Me" page -

Ask user to enter his name, email ID,  
 Use Java-Script to verify entered email address.  
 Store submitted value in a MySQL database.  
 Display latest 5 submitted records in contact me page.  
 Display above record with navigation support. e.g. (next, previous, first, last).

### **CSE610: MICROCONTROLLER LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**  
**Min.Marks:38**

1. Write a program to add two 2-byte numbers with a 3-byte sum.
2. Write a program to add an array of 8 numbers using loop.
3. Write a program to convert temperature from Fahrenheit to Centigrade.
4. Implement a sequencer traffic light controller.
- 5-6. Implement real time interrupt.
- 7-8. Interface microcontroller with stepper motor and move motor by given steps.
- 9-10. Interface, test and control LED display with Microcontroller.
- 11-12. Implement a watchdog timer and test the same to check infinite loop.

### **CSE 611 ENTREPRENEURSHIP DEVELOPMENT**

**(L: 0; T: 0; P=2)**

**Max.Marks:75**  
**Min.Marks:38**

- 1 Definition of entrepreneur, qualities of a successful entrepreneur, Charms of being an entrepreneur, achievement- motivation, leadership and entrepreneurial competencies.
- 2 Decision-making, procedures and formalities for starting own business, financial support system.
- 3 Identification and selection of business opportunities and market survey, business plan. Implementation and customer satisfaction.
- 4 Business crises, problem-solving attitude, communication skill. Government policies for entrepreneurs.
- 5 Knowledge based enterprises, Scope of entrepreneur in present context, area of future entrepreneurship.
- 6 Marketing & Sales Promotion, Techno-Economic Feasibility Assessment by Preparation of Preliminary & Detailed project report.

## **CSE701: COMPILER CONSTRUCTION**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Compiler, Translator, Interpreter definition, Phase of compiler introduction to one pass & Multipass compilers, Bootstrapping, Review of Finite automata lexical analyzer, Input, buffering, Recognition of tokens, Idea about LEX: A lexical analyzer generator, Error handling.

**Unit 2:**

Review of CFG Ambiguity of grammars, Introduction to parsing. Bottom up parsing Top down parsing techniques, Shift reduce parsing, Operator precedence parsing, Recursive descent parsing predictive parsers. LL grammars & passers error handling of LL parser. LR parsers, Construction of SLR, Conical LR & LALR parsing tables, parsing with ambiguous grammar. Introduction of automatic parser generator: YACC error handling in LR parsers.

**Unit 3:**

Syntax directed definitions; Construction of syntax trees, L-attributed definitions, Top down translation. Specification of a type checker, Intermediate code forms using postfix notation and three address code, Representing TAC using triples and quadruples, Translation of assignment statement. Boolean expression and control structures.

**Unit 4:**

Storage organization, Storage allocation, Strategies, Activation records, Accessing local and non local names in a block structured language, Parameters passing, Symbol table organization, Data structures used in symbol tables.

**Unit 5:**

Definition of basic block control flow graphs, DAG representation of basic block, Advantages of DAG, Sources of optimization, Loop optimization, Idea about global data flow analysis, Loop invariant computation, Peephole optimization, Issues in design of code generator, A simple code generator, Code generation from DAG.

Text/References

1. Aho, Sethi, Ullman - "Compiler Principles, Techniques and Tools" - Pearson Education.
2. Holub - "Compiler Design in C" - PHI.
3. A V Aho, R. Sethi, J D Ullman, "Compilers: Principles, Techniques, and Tools", Pearson Education, ISBN 81 - 7758 - 590 - 8
- 4 K. Cooper, L. Torczon, "Engineering a Compiler", Morgan Kaufmann Publishers, ISBN 81 - 8147 - 369 -
5. K. Louden, "Compiler Construction: Principles and Practice", Thomson Brookes/Cole (ISE), 2003, ISBN 981 - 243 - 694 - 4 .
6. J. R. Levine, T. Mason, D. Brown, "Lex & Yacc", O'Reilly, 2000, ISBN 81-7366062 - X
7. Chattopadhyay, "Compiler Design", Prentice-Hall of India, 2005, ISBN 81-2032725-X.

## **CSE702: DATA MINING AND WAREHOUSING**

**(L: 3: T: 1)**

**Max.Marks:100**  
**Min.Marks:40**

**Unit 1:**

Overview, Motivation(for Data Mining),Data Mining-Definition & Functionalities, Data Processing, Form of Data Preprocessing, Data Cleaning: Missing Values, Noisy Data, (Binning, Clustering, Regression, Computer and Human inspection), Inconsistent Data, Data Integration and Transformation. Data Reduction:-Data Cube Aggregation, Dimensionality reduction, Data Compression, Numerosity Reduction, Clustering, Discretization and Concept hierarchy generation.

**Unit2:**

Concept Description:- Definition, Data Generalization, Analytical Characterization, Analysis of attribute relevance, Mining Class comparisons, Statistical measures in large Databases. Measuring Central Tendency, Measuring Dispersion of Data, Graph Displays of Basic Statistical class Description, Mining Association Rules in Large Databases, Association rule mining, mining Single-Dimensional Boolean Association rules from Transactional Databases– Apriori Algorithm, Mining Multilevel Association rules from Transaction Databases and Mining Multi- Dimensional Association rules from Relational Databases.

**Unit 3:**

What is Classification & Prediction, Issues regarding Classification and prediction, Decision tree, Bayesian Classification, Classification by Back propagation, Multilayer feed-forward Neural Network, Back propagation Algorithm, Classification methods K-nearest neighbor classifiers, Genetic Algorithm. Cluster Analysis: Data types in cluster analysis, Categories of clustering methods, Partitioning methods. Hierarchical Clustering- CURE and Chameleon. Density Based Methods-DBSCAN, OPTICS. Grid Based Methods- STING, CLIQUE. Model Based Method –Statistical Approach, Neural Network approach, Outlier Analysis

**Unit 4:**

Data Warehousing: Overview, Definition, Delivery Process, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data Marting.

**Unit 5:**

Aggregation, Historical information, Query Facility, OLAP function and Tools. OLAP Servers, ROLAP, MOLAP, HOLAP, Data Mining interface, Security, Backup and Recovery, Tuning Data Warehouse, Testing Data Warehouse.

## Text/References

1. Rob Mattison-Web Warehousing and Knowledge Management, Tata Mc-Graw Hill.
2. Shelley Powers-Dynamic Web Publishing, Techmedia.
3. Anahory-Data Warehousing in the Real World, Pearson Education Asia.

**CSE703: LOGIC SYNTHESIS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to VLSI, circuits Asics and Moore's Law. Microelectronic Design, Styles, four phases in creating Microelectronics chips computer Aided Synthesis and Optimization. Algorithms Review of Graph Definitions and Notations Decision and Optimization Problems, Shortest and Longest Path Problems, Vertex Cover, Graph, Coloring, Clique covering and partitioning Algorithms Boolean Algebra and Representation of Boolean Functions, binary Decision diagrams. Satisfiability and cover problems.

**Unit 2:**

Hardware Modeling: Introduction to Hardware Modeling Language, State Diagrams. Data flow and Sequencing Graphs. Compilation and Behavioral Optimization Techniques. Circuits Specifications for Architectural Synthesis Resources and constraints. Fundamental Architectural Synthesis Problems Temporal Domain Scheduling Spatial Domain Binding Hierarchical Models and Synchronization Problem. Area and performance estimation-Resource Dominated circuits and General Circuits.

**Unit 3:**

Scheduling Algorithms: Model for Scheduling Problems, Scheduling without Resource, Constraints-Unconstrained Scheduling ASAP Scheduling Algorithms Latency. Constrained Scheduling. ALAP scheduling. Under Timing Constraints and Relative Scheduling with Resource Constraints Integer Linear Programming Model, Multiprocessor Scheduling, Heuristic Scheduling Algorithms (List Scheduling). Force Directed Scheduling.

**Unit 4:**

Two Level Combination Logic Optimization: Logic Optimization Principles-Definitions, Exact Logic Minimization, Heuristic, Logic Minimization, and Testability Properties Operations on Two level logic Cover-positional Cube Notation, Functions with Multivolume inputs and list oriented manipulation. Algorithms for logic minimization.

**Unit 5:**

Sequential logic optimization: Introduction, Sequential circuit optimization using state based models-state minimization, state encoding. Sequential circuit optimization using network models. Implicit finite state machine traversal methods. Testability consideration for synchronous circuits.

Text/References

1. "Digital Integrated Circuit", J.M.Rabaey, Chandrasan, Nicolic, Pearson
2. "CMOS Digital Integrated Circuit", S.M.Kang & Y.Leblebici, TMH
3. "Modern VLSI Design" Wayne Wolf, Pearson
4. "Algorithm for VLSI Design & Automation", N.Sherwani, Kluwer
5. "VHDL", Bhaskar, PHI
6. " Digital Integrated Circuits" Demassa & Ciccone, Willey Pub.
7. "Modern VLSI Design: system on silicon" Wayne Wolf; Addison Wesley Longman Publisher
8. "Basic VLSI Design" Douglas A. Pucknell & Kamran Eshranghian; PHI
9. "CMOS Circuit Design, Layout & Simulation", R.J.Baker, H.W.Lee, D.E. Boyee, PHI

## **CSE704: ARTIFICIAL INTELLIGENCE**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Meaning and definition of artificial intelligence, Various types of production systems, Characteristics of production systems, Study and comparison of breadth first search and depth first search. Techniques, other Search Techniques like hill Climbing, Best first Search. A\* algorithm, AO\* algorithms etc, and various types of control strategies.

**Unit 2:**

Knowledge Representation, Problems in representing knowledge, knowledge representation using propositional and predicate logic, comparison of propositional and predicate logic, Resolution, refutation, deduction, theorem proving, inferencing, monotonic and non-monotonic reasoning.

**Unit 3:**

Probabilistic reasoning, Baye's theorem, semantic networks scripts schemas, frames, conceptual dependency and fuzzy logic, forward and backward reasoning.

**Unit 4:**

Game playing techniques like minimax procedure, alpha-beta cut-offs etc, planning, Study of the block world problem in robotics, Introduction to understanding and natural languages processing.

**Unit 5:**

Introduction to learning, Various techniques used in learning, introduction to neural networks, applications of neural networks, common sense, reasoning, some example of expert systems.

## Text/References

## Text Books.

1. Eugene, Chamiak, Drew Mcdennott: "Introduction to artificial intelligence."
2. Elaine Rich and Kerin Knight: "Artificial Intelligence."
3. Kishen Mehrotra, Sanjay Rawika, K Mohan; "Artificial Neural Network."
4. Stuart Russell & Peter Norvig : "Artificial Intelligence: A Modern Approach", Prentice Hall, 2nd Edition.
5. Ivan Bratko : "Prolog Programming For Artificial Intelligence" ,2nd Edition Addison Wesley, 1990..
6. Herbert A. Simon, "The Sciences of the Artificial ", MIT Press, 3rd Edition ( 2nd Printing ),1998.
7. Tim Jones "Artificial Intelligence Application Programming" M. Dreamtech Publication

**CSE705: MULTIMEDIA SYSTEMS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to Multimedia, Multimedia Information, Multimedia Objects, Multimedia in business and work. Convergence of Computer, Communication and Entertainment products and Stages of Multimedia Projects, Multimedia hardware, Memory & storage devices, Communication devices, Multimedia software's, presentation tools, tools for object generations, video, sound, image capturing, authoring tools, card and page based authoring tools.

**Unit 2:**

Multimedia Building Blocks Text, Sound MIDI, Digital Audio, audio file formats, MIDI under windows environment Audio & Video Capture.

**Unit 3:**

Data Compression Huffman Coding, Shannon Fano Algorithm, Huffman Algorithms, Adaptive Coding, Arithmetic Coding Higher Order Modeling. Finite Context Modeling, Dictionary based Compression, Sliding Window Compression, LZ77, LZW compression, Compression, Compression ratio loss less & lossy compression.

**Unit 4:**

Speech Compression & Synthesis Digital Audio concepts, Sampling Variables, Loss less compression of sound, loss compression & silence compression.

**Unit 5:**

Images: Multiple monitors, bitmaps, Vector drawing, lossy graphic compression, image file format animations Images standards, JPEG Compression, Zig Zag Coding, Multimedia Database. Content based retrieval for text and images, Video: Video representation, Colors, Video Compression, MPEG standards, MHEG Standard Video Streaming on net, Video Conferencing, Multimedia Broadcast Services, Indexing and retrieval of Video Database, recent development in Multimedia

## Text/References

1. Ranjan Parekh, "Principles of Multimedia", TMH, ISBN 0-07-058833-3
2. Ralf Steinmetz and Klara Nahrstedt "Multimedia Computing, Communication and Applications", Pearson Education.
2. Ze-Nian Li, Marks S. Drew, "Fundamentals of Multimedia", Pearson Education.
2. Nigel Chapman and Jenny Chapman. Wiley "Digital Multimedia"
3. A. K. Jain "Fundamentals of Digital Image Processing", PHI
4. Gonzalez, Woods, "Digital Image Processing" Addison Wesley
5. Mark Nelson "Data Compression Book ", BPB.
6. Judith Jeffcoate "Multimedia in Practice":, PHI.

## **CSE706.1: SERVICE ORIENTED ARCHITECTURE**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

SOA Fundamentals: Defining SOA, Business Value of SOA, Evolution of SOA, SOA characteristics, concept of a service in SOA, misperceptions about SOA, Basic SOA architecture, infrastructure services, Enterprise Service Bus (ESB), SOA Enterprise Software models, IBM On Demand operating environment.

**Unit 2:**

Web services Technologies: XML technologies – XML, DTD, XSD, XSLT, XQuery, XPath Web service technologies - Web services and SOA, WSDL, SOAP, UDDI WS Standards (WS-\*) - Web services and Service-oriented enterprise (SOE), WS-Coordination and WS-Transaction, Business Process Execution Language for Web Services (BPEL4WS), WS-Security and the Web services security specifications, WS-Reliable Messaging, WS-Policy, WS-Attachments.

**Unit 3:**

SOA Planning and Analysis: Stages of the SOA lifecycle, SOA Delivery Strategies, service-oriented analysis, Capture and assess business and IT issues and drivers, determining non-functional

requirements (e.g., technical constraints, business constraints, runtime qualities, non-runtime qualities), business centric SOA and its benefits, Service modeling, Basic modeling building blocks, service models for legacy application integration and enterprise integration, Enterprise solution assets(ESA) .

**Unit 4:**

SOA Design and implementation: service-oriented design process, design activities, determine services and tasks based on business process model, choosing appropriate standards, articulate architecture, mapping business processes to technology, designing service integration environment (e.g., ESB, registry), Tools available for appropriate designing, implementing SOA, security implementation, implementation of integration patterns, services enablement, quality assurance.

**Unit 5:**

Managing SOA Environment: Distributing service management and monitoring concepts, operational management challenges, Service-level agreement considerations, SOA governance (SLA, roles and responsibilities, policies, critical success factors, and metrics), QoS compliance in SOA governance, role of ESB in SOA governance, impact of changes to services in the SOA lifecycle.

Text/References

1. Service-oriented architecture (SOA): Dirk krafzig, Karl banke and Dirk slama
2. Service-oriented Architecture: A field guide to integrating XML and Web services: Thomas Erl
3. SOA: Principle of service design: Thomas Erl
4. SOA Design patterns: Thomas Erl
5. Service-oriented Architecture ontology: Chris Harding

## **CSE706.2: OPTICAL COMMUNICATION**

**(L: 3: T: 1)**

**Max.Marks:100**  
**Min.Marks:40**

**Unit 1:**

Introduction to optical communication principles of light transmission optical fiber modes and configurations, Mode theory for circular wave-guides, Single-mode fibers, Multimode fibers, Numerical aperture, Mode field diameter, V-number, fiber materials, Fiber fabrication techniques.

**Unit 2:**

Optical sources, LED'S, LASER diodes, Model reflection noise, Power launching and coupling, population inversion, fiber splicing, optical connectors, Photo-detectors, PIN, Avalanche detector, Response time, Avalanche multiplication noise.

**Unit 3:**

Signal degradation in optical fibers, Attenuation losses, Signal distortion in optical wave guides, Material dispersion, Wave guide dispersion, Chromatic dispersion, Inter-modal distortion, Pulse

broadening in Graded index fibers, Mode coupling, Advance fiber designs: dispersion shifted, Dispersion flattened, Dispersion compensating fibers, Design optimization of single mode fibers.

**Unit 4:**

Coherent optical fiber communication, Modulation techniques for Homodyne and Heterodyne systems, Optical filter link design. Rise time budget and link power budget, Long haul systems bit error rate, line coding, NRZ, RZ, Block Codes eye pattern.

**Unit 5:**

Advance system and techniques, wavelength division multiplexing, optical amplifiers semiconductor amplifier, EDFA, Comparison between semiconductor and optical amplifier, Gain band width, Photonic switching, Optical Networks. Optical fiber bus, Ring topology, Star architectures, FDDI, SON-ET.

Text/References

1. Gerd Keiser-Optical Fiber Communications, Tata Mc Graw Hill.
2. J.N.Senior-Optical Fiber Communication,Prentice Hall of India.
3. J.Gowar-Optical Communication Systems, Prentice Hall of India.
4. J.Wilson & Hawkes-Opto Electronics-An Introduction,prentice Hall of India

### **CSE706.3: REAL TIME SYSTEMS**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Introduction: Definition, Typical Real Time Applications: Digital Control, High Level Controls, Signal Processing etc., Release Times, Deadlines, and Timing Constraints, Hard Real Time Systems and Soft Real Time Systems, Reference Models for Real Time Systems: Processors and Resources, Temporal Parameters of Real Time Workload, Periodic Task Model, Precedence Constraints and Data Dependency.

**Unit 2:**

Real Time Scheduling: Common Approaches to Real Time Scheduling: Clock Driven Approach, Weighted Round Robin Approach, Priority Driven Approach, Dynamic Versus Static Systems, Optimality of Effective-Deadline-First (EDF) and Least-Slack-Time-First (LST) Algorithms, Offline Versus Online Scheduling, Scheduling Aperiodic and Sporadic jobs in Priority Driven and Clock Driven Systems.

**Unit 3:**

Resources Access Control: Effect of Resource Contention and Resource Access Control (RAC), Non-preemptive Critical Sections, Basic Priority-Inheritance and Priority-Ceiling Protocols, Stack Based Priority-Ceiling Protocol, Use of Priority-Ceiling Protocol in Dynamic Priority Systems, Preemption Ceiling Protocol, Access Control in Multiple-Unit Resources, Controlling Concurrent Accesses to Data Objects.

**Unit 4:**

Multiprocessor System Environment: Multiprocessor and Distributed System Model, Multiprocessor Priority-Ceiling Protocol, Schedulability of Fixed-Priority End-to-End Periodic Tasks, Scheduling Algorithms for End-to-End Periodic Tasks, End-to-End Tasks in Heterogeneous Systems, Predictability and Validation of Dynamic Multiprocessor Systems, Scheduling of Tasks with Temporal Distance Constraints.

**Unit 5:**

Real Time Communication: Model of Real Time Communication, Priority-Based Service and Weighted Round- Robin Service Disciplines for Switched Networks, Medium Access Control Protocols for Broadcast Networks, Internet and Resource Reservation Protocols, Real Time Protocols, Communication in Multicomputer System, An Overview of Real Time Operating Systems.

Text/References

1. "Embedded System Design" Frank Vahid & Tony Givargis; John Wiley & sons, Inc.
2. "Real – Time Systems and software" Alan C. Shaw ; John Wiley & Sons Inc
3. "Fundamentals of embedded Software", Daniel W. Lewis, Pearson
4. "Real time Systems", J. W. S. Liu, Pearson
5. "Embedded Realtime System Programming", S. V. Iyer and P. Gupta, TMH
6. "An Embedded System Primer" David E. Simon; Addison-Wesley Pub
7. "Embedded System Design" Steve Heath; Butterworth-Heinemann Pub.
8. "Embedded System Computer Architecture" Graham Wilson, Butterworth-Heinemann,

## **CSE707: COMPILER DESIGN LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**  
**Min.Marks:38**

1. Develop a lexical analyzer to recognize a few patterns in PASCAL and C.
  - a. (ex: identifiers, constants, comments, operators etc.)
2. Write a program to parse using Brute force technique of Top down parsing.
3. Develop on LL (1) parser (Construct parse table also).
4. Develop an operator precedence parser (Construct parse table also)
5. Develop a recursive descent parser.
6. Write a program for generating for various intermediate code forms
  - a. i) Three address code ii) Polish notation
7. Write a program to simulate Heap storage allocation strategy
8. Generate Lexical analyzer using LEX
9. Generate YACC specification for a few syntactic categories.
10. Given any intermediate code form implement code optimization techniques

## CSE708: DATA MINING AND WAREHOUSING LAB

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**

**Min.Marks:38**

The objective of the lab exercises is to use data mining techniques to use standard databases available to understand DM processes using any DM tool)

2. Gain insight for running pre- defined decision trees and explore results using MS OLAP Analytics.  
6. Using IBM OLAP Miner – Understand the use of data mining for evaluating the content of multidimensional cubes.

7. Using Teradata Warehouse Miner – Create mining models that are executed in SQL.

( Portal work : The objective of this lab exercises is to integrate pre-built reports into a portal application )

8. Publish and analyze a business intelligence portal.

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

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

8. Publish metadata stored in the repository.

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

Case study

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

4. Design and build a Data Warehouse using bottom up approach titled 'Citizen Information System'.

## CSE709: LOGIC SYNTHESIS LAB

**(L: 0: T: 0 P: 2)**

**Max.Marks:75**

**Min.Marks:38**

1. Write a program which reads simple digital circuit (of size up to 10 gates) in blif / Boolean equation and display schematic in graphics format.

2. Write a program to convert Blif format into Boolean equation.

3. Write a program that estimate area of circuit (specified as Blif or Boolean equation) using library binding technique of simple circuit (up to 10 gates).

4. Write a program to implement state machine up to 5 states.

5. Write a program to count 4-input lookup table in a simple circuit (up to 10 gates specified as Blif or Boolean equation).

6. Write a program to obtain sequencing graph for a given set of arithmetic expression (up to 10 nodes)

7. Write VHDL Codes for all gates with all Modeling.

8. Write VHDL Codes & Test bench for half adder and full adder.

**CSE801: INFORMATION SYSTEM AND SECURITIES****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to security attacks, services and mechanism, introduction to cryptography.

Conventional Encryption: Conventional encryption model, classical encryption techniques- substitution ciphers and transposition ciphers, cryptanalysis, stereography, stream and block ciphers.

Modern Block Ciphers: Block ciphers principals, Shannon's theory of confusion and diffusion, fiestal structure, data encryption standard(DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA, confidentiality using conventional encryption, traffic confidentiality, key distribution, random number generation.

**Unit 2:**

Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat's and Euler's

theorem, primality testing, Euclid's Algorithm, Chinese Remainder theorem, discrete logarithms.

Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffie-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography, Elganel encryption.

**Unit 3:**

Message Authentication and Hash Function: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions and MACS, MD5 message digest algorithm, Secure hash algorithm(SHA).

Digital Signatures: Digital Signatures, authentication protocols, digital signature standards (DSS), proof of digital signature algorithm.

**Unit 4:**

Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.

**Unit 5:**

IP Security: Architecture, Authentication header, Encapsulating security payloads, combining security associations, key management.

Web Security: Secure socket layer and transport layer security, secure electronic transaction (SET).

System Security: Intruders, Viruses and related threads, firewall design principals, trusted systems.

Text/References

1. William Stallings "Cryptography and network security, principles and practices", Pearson
2. Charlie Kaufman, Radia Perlman and mike speciner "Network security, private communication in a public world"
3. Christopher M. King, Curtis patton and RSA press "Security architecture, design deployment and operations".
4. Stephen northcatt, leny zeltser, et al "INSIDE NETWORK Perimeter Security" Pearson Education Asia.
5. Robert Bragge, Mark Rhodes, Heith straggberg "Network Security. the complete reference", Tata McGraw Hill Publication

## **CSE802: CAD FOR VLSI DESIGN**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

Modern digital systems, complexity and diversity of digital systems, productivity gap and need for CAD tools. Introduction to steps and CAD flow for designing with ASIC and FPGA.

**Unit 2:**

Introduction to VHDL, background, VHDL requirement, Elements of VHDL, top down design, convention and syntax, basic concepts in VHDL i.e. characterizing H/W languages, objects, classes, and signal assignments.

**Unit 3:**

Structural specification of H/W- Parts library, Wiring, modeling, binding alternatives, top down wiring. Design organization and parameterization. Type declaration, VHDL operators.

**Unit 4:**

VHDL subprogram parameters, overloading, predefined attributes, user defined attributes, packaging basic utilities. VHDL as a modeling language- bi-directional component modeling, multi mode component modeling,

**Unit 5:**

Examples of VHDL synthesis subsets- combinational logic synthesis, sequential circuit synthesis, state machine synthesis. VHDL language grammar. Introduction to synthetic circuits and circuit repositories.

## Text/References

1. "Digital Integrated Circuit", J.M.Rabaey, Chandrasan, Nicolic, Pearson
2. "CMOS Digital Integrated Circuit", S.M.Kang & Y.Leblebici, TMH
3. "Modern VLSI Design" Wayne Wolf, Pearson
4. "Algorithm for VLSI Design & Automation", N.Sherwani, Kluwer
5. "VHDL", Bhaskar, PHI
6. "Digital Integrated Circuits" Demassa & Ciccone, Willey Pub.
7. "Modern VLSI Design: system on silicon" Wayne Wolf; Addison Wesley Longman Publisher
8. "Basic VLSI Design" Douglas A. Pucknell & Kamran Eshranghian; PHI
9. "CMOS Circuit Design, Layout & Simulation", R.J.Baker, H.W.Lee, D.E. Boyee, PHI

## **CSE803: ADVANCED COMPUTER ARCHITECTURES**

**(L: 3: T: 1)**

**Max.Marks:100**

**Min.Marks:40**

**Unit 1:**

INTRODUCTION: Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn's & Feng's Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks; IEEE POSIX Threads: Creating and Exiting Threads, Simultaneous Execution of Threads, Thread Synchronization using Semaphore and Mutex, Canceling the Threads.

**Unit 2:**

PIPELINING AND MEMORY HIERARCHY: Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design; Memory Hierarchy Design: Advanced Optimization of Cache Performance, Memory Technology and Optimization, Cache Coherence and Synchronization Mechanisms.

**Unit 3:**

THREAD AND PROCESS LEVEL PARALLEL ARCHITECTURE: Introduction to MIMD Architecture, Multithreaded Architectures, Distributed Memory MIMD Architectures, Shared Memory MIMD Architecture, Clustering, Instruction Level Data Parallel Architecture, SIMD Architecture, Fine Grained and Coarse Grained SIMD Architecture, Associative and Neural Architecture, Data Parallel Pipelined and Systolic Architectures, Vector Architectures.

**Unit 4:**

Parallel Algorithms: PRAM Algorithms: Parallel Reduction, Prefix Sums, Preorder Tree Traversal, Merging two Sorted lists; Matrix Multiplication: Row Column Oriented Algorithms, Block Oriented Algorithms; Parallel Quicksort, Hyper Quick sort; Solving Linear Systems: Gaussian Elimination, Jacobi Algorithm; Parallel Algorithm Design Strategies.

**Unit 5:**

Developing Parallel Computing Applications: OpenMP Implementation in 'C': Execution Model, Memory Model; Directives: Conditional Compilation, Internal Control Variables, Parallel Construct, Work Sharing Constructs, Combined Parallel Work-Sharing Constructs, Master and Synchronization Constructs; Run-Time Library Routines: Execution Environment Routines, Lock Routines, Timing Routines; Simple Examples in 'C'. Basics of MPI.

## Text/References

1. Hwang, K. "Advanced Computer architecture with parallel programming", McGraw Hill, 1993
2. Carter—Computer Architecture ( Schaum Series), TMH
3. Patterson D.A. and Hennessy , J.L. "Computer architecture a quantitative approach", 2nd ed., Morgan Kaufman, 1996
4. Hwang & Briggs—Computer Architecture & Parallel Processing, TMH
5. Stone, H.S., "Advanced Computerat", Addison Wesley, 1989

**CSE804.1: DISTRIBUTED SYSTEMS****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

CHARACTERIZATION OF DISTRIBUTED SYSTEMS: Introduction, Examples of distributed Systems, Resource sharing and the Web Challenges. System Models: Architectural models, Fundamental Models Theoretical Foundation for Distributed System: Limitation of Distributed system, absence of global clock, shared memory, Logical clocks, Lamport's & vectors logical clocks, Causal ordering of messages, global state, termination.

Distributed Mutual Exclusion: Classification of distributed mutual exclusion, requirement of mutual exclusion theorem, Token based and non token based algorithms, performance metric for distributed mutual exclusion algorithms.

**Unit 2:**

**DISTRIBUTED DEADLOCK DETECTION:** system model, resource Vs communication deadlocks, deadlock prevention, avoidance, detection & resolution, centralized dead lock detection, distributed dead lock detection, path pushing algorithms, edge chasing algorithms. **Agreement Protocols:** Introduction, System models, classification of Agreement Problem, Byzantine agreement problem, Consensus problem, Interactive consistency Problem, Solution to Byzantine Agreement problem, Application of Agreement problem, Atomic Commit in Distributed Database system.

**Unit 3:**

**DISTRIBUTED OBJECTS AND REMOTE INVOCATION:** Communication between distributed objects, Remote procedure call, Events and notifications, Java RMI case study.

**SECURITY:** Overview of security techniques, Cryptographic algorithms, Digital signatures Cryptography pragmatics, Case studies: Needham Schroeder, Kerberos, SSL & Millicent.

**DISTRIBUTED FILE SYSTEMS:** File service architecture, Sun Network File System, The Andrew File System, Recent advances.

**Unit 4:**

**TRANSACTIONS AND CONCURRENCY CONTROL:** Transactions, Nested transactions, Locks, Optimistic Concurrency control, Timestamp ordering, Comparison of methods for concurrency control.

**DISTRIBUTED TRANSACTIONS:** Flat and nested distributed transactions, Atomic Commit protocols, Concurrency control in distributed transactions, Distributed deadlocks, Transaction recovery.

**Replication:** System model and group communication, Fault - tolerant services, highly available services, Transactions with replicated data.

**Unit 5:**

**DISTRIBUTED ALGORITHMS:** Introduction to communication protocols, Balanced sliding window protocol, Routing algorithms, Destination based routing, APP problem, Deadlock free Packet switching, Introduction to Wave & traversal algorithms, Election algorithm.

**CORBA CASE STUDY:** CORBA RMI, CORBA services.

## Text/References

1. Andrew S. Tanenbaum & Maarten van Steen, Distributed Systems "Principles and Paradigms" Publisher: PHI.
2. George Coulouris, Jean Dollimore & Tim Kindberg, "Distributed Systems - Concepts and Design" Publisher: Pearson (LPE)
3. Pradeep K. Sinha "Distributed Operating Systems Concepts and Design" Publication: PHI.

**CSE804.2: IMAGE PROCESSING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

**Introduction and Fundamentals:** Motivation and Perspective, Applications, Components of Image Processing System, Element of Visual Perception, A Simple Image Model, Sampling and Quantization. **Image Enhancement in Spatial Domain:** Introduction; Basic Gray Level Functions – Piecewise-Linear Transformation Functions: Contrast Stretching; Histogram Specification; Histogram Equalization; Local Enhancement; Enhancement using Arithmetic/Logic Operations – Image Subtraction, Image Averaging; Basics of Spatial Filtering; Smoothing – Mean filter, Ordered Statistic Filter; Sharpening – The Laplacian.

**Unit 2:**

**Image Enhancement in Frequency Domain:** Fourier Transform and the Frequency Domain, Basis of Filtering in Frequency Domain, Filters – Low-pass, High-pass; Correspondence Between Filtering in

Spatial and Frequency Domain; Smoothing Frequency Domain Filters – Gaussian Low pass Filters; Sharpening Frequency Domain Filters – Gaussian High pass Filters; Homomorphic Filtering.  
Image Restoration: A Model of Restoration Process, Noise Models, Restoration in the presence of Noise only Spatial Filtering – Mean Filters: Arithmetic Mean filter, Geometric Mean Filter, Order Statistic Filters – Median Filter, Max and Min filters; Periodic Noise Reduction by Frequency Domain Filtering – Band pass Filters; Minimum Mean-square Error Restoration.

**Unit 3:**

Color Image Processing: Color Fundamentals, Color Models, Converting Colors to different models, Color Transformation, Smoothing and Sharpening, Color Segmentation.  
Morphological Image Processing: Introduction, Logic Operations involving Binary Images, Dilation and Erosion, Opening and Closing, Morphological Algorithms – Boundary Extraction, Region Filling, Extraction of Connected Components, Convex Hull, Thinning, Thickening.

**Unit 4:**

Registration: Introduction, Geometric Transformation – Plane to Plane transformation, Mapping, Stereo Imaging – Algorithms to Establish Correspondence, Algorithms to Recover Depth.  
Segmentation: Introduction, Region Extraction, Pixel-Based Approach, Multi-level Thresholding, Local Thresholding, Region-based Approach, Edge and Line Detection: Edge Detection, Edge Operators, Pattern Fitting Approach, Edge Linking and Edge Following, Edge Elements Extraction by Thresholding, Edge Detector Performance, Line Detection, Corner Detection.

**Unit 5:**

Feature Extraction: Representation, Topological Attributes, Geometric Attributes. Description: Boundary-based Description, Region-based Description, Relationship. Object Recognition: Deterministic Methods, Clustering, Statistical Classification, Syntactic Recognition, Tree Search, Graph Matching.

## Text/References

1. Rafael C. Gonzalez- Digital Image Processing ,Pearson Education Asia.
2. Kenneth R. Castleman - Digital Image Processin ,Pearson Education Asia.
3. Nick Effard - Digital Image Processing ,Pearson Education Asia.
4. Jain - Digital Image Processing - PHJ

**CSE804.3: NATURAL LANGUAGE PROCESSING****(L: 3: T: 1)****Max.Marks:100****Min.Marks:40****Unit 1:**

Introduction to Natural Language Understanding: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems, Linguistic Background: An outline of English syntax.

**Unit 2:**

Introduction to semantics and knowledge representation, Some applications like machine translation, database interface.

**Unit 3:**

Grammars and Parsing: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top-Down Chart Parsing. Feature Systems and Augmented Grammars: Basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

**Unit 4:**

Grammars for Natural Language: Auxiliary Verbs and Verb Phrases, Movement Phenomenon in Language, Handling questions in Context-Free Grammars. Human preferences in Parsing, Encoding uncertainty, Deterministic Parser.

**Unit 5:**

Ambiguity Resolution: Statistical Methods, Probabilistic Language Processing, Estimating Probabilities, Part-of- Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing. Semantics and Logical Form, Word senses and Ambiguity, Encoding Ambiguity in Logical Form

Text/References

1. Theory of Computer Science: K.L.P. Mishra
2. A Machine (-aided) translation: Jonathan Slocum
3. *Natural Language Programming, Argument Analysis* : by Conrad F. Sabourin

## **CSE805: INFORMATION SYSTEM AND SECURITIES LAB**

**(L: 0: T: 0 P: 4)**

**Max.Marks:100**

**Min.Marks:50**

List of Projects are as follows (Implement any one)

1. Shopping cart project using ADO.NET: This sample project has all basic features required for a shopping cart web site including Login, Registration, Add to Cart, Checkout etc. A good ASP.NET learning project using C#, ASP.NET, SQL Server.
2. Personal Assistant: This is a small project for managing personal details. Current version of this project support Address Book feature - Add, Edit and Manage contacts and addresses using VB.NET.
3. Address Book: This is a small project for managing contact details. This is a C# version of the

'Personal Assistant' project.

4. School Management System: This is a project for managing education institutes using C#.
5. Library Management System: This is an academic project for students using Java.
6. spider Alerts & Web services: This project communicates with web services and downloads Alerts from the web server using Java & XML.
7. Patient Information System: This software can be used to keep track of the patients' information and treatment details in a hospital or clinic. Some of the advanced features include patient consulting, lab information, billing etc using JSP, Servlet & JDBC.
8. Web based Address Book: This application can be used to keep track of your contacts/addresses. N Tier architecture is used to separate data layer, business layer and UI layers.

### **CSE806: VLSI DESIGN LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

Simple Design exercises:

- 01 Half adder, Full adder, Subtractor Flip Flops, 4bit comparator.
- 02 Parity generator
- 03 Bit up/down counter with load able count
- 04 Decoder and encoder
- 05 8 bit shift register
- 06 8:1 multiplexer
- 07 Test bench for a full adder
- 08 Barrel shifter
- 09 N by m binary multiplier
- 10 RISC CPU (3bit opcode, 5bit address)

TOOLS :

Xilinx Tools/ Synopsis Tools/ Cadence Tools/ Model SIM/ Leonardo Spectrum Tools/VIS/SIS Tools to be used.

### **CSE807: X-WINDOWS LAB**

**(L: 0: T: 0 P: 2)**

**Max.Marks:100**

**Min.Marks:50**

1. To understand x-windows, x-lib, x-toolkit and x network protocol and learn it's commend line argument.

Programs in C/C++ language.

2. Write a program to establish connection with x server and get the sender and protocol information.
3. Using X library of the server, write a program to create a new window of a given size, title, border, foreground and backgroundcolors.

- 4-5 To implement keyboard event handling/marking using x library.
- 6-7 To implement mouse event handling/marking using x library and interface with windows managers and drawing applications.
- 8. To implement a multiple windows application.
- 9-10 To implement various drag and drop based GUI components in Visual Basic.
- 11-12 To implement various drag and drop based GUI components in Motif and Lesstif.