J.B. INSTITUTE OF ENGINEERING & TECHNOLOGY
UGC AUTONOMOUS
(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA, NAAC)

Bhaskar nagar, Moinabad Mandal, R.R. District,
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ACADEMIC REGULATIONS (JBIET R-14), COURSE STRUCTURE AND SYLLABI FOR B. TECH

B.Tech. Regular Four Year Degree Programme
(For the batches admitted from the Academic Year 2014 - 2015)

&

B.Tech. (Lateral Entry Scheme)
(For the batches admitted from the Academic Year 2015 - 2016)

Note: The regulations hereunder are subject to amendments as may be made by the Academic Council of the College from time to time. Any or all such amendments will be effective from such date and to such batches of candidates (including those already pursuing the program) as may be decided by the Academic Council of JBIET.

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ACADEMIC REGULATIONS- R14 FOR B. TECH. (REGULAR)
Applicable for the students of B. Tech. (Regular) from the Academic Year 2014-15 and onwards

1. Award of B. Tech. Degree

A student will be declared eligible for the award of B. Tech. Degree if he fulfills the following academic regulations:

1.1 The candidate shall pursue a course of study for not less than four academic years and not more than eight academic years(i.e. No student is allowed to have more than four times detention)

1.2 After eight academic years of course of study, the candidate is permitted to write the examinations for two more years.

1.3 The candidate shall register for 213 credits and secure 206 credits with compulsory subjects as listed in Table-1.

Table-1	
Serial Number	Subject Particulars
1	All practical subjects
2	Industry oriented mini project
3	Comprehensive Assignment
4	Industrial Internship
5	Comprehensive Viva-Voce
6	Seminar
7	Project work

2. Forfeiting B.Tech Degree

The students, who fail to fulfill all the academic requirements for the award of the degree within ten academic years from the year of their admission, shall forfeit their seats in B. Tech. course.

3. Courses of study

The following courses of study are offered at present as specializations for the B. Tech. Course:

Branch Code	Branch
01	Civil Engineering
02	Electrical and Electronics Engineering
03	Mechanical Engineering
04	Electronics and Communication Engineering
05	Computer Science and Engineering
12	Information Technology
19	Electronics and Computer Engineering
25	Mining Engineering

4. Credits

Each course is normally assigned a certain number of credits as follows:

	Semester	
	Periods /Week	Credits
Theory	04+1*/4	04
	03+1*/3	03
Practical	03	02
Drawing	01+03	03
Mini Project	--	02
Comprehensive Assignment	-	02
Industrial Internship	-	02
Comprehensive Viva Voce	--	02
Seminar	6	02
Project	15	10

*Tutorial

5. Distributions and Weightage of Marks

5.1 The performance of a student in each semester shall be evaluated subject-wise for a maximum of 100 marks for a theory and 75 marks for a practical subject. In addition, industry-oriented mini-project, Comprehensive Assignment, Industrial Internship, seminar, Comprehensive viva and project work shall be evaluated for 50, 50, 50, 50, 100 and 200

marks, respectively.

5.2 For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.

5.3 For theory subjects, during a semester there shall be 2 mid-term examinations. Each mid-term examination consists of 2 parts. Part-A contains objective and Part-B contains descriptive questions and assignment. The Part-A and Part-B shall be for 10 marks each with a total duration of 1 hour 20 minutes. The Part-A is set with 20 bits of multiple choice, fill-in the blanks and matching type of questions for a total of 10 marks. The Part-B shall contain 4 full questions (two from each unit for first mid and minimum one from each unit in the second mid) out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted in first Two Units of the syllabus, the second mid-term examination shall be conducted in last Three Units. Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). The first Assignment should be submitted before the conduct of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. The total marks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each candidate. . If any candidate is absent from any subject of a mid-term examination with a valid reason (only medical reasons are allowed), re-examination will be conducted for such student.

The details of End Examination Question Paper pattern is as follows:

- *The End semesters Examination will be conducted for 75 marks which consist of two parts viz. i). Part-A for 25 marks, ii). Part –B for 50 marks*
- *Part-A is compulsory question which consists of Five questions, one from each unit and carries 5 marks each.*
- *Part-B consists of five Questions (numbered from 2 to 6) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an "either" "or" choice (that means there will be two questions from each unit and the student should answer any one question)*

5.4 For practical subjects there shall be a continuous evaluation during a semester for 25 sessional marks and 50 end semester examination marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The end semester examination shall be conducted with an external examiner and the laboratory teacher. The external examiner shall be appointed from the other colleges which are decided by the examination branch of JBIET.

5.5 For the subject having design and/or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and Estimation, the distribution shall be 25 marks for internal

evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end semester examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

5.6 There shall be Science based Mini-Project, to be taken up during the vacation after I year II Semester examination for regular students, after II year I Semester for Lateral Entry students and it will be evaluated in II Year II semester. However, the Science based mini-project marks will be added in II year II Semester. The Comprehensive Assignment shall be submitted in a report form and presented before the committee. It shall be evaluated for 50 marks. The committee consists of head of the department, and the supervisor of the Comprehensive Assignment and a senior faculty member of the department. There shall be no external marks for Comprehensive Assignment.

5.7 As per the direction from the state Government a New Course 'Gender Sensitization' has been introduced for B.Tech 2-2 Students who are studying under JBIET R14 regulation. This is a compulsory Subject and posses '2' Credits. It should be treated as a lab subject with two credits from the academic Year 2015-2016.

5.8 There shall be an Industrial internship, in collaboration with an industry of their specialization, to be taken up during the vacation after II year II Semester examination and it will be evaluated in III Year II semester. The Industrial internship report shall be submitted in a report form and presented before the committee. It shall be evaluated for 50 marks. The committee consists of head of the department, and internship supervisor and a senior faculty member of the department. There shall be no external marks for internship.

5.9 There shall be an industry-oriented Mini-Project, in collaboration with an industry of their specialization, to be taken up during the vacation after III year II Semester examination. However, the mini-project and its report shall be evaluated along with the project work in IV year II Semester. The industry oriented mini-project shall be submitted in a report form and presented before the committee. It shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of the mini-project and a senior faculty member of the department. There shall be no internal marks for industry-oriented mini-project.

5.10 There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding of the topic, and submit it to the department. It shall be evaluated by the departmental committee consisting of head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for the seminar.

5.11 There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is intended to assess the student's understanding of the subjects he studied during the B. Tech. course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

5.12 Out of a total of 200 marks for the project work, 50 marks shall be allotted for Internal Evaluation and 150 marks for the End Semester Examination (50 marks for thesis, 50 marks for successful execution of the project and 50 marks for Viva Voce). The End Semester Examination of the project work shall be conducted by the same committee as appointed for the industry-oriented mini-project. In addition, the project supervisor shall also be included in the committee. The topics for Comprehensive Assignment, Industrial Internship, industry oriented mini project, and seminar and project work shall be different from one another. The evaluation of project work shall be made at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

5.13 The Laboratory marks and the sessional marks awarded by the examiners are subject to scrutiny and scaling by the college wherever necessary. In such cases, the sessional and laboratory marks awarded by the examiners will be referred to a Committee. The Committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the Committee will be final and binding. The laboratory records and internal test papers shall be preserved and should be produced before the Committees as and when required.

6. Attendance Requirements

6.1 A student is eligible to write the End Semester examinations only if he acquires a minimum of 75% of attendance in aggregate of all the subjects.

6.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted by the College Academic Committee

6.3 Shortage of Attendance below 65% in aggregate shall not be condoned and student will be detained on account of shortage of attendance below 65%.

6.4 A student who is short of attendance in semester may seek re-admission into that semester when offered within 4 weeks from the date of the commencement of class work.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to write their end semester examination of that class and their registration stands cancelled.

6.6 A stipulated fee shall be payable towards condonation of shortage of attendance.

6.7 A student will be promoted to the next semester if he satisfies the attendance requirement of the present semester, as applicable, including the days of attendance in sports, games, NCC and NSS activities.

6.8 If any candidate fulfills the attendance requirement in the present semester, he shall not be eligible for readmission into the same class.

7. Minimum Academic Requirements

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6.

7.1 A student is deemed to have satisfied the minimum academic requirements if he/she has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the end semester exam, and minimum 40% of marks in the sum total of the mid-term and end semester exams.

7.2 A student shall be promoted from first year to second year if he fulfills the minimum attendance requirement.

7.3 A student will not be promoted from II year to III year unless he fulfills the academic requirement of 40 credits up to II year II semester or 30 credits up to II year I semester from all the examinations, whether or not the candidate takes the examinations.

7.4 A student shall be promoted from III year to IV year only if he fulfils the academic requirements of 60 credits up to III year II semester or 50 credits up to III year I semester from all the examinations, whether or not the candidate takes the examinations.

7.5 A student shall register and put up minimum attendance in all 213 credits and earn 206 credits. Marks obtained in the best 204 credits shall be considered for the calculation of percentage of marks.

7.6 Students who fail to earn 206 credits as indicated in the course structure within ten academic years (8 years of study + 2 years additionally for appearing for exams only) from the year of their admission, shall forfeit their seat in B.Tech. Course and their admission stands cancelled.

8 Course Pattern

8.1 The entire course of study is for four academic years. I , II, III and IV years shall be on semester pattern.

8.2 A student, eligible to appear for the end examination in a subject, but absent from it or has failed in the end semester examination, may write the exam in that subject during the period of supplementary exams.

8.3 When a student is detained for lack of credits/shortage of attendance, he may be re-admitted into the next semester. However, the academic regulations under which he was first admitted shall continue to be applicable to him.

9 Award of Class

After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

Class Awarded	% of marks to be secured	From the aggregate marks secured from **204** Credits.
First Class with Distinction	70% and above	
First Class	Below 70 but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

The marks obtained in internal evaluation and end semester examination shall be shown separately in the memorandum of marks.

10 Minimum Instruction Days

The minimum instruction days for each semester shall be 90 days. Tentatative Schedule must be as per the pattern given below.

	Instructions Days	16 Weeks
First Semester	Instructions Days	16 Weeks
	Mid Term Examinations	2 Weeks
	Preparation & Practical Examinations	2Weeks
	End Examinations	2Weeks
Semester Break		2Weeks
Second Semester	Instructions Days	16 Weeks
	Mid Term Examinations	2 Weeks
	Preparation & Practical Examinations	2Weeks
	End Examinations	2Weeks
Summer Break		6 weeks

11. Branch Transfer of students
There shall be no branch transfers after the completion of the admission process.

12. Transfer of students from other colleges/universities
Transfer of students from the Constituent Colleges of *JNTUH* or from other Colleges/Universities shall be considered only on a case-to-case basis by the Academic Council of the Institute while following rules as in the force at that time promulgated by JNTUH and State government of Telangana.

13. Withholding Of Results

If the student has not paid the dues, if any, to the college or if any case of indiscipline is pending against him, the result of the student will be withheld and he will not be allowed into the next semester. His degree will be withheld in such cases.

14. Transitory regulations

14.1 Discontinued, detained, or failed candidates are eligible for readmission, as and when next offered.

14.2 After the revision of the regulations, the students of the previous batches will be given two chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

14.3 In case of transferred students from other Universities and colleges, the credits shall be transferred to JBIET as per the academic regulations and course structure of the JBIET.

15.   General

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

15.2   The academic regulation should be read as a whole for the purpose of any interpretation.

15.3   In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Principal is final.

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

15.5   The students seeking transfer to JBIET from various other Universities/ Institutions have to pass the failed subjects which are equivalent to the subjects of JBIET, and also pass the subjects of JBIET which the candidates have not studied at the earlier Institution on their own without the right to sessional marks. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of JBIET, the candidates have to study those subjects in JBIET in spite of the fact that those subjects are repeated.

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ACADEMIC REGULATIONS R14 FOR B. TECH. (LATERAL ENTRY SCHEME)

Applicable for the students admitted into II year B. Tech. (LES) from the Academic Year 2014-15 and onwards

1   Eligibility for award of B. Tech. Degree (LES)

1.1 The LES candidates shall pursue a course of study for not less than three academic years and not more than six academic years.

1.2 They shall be permitted to write the examinations for two more years after six academic years of course work.

1.3 The candidate shall register for 163 credits and secure 156 credits from II to IV year B.Tech. Program (LES) for the award of B.Tech. degree with compulsory subjects as listed in Table-2.

Table-2	
Serial Number	Subject Particulars
1	All practical subjects
2	Industry oriented mini project
3	Comprehensive Assignment
4	Industrial Internship
5	Comprehensive Viva-Voce
6	Seminar
7	Project work

1.4 The students, who fail to fulfil the requirement for the award of the degree in 8 consecutive academic years (6 years of study + 2 years additionally for appearing exams only) from the year of admission, shall forfeit their seats.

1.5 The attendance regulations of B. Tech. (Regular) shall be applicable to B.Tech. (LES).

2.   Promotion Rule

A student shall be promoted from second year to third year if he fulfills the minimum attendance requirement.

A student shall be promoted from III year to IV year only if he fulfils the academic requirements of 40 credits up to III year II semester or 30 credits up to III year I semester from all the examinations, whether or not the candidate takes the examinations.

3.   Award of Class

After a student has satisfied the requirement prescribed for the completion of the program and is eligible for the award of B. Tech. Degree, he shall be placed in one of the following four classes:

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for 154 Credits. (i.e. II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

The marks obtained in the internal evaluation and the end semester examination shall be shown separately in the marks memorandum.

4. All other regulations as applicable to **B. Tech. 4-year degree course (Regular) will hold good for B. Tech. (Lateral Entry Scheme)**.

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that Subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled and kept with the examination branch.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated,

		shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the

	or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the Examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the

		subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators
1.   Punishments to the candidates as per the above guidelines.
2.   Punishment for invigilators : (if the squad reports that the invigilator is also involved in encouraging malpractices)
            (i)   A show cause notice shall be issued to the invigilator.
            (ii)   Impose a suitable fine on the invigilator.

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INFORMATION TECHNOLOGY

COURSE STRUCTURE – R14

I B.Tech – I Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C110A	English	3	0-0-0	3
2	C110B	Mathematics - I	4	1-0-0	4
3	C110C	Engineering Physics	3	1-0-0	3
4	C115A	Computer Programming	3	1-0-0	3
5	C113F	Engineering Drawing - I	1	0-0-3	3
6	C1101	Computer Programming Lab	0	0-3-0	2
7	C1102	Engineering Physics Lab	0	0-3-0	2
8	C1104	Engineering Workshop	0	0-3-0	2
9	C1105	English Lab	0	0-3-0	2
		Total	**14**	**3-12-3**	**24**

I B.Tech – II Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C120A	Technical English	3	0-0-0	3
2	C120B	Mathematics - II	4	1-0-0	4
3	C120D	Engineering Chemistry	3	0-0-0	3
4	C125A	Data Structures	3	1-0-0	3
5	C120F	Professional Ethics	3	0-0-0	3
6	C120E	Mathematical Methods	4	1-0-0	4
7	C1201	Data Structures Lab	0	0-3-0	2
8	C1203	Engineering Chemistry Lab	0	0-3-0	2
9	C1204	IT Workshop	0	0-3-0	2
		Total	**20**	**3-9-0**	**26**

II B.Tech – I Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C210A	Probability and Statistics	3	1-0-0	3
2	C216A	Mathematical Foundations of Computer Science	3	1-0-0	3
3	C215A	Advanced Programming in C++ and Java	4	1-0-0	4
4	C210B	Environmental Studies	3	0-0-0	3
5	C212C	Basic Electrical Engineering	4	0-0-0	4
6	C214C	Electronic Devices and Circuits	4	0-0-0	4
7	C2105	Electronic Devices and Circuits Lab	0	0-3-0	2
8	C2112	Basic Electrical Engineering Lab	0	0-3-0	2
9	C2113	Advanced Programming Lab	0	0-3-0	2
		Total	**21**	**3-9-0**	**27**

II B.Tech – II Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C226C	Digital Logic Design & Computer Organization	3	1-0-0	3
2	C225A	Database Management Systems	4	0-0-0	4
3	C226A	OOPS Through PYTHON	4	1-0-0	4
4	C225B	Operating Systems	4	0-0-0	4
5	C226B	Design and Analysis of Algorithms	3	1-0-0	3
6	C2224	OOPS Through PYTHON Lab	0	0-3-0	2
7	C2225	Operating Systems Lab	0	0-3-0	2
8	C2226	Database Management Systems Lab	0	0-3-0	2
9	C2227	Comprehensive Assignment	0	0-0-0	2
10	C2228	Gender Sensitization	0	0-3-0	2
		Total	**18**	**3-12-0**	**28**

III B.Tech – I Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C316A	Automata and Compiler Design	3	1-0-0	3
2	**OPEN ELECTIVE**		3	0-0-0	3
	C316O	Intellectual Property Rights			
	C316P	Disaster Management			
	C313Q	Operation Research			
	C316Q	Cyber Laws			
3	C316B	Software Engineering	3	0-0-0	3
4	C316C	Data Communication and Computer Networks	4	0-0-0	4
5	C315B	Web Technologies	4	1-0-0	4
6	C315E	Linux programming	4	1-0-0	4
7	C3115	Computer Networks Lab	0	0-3-0	2
8	C3116	Web Technologies Lab	0	0-3-0	2
9	C3117	Linux Programming Lab	0	0-3-0	2
		Total	**21**	**3-9-0**	**27**

III B.Tech – II Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C326A	Principles of Programming Languages	3	1-0-0	3
2	C325D	Data Warehousing and Data Mining	4	1-0-0	4
3	C326B	Software Testing Methodologies	4	0-0-0	4
4	**ELECTIVE - I:**		3	0-0-0	3
	C326C	Adhoc Sensor Networks			
	C326D	Storage Area Networks			
	C326E	Middleware Technologies			
	C326F	Web Services			
5	C326G	Object Oriented Analysis and Design	4	1-0-0	4
6	C3219	Data Warehousing and Data Mining Lab	0	0-3-0	2
7	C3220	Software Testing Lab	0	0-3-0	2
8	C3221	Case Tools Lab	0	0-3-0	2
9	C3222	Industrial Internship	0	0-0-0	2
		Total	**18**	**3-9-0**	**26**

IV B.Tech – I Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C415A	Information Security	4	0-0-0	4
2	C416A	Information Retrieval Systems	3	1-0-0	3
3	C416B	Mobile Application Development	4	1-0-0	4
4		**ELECTIVE - II:**	3	0-0-0	3
	C416C	Wireless Networks and Mobile Computing			
	C416D	Software Architecture and Design Pattern			
	C415H	Semantic Web and Social Networks			
	C416E	Soft Computing			
5		**ELECTIVE - III:**	3	0-0-0	3
	C416F	Software Project Management			
	C416G	Scripting Languages			
	C416H	Computer Forensics			
	C415G	Computer Graphics			
6	C416I	Embedded Systems	4	1-0-0	4
7	C4116	Mobile Application Development Lab	0	0-3-0	2
8	C4117	Embedded Systems Lab	0	0-3-0	2
9	C4418	Soft Skills Lab - I	0	0-3-0	2
		Total	**21**	**3-9-0**	**27**

IV B.Tech – II Semester

Sl. No	Code	Subject	L	T-P-D	C
1	C420A	Management Science for Engineers	4	0-0-0	4
2		**ELECTIVE – IV:**	3	1-0-0	3
	C425A	Cloud Computing			
	C425B	Enterprise Computing			
	C426A	Advanced Mobile Computing			
	C426B	Visual Programming Techniques			
3		**ELECTIVE - V:**	3	1-0-0	3
	C425C	Big Data Analytics			
	C426C	Internet of Things			
	C426D	Cyber Security			
	C425D	Machine Learning			
4	C4226	Soft skills Lab -II	0	0-3-0	2
5	C4227	Industry Oriented Mini Project	0	0-0-0	2
6	C4228	Seminar	0	0-6-0	2
7	C4229	Project Work	0	0-15-0	10
8	C4230	Comprehensive Viva	0	0-0-0	2
		Total	**10**	**2-24-0**	**28**

Note: All End Examinations (Theory and Practical) are of three hours duration.

T – Tutorial, L – Theory, P – Practical, D – Drawing, C – Credits.

Total No of Credits = 213

B.Tech. IT	L	T-P-D	C
I Year - I Semester	3	0-0-0	3

ENGLISH
(Common to all branches)

UNIT - I:
-Word Formation-Word Disintegration.
-Root/Base Word- Word Origin.
-Affixation-Prefix & Suffix.
-Synonym/Antonym-Homophone/Homonym/Homograph.
Use of Dictionary &Thesaurus.
-Phrasal Verbs, Idioms.
-One Word Substitutes.
-Collocations.
-Technical Vocabulary.

UNIT - II:
Grammar
-Parts of Speech- Introduction to English Grammar
-All about- Noun, Pronoun, Verb, Adverb
- Adjective, Preposition, Conjunction, Interjection
- Articles- Use of Articles A, An and The.
-Punctuations.

Tenses
-Tenses in English.
-Use of appropriate Tenses in different contexts.
-Use of Tenses in Narration.

UNIT - III:
Improving Reading Skills
-Reading for Specific Purposes.
-Reading for General Information.
-Reading for facts.
-Reading between/beyond the lines.
-Reading for Skimming & Scanning.
-Dialogue Reading.
-Comprehension.

UNIT - IV:
Basics of Writing
-Syntax & Sentence Structure.
-Construction of Proper Sentences in English.
-Sentences Types- Purposes.
-Email Etiquette.
-Note Making and Note Taking.

UNIT - IV:

 Common Errors in English

       -Subject-Verb Agreement.

TEXT BOOK :

1. **Language In Use - Intermediate: Self-Study Workbook with Answer Key/2008** Adrian Doff, PB Cambridge University Press.
2. **English Vocabulary in Use: Pre-Intermediate & Intermediate** (PB +CD ROM)/3rd Edition Stuart Redman Cambridge University Press.

REFERENCE BOOKS:

1. **Technical Communication: Principles And Practice** (With Dvd) 2nd Edition (English) 2nd Edition Sangeeta Sharma, Meenakshi Raman, Oxford Univesity Press
2. **The Fundamental Aspects of Communication Skills**/2009,Dr.P. Prasad, S.K Kataria & Sons **Active Grammar with Answer Level 1,2 &3** Davis Cambridge University Press

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B.Tech. IT	L	T-P-D	C
I Year - I Semester	**4**	**1-0-0**	**4**

MATHEMATICS – I
(Common to all branches)

UNIT - I:
Sequences – Series
 Basic definitions of Sequences and Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence.
Function of Single Variable
Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized mean value theorem (all theorems without proof).

UNIT - II:
Function of Several Variables
 Functional dependence – Jacobian – Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT - III:
Curve Tracing: Cartesian, polar and parametric curves.
Geometrical applications of Differential Calculus: Radius of Curvature, Centre and Circle of Curvature-Evolutes and Envelopes

UNIT - IV:
Multiple Integrals: Double and triple integrals – change of order of integration – change of variable.

UNIT - V:
Vector Calculus: Gradient-Divergence-Curl and their related properties, Potential function – Laplacian and second order operators. Line integral – work done – surface integrals-Flux of a vector valued functions.
Vector integrals theorem: Green's –Stoke's and Gauss's Divergence Theorems (Statement & their verification).

TEXT BOOK:
1. **Grewal B.S, "Higher Engineering Mathematics"**, Khanna publications, 42nd edition 2012
2. **Advanced Engineering Mathematics** by Jain and S.R.K. Iyangar, Narosa Publications.

REFERENCE BOOKS:
1. **Engineering Mathematics** by B.V.Ramana, Tata McGrawhill Publishing company Ltd .New Delhi, 5th edition, 2011.
2. **Engineering Mathematics-I** by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand
3. **Engineering Mathematics-I** by G.Shankar Rao, I.K.International Publications.

B.Tech. IT   **L**   **T-P-D**   **C**

I Year - I Semester   **3**   **1-0-0**   **3**

ENGINEERING PHYSICS
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I

Crystallography

Space Lattice**,** Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Packing Factor of SC, BCC, FCC, Diamond Structures, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of Orthogonal Crystal Systems.

XRD &its applications: Basic Principles of XRD, Bragg's Law, X-Ray diffraction Methods: Laue Method, Powder Method, XRD its Applications.

UNIT - II

Defects in solids:

Vacancies, Substitution, Interstitial, Concentration of Frenkel and Schottky Defects, line defects (Qualitative) & Burger's Vector

Principles of Quantum Mechanics:

Waves and Particles, de Broglie Hypothesis , Matter Waves, G.P.Thomson , Davisson and Germer's Experiment, Heisenberg uncertainty principle, Schrödinger's Time Independent Wave Equation – Physical Significance of the Wave Function – Particle in a One-Dimensional potential well(Zero point energy).

UNIT - III

Dielectric Properties:

Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities(Electronic and Ionic): Internal Fields in Solids, Clausius -Mossotti Equation, Ferro- electricity,piezo and Pyro Electricity, Its applications.

Magnetic Properties:

Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magnetron, Classification of magnetic materials, Properties of Anti-Ferro and Ferri Magnetic Materials and their Applications ,Explanation of Hysteresis curve on the basis of Domain Theory of Ferro magnetism, soft and Hard Magnetic Materials.

UNIT - IV

Superconductivity:

Concept of superconductivity, Properties of Superconductors, Type-I and Type-II superconductor, BCS Theory, Applications of Superconductors.

Semiconductor Physics:

Fermi Level in Intrinsic and Extrinsic Semiconductors, Calculation of carrier concentration in Intrinsic &, Extrinsic Semiconductors, Hall Effect and its Applications.

UNIT - V

Lasers:

Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Einstein's Coefficients and Relation between them, Population Inversion, Lasing Action, Ruby Laser, Helium-Neon Laser, Semiconductor laser, Applications of Lasers

Optical fiber:

Principle of Optical Fiber, Construction of optical fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers: Step Index and Graded Index Fibers, Attenuation in Optical Fibers, Application of Optical Fiber in communication systems.

TEXT BOOKS:
1. **Applied Physics – P.K.Mittal** (I.K.Internationalhosesepvt Ltd) (New Edition)
2. **Enginnering Physics** - P.K Palaniswamy (Scitech Publications India) Pvt Ltd, Fifth Print 2010)

REFERENCE BOOKS:
1. **Engineering Physics** - Senthilkumar ((Vrb Publishers Limited)
2. **Applied Physics for Engineers** – A.J. Dekker (Macmillan).
3. **Introduction to Solid State Physics** – C. Kittel (Wiley Eastern).

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**3**	**1-0-0**	**3**

COMPUTER PROGRAMMING
(Common to all branches)

UNIT - I:

Computer fundamentals-Hardware, software, computer language, translators, Compiler, Interpreter, Loader, and linker, Program Development steps-Algorithms, Pseudo code, flow charts, Specification for Converting Algorithms into Programs basic,

Introduction to C Language – History, Simple C Program, Structure of a C Program, Identifiers, Basic data types, user defined data types, Variables, Constants, type qualifiers, Managing Input / Output, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

UNIT - II:

Selection Statements – if and switch statements, Repetitive statements – while, for, do-while statements, C Programming examples, other statements related to looping – break, continue, go to, C Programming examples. Arrays– Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples.

UNIT - III:

Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication, Standard functions, Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.

Strings – Basic concepts, String Input / Output functions, arrays of strings, string handling functions, strings to functions, C programming examples.

UNIT - IV:

Derived types – Structures – Basic concepts, nested structures, arrays of structures, structures and functions, unions, bit fields, C programming examples.
Pointers – Basic concepts, pointers and functions, pointers and strings, pointers and arrays, pointers and structures, self-referential structures, example C programs.

UNIT - V:

Introduction Using Files in C, Declaration of File Pointer, Opening a File, Closing and Flushing Files, Working with Text Files, Character Input and Output, End of File (EOF)
Working with Binary Files, Direct File Input and Output, Sequential Versus Random File Access, Files of Records, working with Files of Records, Random Access to Files of Records, Other File Management Functions, Deleting a File Renaming a File.

TEXT BOOKS:
   1. **Programming in C.** P. Dey and M Ghosh, Oxford University Press.
   2. **The C Programming Language**, by Brian W. Kernighan , Dennis M. Ritchie
REFERENCE BOOKS:
   1. **C programming** A Problem-Solving Approach by Behrouz A.Forouzan
   2. **Programming with C**, B.Gottfried, 3rd edition, Schaum's outlines, TMH.
   3. **Graphics Under C** by Yashavant Kanetkar, BPB Publications, 2003

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B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**1**	**0-0-3**	**3**

ENGINEERING DRAWING - I
(Common to all branches)

UNIT - I

INTRODUCTION TO ENGINEERING DRAWING:

Principles of Engineering Drawing and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions.
SCALES:
Different types of Scales, Plain scales, Vernier Scale, Digonal Scale, Scales of chords.

UNIT - II

CONSTRUCTION OF CURVES USED IN ENGINEERING PRACTICE:

a) Conic Sections Ellipse- General, Concxentric Circle, Arcs of circle and Oblong Method Parabola- General, Tangent and Rectangle Methods Hyperabola-General, Point/Rectangle Method
b) Cycloid, Epicycloid and Hypocycloid
c) Involute for Circle, Rectangle and Triangle

UNIT - III
PROJECTIONS OF POINTS AND LINES:
Principles of Orthographic Projections – Conventions – First and Third Angle, Projections of Points and Lines inclined to planes, True lengths, traces.

UNIT - IV
PROJECTIONS OF PLANES:
Projections of regular Planes, auxiliary planes and Auxiliary projection inclined to both planes.

UNIT - V
PROJECTIONS OF SOLIDS:
Projections of Regular Solids inclined to both planes – Auxiliary Views.

TEXT BOOKS:
1. **Engineering Drawing,** N.D. Bhat / Charotar
2. **Engineering Drawing and Graphics**, Venugopal / New age.

REFERENCE BOOKS:
1. **Engineering Drawing** – Basant Agrawal, TMH
2. **Engineering drawing** – P.J. Shah.S.Chand.
3. **Engineering Drawing**, Narayana and Kannaiah / Scitech publishers.

B.Tech. IT		L	T-P-D	C
I Year - I Semester		0	0-3-0	2

COMPUTER PROGRAMMING LAB
(Common to all branches)

EXPERIMENT-I:

Simple C programs -to implement basic arithmetic operations – sum, average, product, smallest, largest of the numbers, difference, quotient and remainder of given numbers etc.

EXPERIMENT - II:

Programs on if, else-if, nested if, else if ladder - largest and smallest of given numbers, to find the grade of a student based on marks, roots of a quadratic equation etc.

EXPERIMENT - III:

a. Programs on switch-case – to check the type of a given character, to find the grade of a student etc.
b. Programs on while and do-while- to find factorial, Fibonacci series, GCD, Sin(x), Cos(x) series, to check whether a given number is an Armstrong, Palindrome, Perfect, number conversion, and Prime number etc.

EXPERIMENT - IV:

Programs on "for loop" - sum of n natural numbers, factorial, sin(x), to generate Pascal's triangle etc.

EXPERIMENT - V:

a. Programs on nested loops – check for Fibonacci prime, Pyramids of numbers, generation of prime numbers in the given range, multiplication table etc.
b. Programs using break, go to, and continue.

EXPERIMENT - VI:

a. Programs on 1-D array-finding Minimum and maximum element, Sorting and Searching etc.
b. Programs on 2-D array – Sum, product and Multiplication of two Matrices etc.

EXPERIMENT - VII:

a. Programs on Functions-Implementation of user defined functions categories, passing of arrays to functions etc.
b. Programs on recursion - factorial of a given integer, GCD of two given integers etc.

EXPERIMENT - VIII:

a. Programs on String handling functions-Copying, reverse, substring, concatenation.
b. Programs on structure and unions.

EXPERIMENT - IX:
Programs using pointers- pointer basic operations, pointers and functions etc.

EXPERIMENT - X:
Programs on pointers and structures, Pointers and arrays, pointers and strings.

EXPERIMENT - XI:
Programs on files-Implementation of file handling functions. Programs on files error handling. Programs on Dynamic memory allocation.

EXPERIMENT - XII:
Programs on command line arguments. Programs on preprocessor directives.

EXPERIMENT - XIII:
Program draws basic shapes such as circle, line, rectangle, ellipse and display text on screen using c graphics. Smiling face Animation using c graphics displaying face at random position on screen.

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I Year - I Semester	**0**	**0-3-0**	**2**

ENGINEERING PHYSICS LAB
(Common to ECE,EEE,CSE,IT,ECM)

COURSE OBJECTIVES:

To develop a good experiment skills so as to apply theoretical knowledge in the experimental verification

Minimum ten Experiments out of Twelve

List of Experiments:

EXPERIMENT-I: Torsional pendulum.

EXPERIMENT-II: Melde's experiment – Transverse and longitudinal modes.

EXPERIMENT-III: Time constant of an R-C circuit.

EXPERIMENT-IV: L-C-R circuit.

EXPERIMENT-V: Magnetic field along the axis of current carrying coil – Stewart and Gees method.

EXPERIMENT-VI: Study the characteristics of LASER sources.

EXPERIMENT-VII: Study the characteristics of light emitting diode.

EXPERIMENT-VIII: Evaluation of numerical aperture of given fiber.

EXPERIMENT-IX: Bending losses in optical fiber.

EXPERIMENT-X: Energy gap of a material of p-n junction.

EXPERIMENT-XI: Impedance Analysis/Dielectric constant of Measurements of materials.

EXPERIMENT-XII: Analysis of XRD spectra.

B.Tech. IT	**L**	**T-P-D**	**C**
I Year - I Semester	**0**	**0-3-0**	**2**

ENGINEERING WORKSHOP
(Common to all branches)

TRADES FOR EXPERIMENT

Three exercises from each trade

- **(i)** Carpentry
- **(ii)** Fitting
- **(iii)** Black Smithy
- **(iv)** Welding

TRADES FOR DEMONSTRATION & EXPOSURE

- **(i)** Power Tools in Construction, Wood working, Electrical Engineering works and Mechanical Engineering
- **(ii)** Plumbing

TEXT BOOKS:
1. **Work shop manual**-P.Kannaiah, K.Narayana, Scitech Publishers
2. **Workshop Manual**-Venkat Reddy

B.Tech. IT	L	T-P-D	C
I Year - I Semester	0	0-3-0	2

ENGLISH LAB
(Common to all branches)

MULTI-MEDIA LANGUAGE LAB

EXPERIMENT/ACTIVITY - I: Introduction to Phonetics

EXPERIMENT/ACTIVITY - II: Sounds of English- Vowels, Diphthongs

EXPERIMENT/ACTIVITY - III: Consonants

EXPERIMENT/ACTIVITY - IV: Introduction to Stress, Rhythm and Intonation

EXPERIMENT/ACTIVITY - V: Improving Listening Skills

ENGLISH COMMUNICATION SKILLS LAB

EXPERIMENT/ACTIVITY - VI: Self Introduction,

EXPERIMENT/ACTIVITY - VII: Introducing others

EXPERIMENT/ACTIVITY - VIII: Agreeing/Disagreeing and Asking Questions

EXPERIMENT/ACTIVITY - IX: 'Just A Minute' Sessions (JAM) & Situational Dialogues

EXPERIMENT/ACTIVITY - X: Describing Objects / Situations / People**.**

EXPERIMENT/ACTIVITY - XI: Oral Presentations- Prepared and Extempore**.**

EXPERIMENT/ACTIVITY - XII: Debate

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B.Tech. IT	L	T-P-D	C
I Year - II Semester	3	0-0-0	3

TECHNICAL ENGLISH
(Common to all branches)

UNIT - I:

Formal & Informal Writing
        -Formal & Informal Writing, Cover Letter.

UNIT - II:
Writing Techniques
        -Developing Paragraphs- Cohesion.
        -Developing passage by arranging paragraphs.

UNIT - III:

Official Correspondence
        - Types of Business Correspondence.
        -Technical Vocabulary, Report writing, Applications, Complaints & Requisitions.

UNIT - IV:
- e-Writing
        -e-Mail Etiquette.

UNIT - V:

Presentation Skills
        - Paper, Seminars, Conferences, Symposia, Workshop presentation.
        -Power Point Presentation (Microsoft Office Suit).
        -Project Proposal Presentation.

TEXT BOOKS:
  1. **Fundamentals of Technical Communications** - oxford – Meenakshi Raman, Sangeeta Sharma.
  2. **Strengthen Your Writing**- V.R. Narayanaswami -Orient Longman

REFERENCE BOOKS:

  1. **A Communicative Grammar of English**- Geoffrey Leech Jan Svartvik, Pearson Education.
  2. **Strengthen Your Steps**-Maruthi Publications, Hyderabad.

B.Tech. IT	L	T-P-D	C
I Year - II Semester	4	1-0-0	4

MATHEMATICS – II
(Common to all branches)

UNIT - I:
Differential equations of first order and their applications
Overview of differential equations – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.
Higher Order Linear differential equations and their applications
Linear differential equations of second and higher order with constant coefficients, RHS term of the $f(X)=e^{ax}$, Cosax, Sinax, x^n, $e^{ax} V(x)$, $x^n V(x)$ and method of variation of parameters. Applications on bending of beams, Electrical circuits, simple harmonic motion.

UNIT - II:
Laplace transform and its application to Ordinary differential equations
Laplace transform of standard functions – Inverse transform – first shifting theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem –Convolution theorem-Periodic function – differentiation and integration of transforms-Application of Laplace transforms to ordinary differential equations.

UNIT - III:
Fourier Series
Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval- even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT - IV:
Transforms
Fourier Transform: Fourier integral theorem – Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms, Parseval's formula.
Z-Transform: Z-Transform-Properties-Damping rule-shifting rule-Initial & Final value theorems-convolution theorem –solution of difference equations by Z-transform.

UNIT - V:
Partial differential equations
Introduction and Formation of partial equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations-Classification of PDE-Finite difference methods for: Elliptic, Hyperbolic & Parabolic equations-solution of Heat equation(one dimensional)

TEXT BOOKS:
   1. **Grewal B.S, "Higher Engineering Mathematics",** Khanna publications, 42nd edition 2012.
   2. **Advanced Engineering Mathematics** by Jain and S.R.K. Iyengar, Narosa Publications.

REFERENCE BOOKS:
   1. **Engineering Mathematics** by B.V.Ramana, Tata McGrawhill Publishing company Ltd .New Delhi, 5th edition, 2011.
   2. **Engineering Mathematics-I, Mathematical Methods** by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand.
   3. **Engineering Mathematics-I, Mathematical methods'** by G.Shankar Rao, I.K.International Publications.

B.Tech. IT	**L**	**T-P-D**	**C**
I Year - II Semester	**3**	**0-0-0**	**3**

ENGINEERING CHEMESTRY
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I:

Electrochemistry and Batteries:

Concept of Electrochemistry, Conductance-Electrolyte in solution, Conductance-Specific, Equivalent and molar conductance, Kolrausch's Law, application of conductance. EMF: Galvanic Cells, Reference Electrode, Nernst equation, galvanic series, Application of EMF measurements.

Batteries: Primary and secondary cells, (lead-Acid cell, Ni-Cd cell, Lithium cells). Application's of batteries. Fuel cells – Hydrogen – Oxygen fuel cells, advantages of fuel cells.

UNIT - II:

Polymers:

Introduction-classification-natural and synthetic polymers; Types of Polymerization (Chain growth & Step growth).Plastics: Thermoplastic & Thermoset resins. Engineering applications of: Teflon, Bakelite, Nylon. Conducting polymers- Poly acetylene, polyaniline- conduction, doping, and its application. Fibers – polyester, fiber reinforced plastics (FRP), applications.

UNIT - III:

Energy sources:

Introduction- fuels, classification – conventional fuels (solid, liquid, gaseous). Calorific value-HCV and LCV. Solid fuels – coal –processing of coal. Liquid fuels – primary – petroleum – refining of petroleum-cracking knocking synthetic petrol – Bergius and Fischer-tropsech's process.

UNIT - IV:

Water Technology:

Introduction, Hardness: Causes, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water. Boiler troubles – Scale & sludge formation, caustic embrittlement, corrosion, priming & foaming Softening of water (Internal & external treatment-Lime soda, Zeolites, Ion exchange process) Reverse osmosis, electro dialysis.

UNIT - V:

Photochemistry:

Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert- Beer Law. Photo processes - Internal Conversion, Inter-system crossing, Fluorescence, Phosphorescence.

Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-visible and IR spectroscopy – principles, instrumentation (Block diagram only).

Nanochemistry:

Introduction. Synthesis: Top down and bottom up processes, Properties and Applications and future prospects.

TEXT BOOKS:
1. Text Book of Engineering Chemistry – Shasi Chawla, Dhantpat Rai publishing Company, New Delhi (2008).
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).

REFERENCE BOOKS:
1. Text of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co,New Delhi(2006)
2. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited , New Delhi(2006)
3. 2Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills co., New Delhi (2004).

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I Year - II Semester	**3**	**1-0-0**	**3**

DATA STRUCTURES
(Common to all branches)

UNIT - I:

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT - II:

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation. Queues-operations, array and linked representations. Circular Queue operations, Dequeue, applications of queue.

UNIT - III:

Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals, AVL tree – operations, B-tree – operations.

UNIT - IV:

Graphs: Terminology, sequential and linked representation, graph traversals: Depth First Search & Breadth First Search implementation. Spanning trees, Prims and Kruskals method.

UNIT - V:

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

TEXT BOOKS:
1. **Data Structures Using C** Reema Thareja, Oxford University Press, 2011 Learning.
2. **Data Structures Using C** (Paperback) by Aaron M. Tenenbaum

REFERENCE BOOKS:
1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage.
2. **C& Data structures** – P. Padmanabham, Third Edition, B.S. Publications.
3. **Data Structures using C** – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education.

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I Year - II Semester	**3**	**0-0-0**	**3**

PROFESSIONAL ETHICS
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I :
Basic Concepts
Introduction, terminology, stake holders, governing edicts, contextual aspects, ethical dilemmas, life skills, emotional, intelligence, Indian and western thoughts on ethics, value education, dimensions of ethics, setting goals in life, importance of morality and ethics, basic ethical principles, moral developments theories, classification of ethical theories, some basic theories, moral issues, moral dilemmas autonomy.

UNIT - II :
Professional and professionalism
Introduction, meaning of profession, professionals, professionalism, professional association, professional's roles and professional risks, professional accountability, successful professional, ethics and profession, engineering profession, engineering as social experimentation, engineering professionals, engineering ethics, roles of engineers, balanced outlook on law, rights and responsibilities as citizens, professional responsibilities, professional rights.

UNIT - III :
Global issues and safety
Introduction, current scenario, business ethics, environmental ethics, computer ethics, media ethics, war ethics, bio-ethics, research ethics, intellectual property right, safety and risk, assessment of risk, risk and cost, engineers responsibility for safety, risk benefit, analysis, risk cause and management, case studies, providing for safe exit, ethical issues of safety.

UNIT - IV:
Ethical codes and audits
Introduction, need for ethical codes, sample codes, corporate codes, limitations of the codes, need for ethical audit, ethical profile of organizations, ethical standards and bench marketing, audit brief, ethical auditors, procedure for ethical audit, ethical audit report, examples.

UNIT - V:
Human values and ethical living
Introduction, terminology, domains of learning, human values, attitudes, values, attitudes and professionals, needs of life, harmony in life, what is ethical living, case studies.

TEXT BOOKS:
1. **Professional ethics** by R. Subramanian, Oxford press.
2. **Text book on Professional ethics** and human values by R.S.Nagarajan, New age international.

REFERENCE BOOKS:

1. **Professional ethics** and human value by D.R.Kiran, Tata McGraw Hills education.
2. **Ethics in engineering** by Mike W. Martin and Roland Schinzinger, Tata McGraw Hills education.
3. **Fundamental of Ethics** by Edmund G Seebauer and Robert L.Barry, Oxford university press.

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MATHEMATICAL METHODS
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I:
Solution of Algebraic and Transcendental Equations
Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton Raphson Method.
Interpolation:
Introduction – Errors in Polynomial Interpolation – Finite differences – Forward Difference – Backward difference – Central difference – Symbolic relations and separation of symbols – Difference Equations – Differences of polynomial – Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae – Interpolation with unevenly spaced points.

UNIT - II:
Solution for linear systems
Matrices and Linear systems of equations: Elementary row transformations- Rank-Echelon form, Normal forms–Existence of solution-Gauss elimination with pivoting-Gauss Jordan Method-Ill conditioned systems-Jacobi iterative method-Gauss seidal method-convergence of iterative methods.

UNIT - III:
Vector Spaces & Linear Transformatins
Vector Spaces: Vector Spaces- Linear independence- Basis & Dimensions- Linear transformation-Matrix linear transformation- permutations-inner product- orthogonal and – Orthonormal sets – Gram-Schmidt process.
Linear Transformations: Properties of Real & Complex Matrices, orthogonal matrices, Linear Transformation – Orthogonal Transformation. Eigen values and Eigen vectors of Real & complex matrices and their properties.

UNIT - IV:
Eigen Values & Eigen Vectors
Quadratic forms- Reduction of quadratic form to canonical form – Rank – Positive, Negative definite – semi definite – index – signature- Sylvester law, Singular value decomposition.
Eigen values, Eigen vectors – properties, Cayley-Hamilton – Theorem (with Proof) – Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonization of matrix. Calculation of powers of matrix – Model and spectral matrices.

UNIT - V:
Numerical Differentiation & Numerical solution of IVP's in ODE
Numerical Differentiation:
Derivatives using Forward, Backward & central difference formulae.

Numerical solution of IVP's in ODE:

Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations – Euler's Method- Runge-Kutta Methods –Predictor-Corrector Methods.

TEXT BOOKS:
1. **Grewal B.S, "Higher Engineering Mathematics**", Khanna publications, 42nd edition 2012
2. **Advanced Engineering Mathematics** by Jain and S.R.K. Iyangar, Narosa Publications.

REFERENCE BOOKS:
1. **Engineering Mathematics** by B.V.Ramana, Tata McGrawhill Publishing company Ltd. New Delhi, 5th edition, 2011.
2. **Engineering Mathematics-I** by T.K.V. Iyengar & B.Krishna Gandhi & Others, S.Chand
3. **Engineering Mathematics-I** by G.Shankar Rao, I.K.International Publications.

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DATA STRUCTURES LAB
(Common to all branches)

EXPERIMENT - I:

Write a C program that uses functions to perform the following operations on singly linked list:

I) Creation II) Insertion III) Deletion IV) Traversal V) merge two single linked lists.

EXPERIMENT - II:

Write a C program that uses functions to perform the following operations on doubly linked list.

EXPERIMENT - III:

Write a C program that uses functions to perform the following operations on circular linked list:

I) Creation II) Insertion III) Deletion IV) Traversal.

EXPERIMENT - IV:

Write C programs that implement stack operations using

I) Arrays   II) Linked Lists.

EXPERIMENT - V:

I) Write a program to convert infix expression to postfix expression using stack.

II) Write a program to evaluate postfix expression.

EXPERIMENT - VI:

I) Programs using recursion.

II)Write a program to convert infix expression to prefix expression using stack.

EXPERIMENT - VII:

Write a program to implement Linear queue using

I) Arrays   II) Linked Lists.

EXPERIMENT - VIII:

Write a program to perform following operations on a circular Queue

I) insertions II) deletions III) search and count.

EXPERIMENT - IX:

Write a program to perform following operations on a circular DeQueue

I) insertions II) deletions III) search and count

EXPERIMENT - X:

I) Write a program to implement Linear search

II) Write a program to implement Binary Search**.**

EXPERIMENT - XI:

Write C programs that implement the following sorting methods to sort a given list of
integers in ascending order:
I) Bubble sort II) Selection sort III) Insertion Sort

EXPERIMENT - XII:

Write C programs that implement the following sorting methods to sort a given list of
integers in ascending order:
I) Merge sort   II) Quick sort

EXPERIMENT - XIII:

Implementation of a binary tree representation using
I) Arrays   II) Linked Lists

EXPERIMENT - XIV:

1. Implementation of a Graph representation using Adjacency Matrix
2. Write a program to implement graph traversals.

TEXT BOOKS:

1. **C Programming & Data Structures**, B.A.Forouzan and R.F. Gilberg, Third Edition,
   Cengage Learning.
2. **Data Structures Using C** (Paperback) by Aaron M. Tenenbaum

REFERENCE BOOKS:

1. **C& Data structures** – P. Padmanabham, Third Edition, B.S. Publications.
2. **Data Structures using C** – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson
   Education / PHI
3. **C Programming & Data Structures**, E. Balagurusamy, TMH.

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ENGINEERING CHEMISTRY LAB
(Common to ECE,EEE,CSE,IT,ECM)

Introduction:
- Laboratory safety and precautions.
- Preparation of solution.
- Determination of unknown concentration of given solutions and calculations.

Titrimetry:
1. Estimation of hardness of water by EDTA method.

Mineral Analysis:

2. Determination of percentage purity of pyrolusite.

Instrumental Methods:

3. Conductometric titration of a)strong acid Vs strong base

   b) Weak acid vs strong base

   c) Mixture of acids vs strong base

4. Effect of dilution on conductance for i) Strong acids, ii) weak acids and iii) Ionic salts.

5. Determination of ferrous iron in cement by colorimetric method

6. Estimation of Copper by Colorimetric method.

Physical Properties:

7. Determination of viscosity of sample oil by Oswald's viscometer

8. Determination Surface Tension of given unknown liquid using stalganometer.

Preparations:

9. Preparation of organic compound Asprin.

Demonstration Experiments:

10. Preparation of Thiokol rubber.

TEXT BOOKS:
1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:
1. Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel.
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

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IT WORKSHOP
(Common to ECE,EEE,CSE,IT,ECM)

EXPERIMENT-I: Familiarizing with Computer Hardware
Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

EXPERIMENT-II: PC Assembly
Every student should disassemble and assemble the PC back to working condition. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

EXPERIMENT-III: Installation of Windows
Every student should individually install MS windows on the personal computer.

EXPERIMENT-IV: Installation of Linux
Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux.

EXPERIMENT-V: Hardware Troubleshooting:
Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition.

EXPERIMENT-VI: Software Troubleshooting:
Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition.

EXPERIMENT-VII: Networking Concepts
Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured

EXPERIMENT-VIII: Internet and Search Engines

Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google / yahoo / Bing. Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install antivirus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and / or worms.

EXPERIMENT-IX: Word Processor

The mentor needs to give an overview of Microsoft (MS) office / Libre Office tool - Overview of toolbars, saving files, Using help and resources, rulers, format painter. Overview of formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option, Inserting Table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes. Overview of Creating a Table of Content, Newspaper columns, Images from files and clipart. Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

EXPERIMENT-X: Spread Sheet

The mentor needs to tell the importance of MS Excel / Libre office Calc tool - teach toolbars, saving excel files, Using help and resources. Create employee payroll using functions. Other features to be covered are Cell Referencing, Charts, Renaming and Inserting worksheets, Hyper linking, LOOKUP/VLOOKUP, Sorting, Conditional formatting.

EXPERIMENT-XI: Presentation

The mentor needs to give overview of MS Power Point / Libre office Impress tool – to create basic power point presentation. PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows. Students need to create a PPT and present it.

EXPERIMENT-XII: Virtual Box Installation

Installing multiple operating systems on your PC using (virtual box) / hyper-v / VM Ware

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PROBABILITY AND STATISTICS
(Common to ECE,EEE,CSE,IT,ECM,MIE)

UNIT - I :
Probability
Review of Probability. Definitions of Random variables (Discrete and continuous).
Distributions
Binomial, Poisson & normal distributions related properties. Sampling distributions –Sampling distribution of means (σ known and Unknown).

UNIT - II:
Testing of Hypothesis
Testing of Hypothesis I: Tests of hypothesis point estimations – interval estimations. Large samples, Null hypothesis - Alternate hypothesis type I, & type II errors – critical region, confidence interval for mean testing of single variance. Difference between the mean.
Testing of Hypothesis II: Confidence interval for the proportions. Tests of hypothesis for proportions single and difference between the proportions.

UNIT - III :
Small samples
Confidence interval for the t- distribution – Tests of hypothesis – t - distributions, F- distributions, χ^2 distribution. Test of Hypothesis.

UNIT - IV:
Correlation & Regression: Coefficient of correlation – Regression Coefficient – The lines of regression – The rank correlation
Curve Fitting: Fitting of straight-second degree curve- exponential curve-power curve by method of Least squares.

UNIT - V:
Queuing Theory: Arrival Theorem - Pure Birth process and Death Process M/M/1 Model.
Time Series Analysis: Time series – utility of time series analysis, components of time series. Preliminary adjustments before analyzing time series. Measurement of trend by the method of least squares, method of moments.

TEXT BOOKS:
1. Grewal B.S, "Higher Engineering Mathematics", Khanna publications, 42nd edition 2012
2. Advanced Engineering Mathematics by Jain and S.R.K. Iyangar, Narosa Publications.

REFERENCE BOOKS:
1. Engineering Mathematics by B.V.Ramana, Tata McGrawhill Publishing company Ltd. New Delhi, 5th edition, 2011.
2. Engineering Mathematics-I by T.K.V. Iyanar & B.Krishna Gandhi & Others, S.Chand
3. Engineering Mathematics-I by G.Shankar Rao, I.K.International Publications.

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MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE
(Common for CSE,IT)

UNIT - I:
Mathematical Logic

Statements and notations, Connectives, Well formed formulas, Truth Tables, tautology, equivalence implication, Normal forms, Quantifiers, universal quantifiers. Predicates: Predicative logic, Free & Bound variables, Rules of inference, Consistency, proof of contradiction, Automatic Theorem Proving.

UNIT - II:
Relations

Properties of Binary Relations, equivalence, transitive closure, compatibility and partial ordering relations, Lattices, Hasse diagram. Functions: Inverse Function Composition of functions, recursive Functions, Lattice and its Properties, Algebraic structures: Algebraic systems Examples and general properties, Semi groups and monads, groups sub groups' homomorphism, Isomorphism.

UNIT - III:
Elementary Combinatorics

Basis of counting, Combinations & Permutations, with repetitions, Constrained repetitions, Binomial Coefficients, Binomial Multinomial theorems, the principles of Inclusion – Exclusion. Pigeon hole principles and its application.

UNIT - IV:
Recurrence Relation

Generating Functions, Function of Sequences Calculating Coefficient of generating function, Recurrence relations, solving recurrence relation by substitution and Generating funds. Characteristics roots solution of In homogeneous Recurrence Relation.

UNIT - V:
Graph Theory

Representation of Graph, DFS, BFS, Spanning Trees, planar Graphs. Graph Theory and Applications, Basic Concepts Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers.

TEXT BOOKS:
1. **Elements of DISCRETE MATHEMATICS**- A computer Oriented Approach- C L Liu, D P Mohapatra. Third Edition, Tata McGraw Hill.
2. **Discrete Mathematics** by RK Bisht,HS Dhami, Oxford University Press.

REFERENCE BOOKS:

1. **Discrete Mathematics for Computer Scientists & Mathematicians**, J.L. Mott, A. Kandel, T.P. Baker, PHI.
2. **Discrete and Combinational Mathematics**- An Applied Introduction-5th Edition – Ralph. P.Grimaldi.Pearson Education
3. **Discrete Mathematics and its Applications**, Kenneth H. Rosen, Fifth Edition.TMH.

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ADVANCED PROGRAMMING IN C++ AND JAVA
(Common to CSE,IT)

UNIT - I:
C++ Overview- Concepts of Classes ,Objects, C++ Programming Structure, Constructors and destructors, parameter passing methods, method and Constructor Over Loading, Inline functions, static class members, this pointer, friend functions, Operator Overloading, Generic Programming- Function and class templates, I/O Streams.

UNIT - II:
Overview Of Java Language : Java History – Features of java, java Programming Structure, Java Tokens, Constants, Variables, Expressions, Overview of arrays and strings, Concept of Classes ,objects, accessing class members, constructors ,overloading of methods and constructors, This ,static members, String Buffer class, Wrapper classes, Command Line Arguments.

UNIT - III:
Inheritance and Interfaces: Defining a sub class, inheritance types, sub class constructor, Final, super, Runtime polymorphism in java, runtime polymorphism using virtual functions in C++. Abstract methods and classes, visibility control, Defining Interfaces, extending interfaces, implementing interfaces.
Packages: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, Exploring java.io, java.util.

UNIT - IV:
Exception Handling and Multithreaded Programming: Types of errors-Compile time and Run time errors, Exceptions, Types of Exceptions, Syntax of Exception handling code, Multiple catch statements, Using finally statement, Throwing our own exceptions.
Introduction to threads: Creating Threads, life cycle of a thread, Thread priority, synchronization, and daemon Threads.

UNIT - V:
Applet Programming: Introduction, how applet differ from applications, building applet code, applet life cycle**, passing** parameters to applets.
Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.
Swing - Introduction, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. **Object Oriented Programming with C++**, 6e, E Balagurusamy,Tata McGraw-Hill Education.
2. **Java: the complete reference**, 7th editon, Herbert schildt, TMH.

REFERENCE BOOKS:

1. **C++: The Complete Reference**, 5th Edition, Herbert schildt, TMH.
2. **Understanding OOP with Java**, updated edition, T. Budd, Pearson eduction.
3. **Object Oriented Programming with JAVA**, 4e, E Balagurusamy,Tata McGraw-Hill Education.

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ENVIRONMENTAL STUDIES
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I:
Ecosystems & Natural Resources, **Biodiversity:** Classification of Resources: Living and Non-Living resources, Renewable and Non-Renewable resources. Water resources: use and over utilization, Land resources, land degradation, Forest resources, Mineral resources uses & Exploitation Energy resources: growing energy needs, use of alternate energy sources. Concept of ecosystem, Classification of ecosystem, Functions of ecosystem, Food chains, Food webs and ecological pyramids, Flow of energy, Biogeochemical cycles, Biomagnifications, carrying capacity.

UNIT - II:
Species, Ecosystem Diversity, Hotspots, Value Of Biodiversity, Threats To Biodiversity, Conservation Of Biodiversity: In-Situ And Ex-Situ Conservation & Environmental Pollution And Control: Classification of pollutions and pollutants, causes, effects of water, air, noise pollution, Introduction to control technologies: Water (primary, secondary, tertiary), Air(particulate and gaseous emissions), Soil(conservation and remediation), Noise(controlling devices) Solid waste, (Municipal) types, collection and disposal methods, characteristics of e-waste & hazardous waste, biomedical waste management. Biological disasters, pandemic and epidemics, Biological warfare.

UNIT - III:
Global Environmental Problems And Global Efforts: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification, International conventions/protocols: Earth Summit, Kyoto Protocol and Montreal Protocol, green-belt-development, Concept of Green Building, Clean Development Mechanism (CDM). Biological disasters, pandemic and epidemics, Biological warfare.

UNIT - IV:
Environmental Impact Assessment (Eia) And Environmental Management Plan: definition of Impact, classification of impacts, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society, EIA guide lines as per ministry of environment & forest, impact assessment methodologies. Environmental Impact Statement (EIS). Environmental management plan (EMP).

UNIT - V:
Environmental Policy, Legislation, Rules And Regulations & Towards Sustainable Future: Concept of Sustainable Development, Threats to Sustainability, Strategies for achieving Sustainable development, Environmental Ethics, Environmental Economics, Concept of Green Computing, Green chemistry and low Carbon life styles.**:** National Environmental Policy,

Environmental Protection Act: Air (Prevention and control of pollution) Act-1981, Water (Prevention and control of pollution) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, solid waste (biomedical waste and hazardous waste)management and handling rules.

TEXT BOOKS:
1. **TEXT BOOK OF ENVIRONMENTAL Science and Technology** by M.Anji Reddy 2007
2. **Principles of Environmental Science and Engineering** by P.Venugopal Rao

REFERENCE BOOKS:
1. **Introduction to Environmental Studies** by K.Mukkanti
2. **Tata McgrawHill :** Introduction to Environmental Studies by Benny Joseph
3. **Environmental Studies** by Erach Bharucha 2005, University Grants Commission, University Press.

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BASIC ELECTRICAL ENGINEERING
(Common to CSE,IT,MIE)

UNIT - I:
Introduction to Electrical Circuits: ohm's law, basic circuit components, Kirchhoff's laws. Simple problems.
Network Analysis: Basic definitions, types of elements, types of sources, resistive networks, inductive networks, capacitive networks, series parallel circuits, star delta and delta star transformation. Network theorems- Superposition, Reciprocity Thevenins"s, Norton's, Maximum power transfer theorems and simple problems.

UNIT - II:
Alternating Quantities:
Principle of ac voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltage, form factor and peak factor, phasor representation of alternating quantities, the J operator and phasor algebra, analysis of ac circuits with single basic network element, single phase series circuits.

UNIT - III:
D.C Generators and D.C motors:
 Principle of operation of dc machines, types of D.C generators, e.m.f equation in D.C generator.
 Principle of operation of dc motors, types of D.C motors, losses and torque equation, losses and efficiency calculation in D.C generator.

UNIT - IV:
A.C. Machines :
Transformer- Principles of operation, Constructional Details, Ideal Transformer and Practical Transformer, Losses, Transformer Test, Efficiency and Regulation Calculations (All the above topics are only elementary treatment and simple problems). Three phase induction motor, principle of operation, slip and rotor frequency, torque (simple problems.

UNIT - V:
Basic Instruments:
Introduction, classification of instruments, operating principles, essential features of measuring instruments, Moving coil permanent magnet (PMMC) instruments, Moving Iron of Ammeters And Voltmeters (elementary Treatment only) Single phase dynamo wattmeter.

TEXT BOOKS:
1. **Basic Electrical & Electronics Engineering** by D.P.Kothari & I.J.Nagarath, TMH, 2013.
2. **Basic Electrical Engineering** - by M.S.Naidu and S. Kamakshiah – TMH.

REFERENCE BOOKS:

1. **Basic Electrical Engineering** - by T.K.Nagasarkar and M.S. Sukhija Oxford University Press.
2. **Electrical and Electronic Technology**-by Hughes – Pearson Education.
3. **Theory and Problems of Basic Electrical Engineering** by D.P.Kothari & I.J. Nagrath PHI.

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ELECTRONIC DEVICES AND CIRCUITS
(Common to ECE,EEE,CSE,IT,ECM)

UNIT - I:
P-N Junction Diode
Qualitative Theory of p-n Junction, p-n Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semi Conductor Diodes, Zener Diode Characteristics.

UNIT - II:
Special Purpose Electronic Devices
Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram) and Varactor Diode, Principle of Operation of Schottky Barrier Diode, SCR, and Semiconductor Photo Diode. Introduction to UJT and UJT characteristics
Diode Applications: The p-n junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π- Section Filters, Comparison of Filters, Voltage Regulation using Zener Diode.

UNIT - III:
Bipolar Junction Transistor
The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation , BJT Specifications.
Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in VBE and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability.

UNIT - IV:
Small Signal Low Frequency BJT Models
BJT Hybrid Model for CE, CB and CC Configuration, simplified H- parameter model Determination of h-parameters from Transistor Characteristics, Comparison of CB, CE, and CC Amplifier Configurations, Conversion of h-parameters CE to CB, CE to CC, vice versa.

UNIT - V:
Field Effect Transistor
The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, Biasing of FET, FET as Voltage Variable Resistor, Comparison of BJT and FET. The JFET Small Signal Model, Generalized FET amplifier,

common source Amplifier, common Gate Amplifier and common Drain Amplifier,
MOSFET: MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes.

TEXT BOOKS:
1. **Electronics Devices and Circuits** by David Bell Oxford press.
2. **Millman's Electronic Devices and Circuits** – J. Millman, C.C.Halkias, and Satyabrata Jit,2ed. 1998, TMH.

REFERENCE BOOKS:
1. **Electronic Devices and Circuits** – R.L. Boylestad and Louis Nashelsky, 9 ed., 2006, PEI/PHI.
2. **Integrated Electronics** – J. Millman and Christos C. Halkias, 1991 ed., 2008, TMH.
3. **Electronic Devices and Circuits** -¬ K. Lal Kishore, 2 ed., 2005, BSP.

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ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE,EEE,CSE,IT,ECM)
PART A: (Only for Viva-voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions) :

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Board s, PCB's.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, MOSFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of

   ➢ Multimeters (Analog and Digital).

   ➢ Function Generator.

   ➢ Regulated Power Supplies.

CRO.
PART B:
(For Laboratory Examination – Minimum of 10 experiments)
1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Input & Output Characteristics of Transistor in CB Configuration.
4. Input & Output Characteristics of Transistor in CE Configuration.
5. Half Wave Rectifier with & without filters.
6. Full Wave Rectifier with & without filters.
7. FET characteristics.
8. Measurement of h parameters of transistor in CB, CE, CC configurations.
9. Frequency Response of CC Amplifier.
10. Frequency Response of CE Amplifier.
11. Frequency Response of Common Source FET amplifier
12. SCR characteristics.
13. UJT Characteristics

PART C:

Equipment required for Laboratories:

1. Regulated Power supplies (RPS)   -   0-30 V
2. CRO's   -   0-20 MHz.
3. Function Generators   -   0-1 MHz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Ammeters (Analog or Digital)   - 0-20 μA, 0-50μA, 0-100μA, 0-200μA, 0-10 mA.
8. Voltmeters (Analog or Digital)   - 0-50V, 0-100V, 0-250V
9. Electronic Components   - Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs, FETs, LEDs, MOSFETs,diodes Ge& Si type, Transistors – npn,pnp type).

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BASIC ELECTRICAL ENGINEERING LAB
(Common to IT,CSE & Mining branches)

Any Ten of the experiments are required to be conducted as compulsory experiments :

1. Verification of Thevenin's and Nortan's theorem.
2. Verification of Maximum power transfer theorem.
3. Verification of Super position & Reciprocity theorem.
4. Swinburne's Test on D.C. Shunt machine.
5. Brake test on D.C. Shunt motor
6. Speed control of D.C. Shunt motor by

    a). Armature voltage control b). Field control
7. O.C. & S.C.Test on 1-Φ transformer
8. Break test on 3-phase induction motor.
9. Load test on DC series Generator.
10. Open circuit characteristics of DC shunt generator.
11. Separation of core losses of a single phase transformer.
12. Calibration and Testing of single phase energy Meter.

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ADVANCED PROGRAMMING LAB
(Common to CSE,IT)

EXPERIMENT - I:

a) Write a C++ program implement the concept of Class and Object.

b) Write a C++ program to find the Fibonacci sequence The first two values in the
   Sequence is 1 and 1.

EXPERIMENT - II:

a) Write a C++ program to implement method overloading and constructor overloading.

b) Write a C++ program to implement Friend function.

EXPERIMENT - III:

a) Write a C++ program to implement the concept of operator overloading(Unary and
    Binary operators).

b) Write a C++ program to implement the concept of types of Inheritance.

EXPERIMENT - IV:

a) Write a C++ program to implement the concept of Runtime polymorphism using
     virtual function.

b) Write a C++ program to implement the concept of Class and Function Template.

EXPERIMENT - V:

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

b) Java program that prompts the user for an integer and then prints out all prime numbers
    up to that integer.

EXPERIMENT - VI:

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

b) Write a Java program to multiply two given matrices.

c) Write a Java Program that reads a line of integers, and then displays each integer, and the
   sum of all the integers.

EXPERIMENT - VII:

a) Write a java program to implement concept of implementing Interfaces and Extending
   Interface.

b) Write a java program   to create user defined package and import it.

EXPERIMENT - VIII:

a) Write a program to implement Exception Handling Mechanism in C++ and Java.

b) Write a java program to create User defined Exception.

EXPERIMENT - IX:

   a) Write a java program to create Multiple threads using Thread Class and Runnable Interface.

   b) Write a java program to implement the concept of Thread Priorities.

EXPERIMENT - X:

   a) Develop an applet that displays a simple message.

   b) Write a java program to Handle Mouse and Keyboard Events.

EXPERIMENT - XI:

   a) Write a java program that simulates a traffic light. The program lets the user select one of three lights: red, yellow, or green. When a radio button is selected, the light is turned on, and only one light can be on at a time No light is on when the program start.

   b) Write a Java program that allows the user to draw lines, rectangles and ovals.

EXPERIMENT - XII:

   a) Write a java program to create an abstract class named Shape that contains an empty method named number Of Sides ( ). Provide three classes named trapezoid, Triangle and Hexagon such that each one of the classes extends the class Shape. Each one of the classes contains only the method number Of Sides ( ) that shows the number of sides in the given geometrical figures.

   b) Suppose that a table named Table.txt is stored in a text file. The first line in the file is the header, and the remaining lines correspond to rows in the table. The elements are separated by commas. Write a java program to display the table using table component.

TEXT BOOKS:

1. **Object Oriented Programming with C++**, 6e, E Balagurusamy ,Tata McGraw-Hill Education.
2. **Java: the complete reference**, 7th editon, Herbert schildt, TMH.

REFERENCE BOOKS:

1. **C++: The Complete Reference**, 5th Edition, Herbert schildt, TMH.
2. **Java How to Program**, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI.
3. **Programming with Java**, M.P.Bhave and S.A.Patekar, Pearson Education.

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DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION
(Common to CSE,IT)

UNIT - I:
Basic Structure of Computers
Computer Types, Functional units, Basic operational concepts, Bus structures, Software, Performance, multiprocessors and multi computers, Computer Generations. Data Representation: Binary numbers, Fixed Point Representation. Floating – Point Representation. Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes.

UNIT - II:
Digital Logic Circuits - I
Basic Logic Functions, Logic gates, universal logic gates, Minimization of Logic expressions. Flip-flops, Combinational Circuits. Digital Logic Circuits -II: Registers, Shift Registers, Binary counters, Decoders, Multiplexers, Programmable Logic Devices.

UNIT - III:
Computer Arithmetic
Algorithms for fixed point and floating point addition, subtraction, multiplication and division operations. Hardware Implementation of arithmetic and logic operations, High performance arithmetic. Instruction Set & Addressing: Memory Locations and Addresses, Machine addresses and sequencing, Various Addressing Modes, Instruction Formats, Basic Machine Instructions. IA-32 Pentium example.

UNIT - IV:
Processor Organization
Introduction to CPU, Register Transfers, Execution of Instructions, Multiple Bus Organization, Hardwired Control, Micro programmed Control Memory Organization: Concept of Memory, RAM, ROM memories, memory hierarchy, cache memories, virtual memory, secondary storage, memory management requirements.

UNIT - V:
Input / Output Organization
Introduction to I/O, Interrupts- Hardware, Enabling and disabling Interrupts, Device Control, Direct memory access, buses, interface circuits, standard I/O Interfaces.

TEXT BOOKS:

1. **Computer Organization** – Carl Hamacher, Zvonko Vranesic, Safwat Zaky, fifth edition, McGraw Hill.
2. **Computer Architecture and Organization**- An Integrated Approach, Miles Murdocca, Vincent Heuring, Second Edition, Wiley India.

REFERENCE BOOKS:

1. **Computer Systems Architecture** – M.Moris Mano, IIIrd Edition, Pearson.
2. **Computer Organization and Architecture** – William Stallings Sixth Edition, Pearson
3. **Digital Logic Design & Computer Organization** with Computer Architecture for Security-Nikrouz Faroughi, McGrawHill Education

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DATABASE MANAGEMENT SYSTEMS
(Common to CSE,IT)

UNIT - I:

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

ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model

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

UNIT - III:
Form of Basic SQL Query
-Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity‟s – AND, OR and NOT – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases.
Schema refinement
-Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – FORTH Normal Form.

UNIT - IV:
Transaction Concept
-Transaction State- Implementation of Atomicity and Durability – Concurrent – Executions – Serializability- Recoverability– Implementation of Isolation – Testing for serializability- Lock – Based Protocols – Timestamp Based Protocols- Validation- Based Protocols – Multiple Granularity.
Recovery and Atomicity
-Log – Based Recovery – Recovery with Concurrent Transactions – Buffer Management –

Failure with loss of nonvolatile storage-Advance Recovery systems- Remote Backup systems.

UNIT - V:

Data on External Storage

-File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning- Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Advanced Database Management System

Introduction to Distributed Database-Reference Architecture, fragmentation, Allocation, Joins

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

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

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OOPS THROUGH PYTHON
(Common to CSE,IT)

UNIT - I:
Programming paradigms; Structured programming vs object oriented programming, OOPs fundamentals- class, object, abstraction, , encapsulation, polymorphism, and inheritance; Introduction to Python Getting started to Python- an interpreted high level language, interactive mode and script mode. Variables, Expressions and Statements Values and types, Variables and keywords, statements, evaluating expressions, operators and operands, order of operations, composition. Functions function calls, type conversion, type coercion, pre-defined functions, composition, user define functions, flow of execution, passing parameters, function parameters and scope. Conditionals and recursion modulus operator, Boolean expression, logical operators, conditional execution, alternative execution, chained and nested conditionals, return statement; Recursion, infinite recursion.

UNIT - II:
Python data structures Strings Creating, initializing and accessing the elements; String operators, comparing strings using relational operators; String functions and methods. **Lists:** Concept of mutable lists, creating, initializing and accessing the elements, traversing, appending, updating and deleting elements; List operations; List functions and Methods, list parameters, nested lists, Matrices.

Dictionaries
Concept of key-value pair, creating, initializing and accessing the elements in a dictionary, dictionary operations traversing, appending, updating and deleting elements, Dictionary functions and methods.

Tuples
Mutability and tuples, Immutable concept, creating, initializing and accessing the elements in a tuple, Tuple functions.

UNIT - III:
Object oriented programming using Python: creating python classes, classes and objects: user defined compound types, attributes, instances as arguments, instances as return values, objects are mutable, copying; classes and functions: pure function, modifiers; Exceptions: raising exceptions, handling exceptions, exception hierarchy.

UNIT - IV:
Classes and methods: object oriented features, optional arguments, initialization method, operator overloading and polymorphism. Inheritance: Basic Inheritance: extending built-ins, overriding and super; Multiple inheritance: the diamond problem, different sets of arguments.

UNIT - V:
Files handling and Exceptions: Text files, writing variables, Directories, Pickling;
Database Programming in Python: Connection module, connect MySQL Data base, perform DDL, DML and DQL operations.

TEXT BOOKS:
1. **Python 3 Object Oriented Programming,** Dusty Phillips, Packet Publishing, 2010.
2. **Programming in Python 3** - A complete Introduction to the Python Language- Second Edition, Mark Summerfiels, Addison-Wesley 2010.

REFERENCE BOOKS:
1. **Programming Python- 4th Edition**, Mark Lutz, O'Reilly, 2011.
2. **Object-Oriented Programming in Python**, Michael H, Goldwasser, David Letscher, Pearson Prentice Hall, 2008.

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OPERATING SYSTEMS
(Common to CSE,IT,ECM)

UNIT - I:
Operating System Overview Overview of Computer Operating Systems, Operating System Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating System Structures, Operating System Services and Systems Calls, Operating Systems Generation.
Process Management: Process Concepts, Threads, Scheduling-Criteria, Algorithms Evaluation, Thread Scheduling.

UNIT - II:
Concurrency Process Synchronization, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization examples, Atomic Transactions.
Memory Management Swapping, Contiguous Memory Allocation, Paging, Page-Table Structure, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Frames Allocation, Thrashing.

UNIT - III:
Principles of Deadlock System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock. File System Interface, File Concepts, Access Methods and Directory Structure, File System Mounting, File Sharing and Protection.

UNIT - IV:
File System Implementation File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance. Case Studies: UNIX, Linux and Windows.
Mass Storage Overview Mass-Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Swap-Space Management, RAID Structure, Stable-Storage Implementation, Tertiary Storage Structure.

UNIT - V:
Protection Goals of Protection, Principles of Protection, Domain of Protection Access Matrix, Implementation of Access Matrix, Access Control, Revocation of Access Rights, Capability-Based Systems, Language-Based Protection.
Security Security Problem, Program Threats, System and Network Threats Cryptography as a Security Tool, User Authentication, Implementing Security Defenses, Firewalling to protect Systems and Networks, Computer-Security Classifications, Case Studies: UNIX, Linux and Windows.

Advanced Operating Systems Distributed Operating Systems, Multi-Processor Operating Systems, Real-Time Operating Systems and Mobile Operating Systems.

TEXT BOOKS:
1. **Operating System Concepts-Abraham Silberchatz**, Peter B. Galvin, Greg Gagne, 7th Edition, John Wiley.
2. **Operating Systems- A Concept based Approach**-D.M.Dhamdhere, 2nd Edition, TMH.

REFERENCE BOOKS:
1. **Principles of Operating Systems-Naresh Chauhan,** Oxford Higher Education.
2. **Operating System A Design Approach**-Crowley, TMH.
3. **Modern Operating Systems**-Andrew S Tanenbaum, 2nd Edition Pearson, PHI.

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DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE,IT,ECM)

UNIT - I:
Introduction
Algorithm, Pseudo Code for expressing Algorithms, Performance Analysis: Space Complexity, Time Complexity, asymptotic Notations: Big-oh Notation, Omega Notation, Theta Notation, Little-oh Notation. Disjoint Sets: Disjoint Set Operations, Union and Find Algorithms, Spanning Trees, Connected Components and Biconnected Components.

UNIT - II:
Divide and Conquer
General Method, Applications: Binary Search, Quick Sort, Merge Sort, Stassen's Matrix Multiplication.
Greedy Method
General Method Applications: Job Sequencing with Deadlines, 0/1 Knapsack Problem, Minimum Cost Spanning Trees: Prim's and Kruskal's Algorithms, Single Source Shortest Path Problem, Huffman Codes.

UNIT - III:
DynamicProgramming
General Method, Principle of Optimality, Applications: Multistage Graphs, Matrix Chain Multiplication, Optimal Binary Search Trees, 0/1 Knapsack Problem, All Pairs Shortest Path Problem, Travelling Sales Person Problem, Reliability Design.

UNIT - IV:
Backtracking
General Method, Applications: Nqueen Problem, Recursive Permutation Generator, Sum of Subsets Problem, Graph Coloring, Hamiltonian Cycles.

UNIT - V:
Branch and Bound
General Method, Applications: Travelling Sales Person Problem, 0/1 Knapsack Problem, LC Branch and Bound Solution, FIFO Branch and Bound Solution. NP-Hard and NP-Complete Problems: Basic Concepts, Non-Deterministic Algorithms, NP-Hard and NP-Complete Classes, Cook's Theorem.

TEXT BOOKS:
1. **Fundamentals of Computer Algorithms**-Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia Publications Pvt. Ltd.

2. **Introduction to Algorithms**-T.H.Cormen, C.E.Leiserso, R.L.Rivest and C.Stein, 2nd Edition, Pearson Education, PHI Pvt. Ltd.

REFERENCE BOOKS:
1. **Algorithm Design: Foundations**, Analysis and Internet Examples-M.T.Goodrich and R.Tomassia, John Wiley and Sons.
2. **Introduction to Design and Analysis** of Algorithms A strategic Approach-R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, Mc-Graw Hill.
3. **Design and analysis of Algorithms**-S. Sridhar, Oxford Higher Education.

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OOPS THROUGH PYTHON LAB
(Common to CSE,IT)

EXPERIMENT - I:
1. Write a python program to obtain user input data (int, float, string) and display.
2. Write a python program to find the roots of a quadratic equation
3. Write a python program to perform arithmetic operations (+, -, *, /, %) for given input values and printout the result values.

EXPERIMENT - II:
1. Write a python programs that use both recursive and non-recursive functions to find the factorial of a given integer
2. Operators and Operands in Python: (Arithmetic, relational and logical operators), operator precedence, Expressions and Statements.
3. (Assignment statement); Taking input (using raw input () and input ()) and displaying output (print statement); Putting Comments.

EXPERIMENT - III:
1. Write python programs to perform operation on Strings using following functions: len, capitalize, find, isalnum, isalpha, isdigit, lower, islower, isupper, upper, lstrip, rstrip, isspace, istitile, partition, replace, join, split, count, decode, encode, swapcase.
2. Enter the details of 5 students and display the details sequentially.

EXPERIMENT - IV:
1. Write python programs to perform List operators: (joining, list slices)
2. Write python programs to perform List functions: len, insert, append, extend, sort, remove, and reverse, pop.
3. Write python programs to check whether the string is palindrome or not?

EXPERIMENT - V:
1. Write python programs to perform Tuple functions: cmp(), len(), max(), min(), tuple()
2. Write python programs to check whether the word is present in the tuple or not?
3. Write python programs to Take a string as ("1234567890") and create a pair {(1,2),(3,4),(5,6),(7,8),(9,0)} using tuple.

EXPERIMENT - VI:
1. Write python programs to perform Dictionary functions & Methods: cmp, len, clear(), get(), has_key(), items(), keys(), update(), values() .
2. Write python programs to Create a list of animal using dictionary variable "animal" and find out if the specific animal present in the list or not?

EXPERIMENT - VII:
1. Write a python program to create a class, its objects and accessing attributes.
2. Create a Customer class and check the balance and withdraw and deposit some amount.

EXPERIMENT - VIII:
   Write a python script to implement exception handling.
1. Check whether the input no is integer or not.
2. Handel the exceptions that are come at the time of division.

EXPERIMENT -IX:
   Write a python script to perform inheritance.

EXPERIMENT - X:
   Write a python script to perform various FILE handling operations.
   Open, close, read, write, copy.

EXPERIMENT - XI:
1. Write a python script to connect to the database and perform DDL operations.
2. Create table, insert data into table and display the table data.

EXPERIMENT - XII:
   Write a python script to connect to the database and perform various DML and DQL operations.

REFERENCE BOOKS:
1. **Programming in Python 3**- A complete Introduction to the Python Language- Second Edition, Mark Summerfiels, Addison-Wesley 2010.
2. **Programming Python**- 4th Edition, Mark Lutz, O'Reilly, 2011.
3. **Object-Oriented Programming in Python**, Michael H, Goldwasser, David Letscher, Pearson Prentice Hall, 2008

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OPERATING SYSTEMS LAB
(Common to CSE,IT,ECM)

1. Simulate the following CPU scheduling algorithms

   a) Round Robin   b) SJF.

2. Simulate the following CPU Scheduling algorithms

   a) FCFS b) Priority.

3. Simulate all file allocation strategies.

   a) Sequential   b) Indexed c) Linked.

4. Simulate MVT and MFT.

5. Simulate the following File Organization Techniques

   a) Single level directory b) Two level.

6. Simulate the following File Organization Techniques

   a) Hierarchical b) DAG.

7. Simulate Disk scheduling algorithms

   a) FCFS b) SSTF c) SCAN d) C-SCAN e) LOOK.

8. Simulate Bankers Algorithm for Dead Lock Avoidance.

9. Simulate Bankers Algorithm for Dead Lock Prevention.

10. Simulate all page replacement algorithms

   a) FIFO   b) LRU   c) LFU Etc. …

11. Simulate Paging Technique of memory management.

12. Simulate on Allocation of Frames.

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DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE,IT)

Objective:
This lab enables the students to practice the concepts learnt in the subject DBMS by developing a database for an example company named "Roadway Travels" whose description is as follows. The student is expected to practice the designing, developing and querying a database in the context of example database "Roadway travels". Students are expected to use "Oracle" database. Roadway Travels "Roadway Travels" is in business since 1997 with several buses connecting different places in India. Its main office is located in Hyderabad.
The company wants to computerize its operations in the following areas:

- Reservations and Ticketing
- Cancellations Reservations & Cancellation: Reservations are directly handled by booking office. Reservations can be made 30 days in advance and tickets issued to passenger. One Passenger/person can book many tickets (to his/her family). Cancellations are also directly handed at the booking office. In the process of computerization of Roadway Travels you have to design and develop a Database which consists the data of Buses, Passengers, Tickets, and Reservation and cancellation details. You should also develop query's using SQL to retrieve the data from the database.

The above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships.
2. E-R Model.
3. Relational Model.
4. Normalization.
5. Creating the database.
6. Querying. Students are supposed to work on these steps EXPERIMENT wise and finally create a complete "Database System" to Roadway Travels.

Examples are given at every experiment for guidance to students.
Experiment - I:
E-R Model
Analyze the problem carefully and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc.
Identify the primary keys for all the entities. Identify the other keys like candidate keys, partial keys, if any.

Example: Entities:
1. BUS.
2. Ticket.
3. Passenger.

Relationships:

1. Reservation.
2. Cancellation.

PRIMARY KEY ATTRIBUTES:

1. Ticket ID (Ticket Entity).
2. Passport ID (Passenger Entity).
3. Bus_NO(Bus Entity).

Apart from the above mentioned entities you can identify more. The above mentioned are few.

Note:
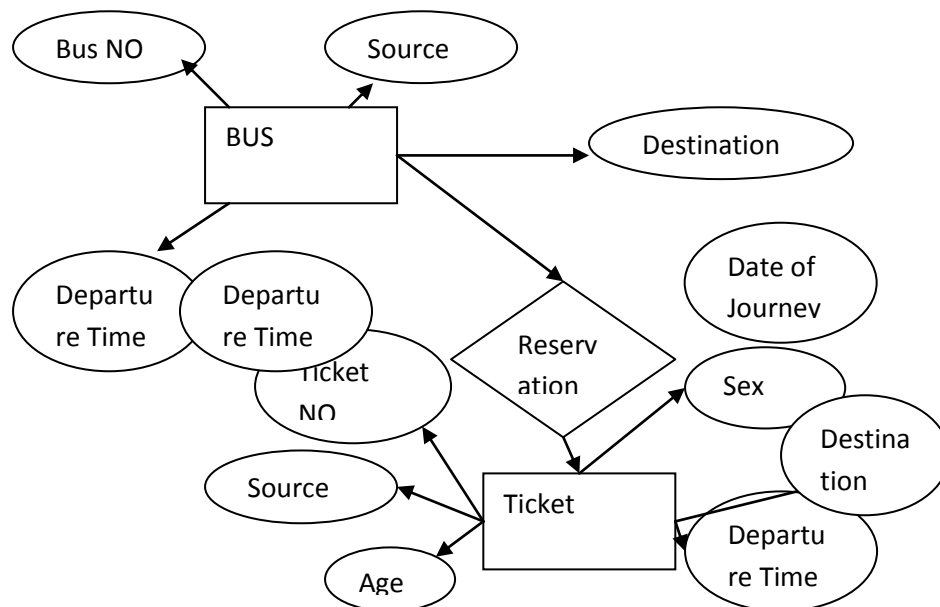The student is required to submit a document by writing the Entities and Keys to the lab teacher.

Experiment - II:
Concept design with E-R Model
Relate the entities appropriately. Apply cardinalities for each relationship. Identify strong entities and weak entities (if any). Indicate the type of relationships (total / partial). Try to incorporate generalization, aggregation, specialization etc wherever required.

Example:
E-R diagram for bus

Note: The student is required to submit a document by drawing the E-R Diagram to the lab teacher.

Experiment - III:
Relational Model
Represent all the entities (Strong, Weak) in tabular fashion. Represent relationships in a tabular fashion. There are different ways of representing relationships as tables based on the cardinality.

Represent attributes as columns in tables or as tables based on the requirement. Different types of attributes (Composite, Multi-valued, and Derived) have different way of representation.

Example:
The passenger tables look as below. This is an example. You can add more attributes based on your E-R model. This is not a normalized table.
Passenger

Name	Age	Sex	Address	Passport ID
			Ticket_id	

Note:
The student is required to submit a document by Represent relationships in a tabular fashion to the lab teacher.

Experiment - IV:

Normalization

Database normalization is a technique for designing relational database tables to minimize duplication of information and, in so doing, to safeguard the database against certain types of logical or structural problems, namely data anomalies. For example, when multiple instances of a given piece of information occur in a table, the possibility exists that these instances will not be kept consistent when the data within the table is updated, leading to a loss of data integrity. A table that is sufficiently normalized is less vulnerable to problems of this kind, because its structure reflects the basic assumptions for when multiple instances of the same information should be represented by a single instance only.

For the above table in the First normalization we can remove the multi valued attribute Ticket_id and place it in another table along with the primary key of passenger.

First Normal Form: The above table can be divided into two tables as shown below.
Passenger

Name	Age	Sex	Address	Passport ID

Passport ID	Ticket_id

You can do the second and third normal forms if required. Any how Normalized tables are given at the end.

Experiment - V:
Installation of Mysql and Practicing DDL and DML commands
Installation of MySql. In this EXPERIMENT you will learn Creating databases, How to create tables, altering the database, dropping tables and databases if not required. You will also try truncate, rename commands etc.

Example for creation of a normalized "Passenger" table.
CREATE TABLE Passenger (Passport_id   INTEGER   PRIMARY KEY,
   Name VARCHAR (50) Not NULL,
   Age   Integer Not NULL,
   Sex   Char,
   Address VARCHAR (50) Not NULL);

Similarly create all other tables.

Note: Detailed creation of tables is given at the end.
 Insert data into the above tables.

DML commands are used to for managing data within schema objects. Some examples:

- SELECT - retrieve data from the database.
- INSERT - insert data into a table.
- UPDATE - updates existing data within a table.
- DELETE - deletes all records from a table, the space for the records remain.

Inserting values into "Bus" table

Insert into Bus values (1234,'hyderabad', 'tirupathi');
Insert into Bus values (2345,'hyderabd','Banglore');
Insert into Bus values (23,'hyderabd','Kolkata');
Insert into Bus values (45,'Tirupathi,'Banglore');
Insert into Bus values (34,'hyderabd','Chennai');

Inserting values into "Passenger" table:

Insert into Passenger values (1, 45,'ramesh', 45,'M','abc123');
Insert into Passenger values (2, 78,'geetha', 36,'F','abc124');
Insert into Passenger values (45, 90,'ram', 30,'M','abc12');
Insert into Passenger values (67, 89,'ravi', 50,'M','abc14');
Insert into Passenger values (56, 22,'seetha', 32,'F','abc55');

Few more Examples of DML commands

Select * from Bus; (selects all the attributes and display)
UPDATE BUS SET Bus No = 1 WHERE BUS NO=2;

Experiment 6: Querying
In this EXPERIMENT you are going to practice queries (along with sub queries) using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, Constraints etc.

Practice the following Queries:

1. Display unique PNR_no of all passengers.
2. Display all the names of male passengers.
3. Display the ticket numbers and names of all the passengers.
4. Find the ticket numbers of the passengers whose name start with 'r' and ends with 'h'.
5. Find the names of passengers whose age is between 30 and 45.
6. Display all the passengers names beginning with 'A'
7. Display the sorted list of passengers names

Experiment - VII: Querying (continued...)

You are going to practice queries using Aggregate functions (COUNT, SUM, AVG, and MAX and MIN),

GROUP BY, HAVING and Creation and dropping of Views.

1. Write a Query to display the Information present in the Passenger and cancellation tables.
   Hint: Use UNION Operator.
2. Display the number of days in a EXPERIMENT on which the 9W01 bus is available.
3. Find number of tickets booked for each PNR_no using GROUP BY CLAUSE.
   Hint: Use GROUP BY on PNR_No.
4. Find the distinct PNR numbers that are present.
5. Find the number of tickets booked by a passenger where the number of seats is greater than 1.
   Hint: Use   GROUP BY, WHERE and HAVING CLAUSES.
6. Find the total number of cancelled seats.
7. Display the details of passengers who travelled within the last 3 months.
8. Create a view for the details of passengers who cancelled their tickets.

Experiment - VIII:
Create tables for the following schema. Student(snum: integer, sname: string, major: string, level: string, age: integer) Class(name: string, meets at: time, room: string, fid: integer) Enrolled(snum: integer, cname: string) Faculty(fid: integer, fname: string, deptid: integer)

Experiment - IX: Querying
1. Find the names of all Juniors (Level = JR) who are enrolled in a class taught by I. Teacher.

2. Find the age of the oldest student who is either a History major or is enrolled in a course taught by I. Teacher.
3. Find the names of all classes that either meet in room R128 or have 5 or more students enrolled.
4. Find the names of all students who are enrolled in two classes that meet at the same time.
5. Find the names of faculty members who teach in every room in which some class is taught.
6. Find the names of faculty members for whom the combined enrollment of the courses that they teach is less than 5.
7. Print the Level and the average age of students for that Level, for each Level.
8. Print the Level and the average age of students for that Level, for all Levels except JR. 9
9. Print the Level and the average age of students for that Level, whose average age is greater than 20.
10. Find the names of students who are enrolled in the maximum number of classes.
11. Find the names of students who are not enrolled in any class.
12. Count the number of junior level students.
13. Display all the students whose names start with the letter "p".
14. Display all the teachers whose names contain letter 'a' or 'I' in their names.

Experiment - X: PL/SQL Programs

1. Program to find sum of first 'n' natural no's
2. Program to find reverse of a number.
3. Insert the values of areas of a circle into a table called areas taking radius values from 2 to 8.

Experiment - XI: Cursors
In this EXPERIMENT you need to do the following: Declare a cursor that defines a result set. Open the cursor to establish the result set. Fetch the data into local variables as needed from the cursor, one row at a time. Close the cursor when done.

Practice the following programs using cursors.
1. Write a cursor program to retrieve the details of all students using cursors (Use students table in experiment 9)
2. Write a PL/SQL block to update the level of students from JL to "junior Level" and SL to "senior Level" and insert a record in new level table.
3. Write a cursor program to display the details of Senior Level students.

Experiment - XII: Procedures
In this session you are going to learn Creation of stored procedure, Execution of procedure and modification of procedure. Practice procedures using the above database.

Eg: CREATE PROCEDURE myProc()
BEGIN
SELECT COUNT(Tickets) FROM Ticket WHERE age>=40;
End;

Experiment - XIII: Triggers

In this EXPERIMENT you are going to work on Triggers. Creation of insert trigger, delete trigger, update trigger. Practice triggers using the above database.

Eg: **CREATE TRIGGER updcheck BEFORE UPDATE ON passenger**
    FOR EACH ROW
    BEGIN
    IF NEW.TickentNO > 60 THEN
    SET New.Tickent no = Ticket no;
    ELSESET New.Ticketno = 0;
    END IF;
    END;

REFERENCE BOOKS:
1. **Introduction to SQL**,Rick F.Vander Lans,Pearson education.
2. **Oracle PL/SQL Programming**,Steven Feuerstein,SPD.
3. **SQL & PL/SQL** for Oracle 10g,Black Book, Dr.P.S.Deshpande,Dream Tech.

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UGC AUTONOMOUS

B.Tech. IT	L	T-P-D	C
II Year - II Semester	0	0-3-0	2

GENDER SENSITIZATION
(Common to all branches)

UNIT - I:
Gender: Why should we study it?,
Socialization: Making women, Making Men, Introduction, Preparing For Womanhood, Growing up male, First lessons in caste, Different masculinities.

UNIT - II:
Housework : The Invisible Labour
"My mother does not work", "Share the load", Missing Women: Sex Selection and Its Consequences, Declining sex ratio, Demographic consequences, Point of view, Gender and the structure of knowledge, Further reading : Unacknowledged women artists of Telangana, Sexual Harassment: Say No! Sexual harassment, not eve-teasing, Coping with everyday harassment, Further reading. "Chupulu".

UNIT - III:
Women's Work: Its Politics and Economics,
Fact and fiction, Unrecognized and unaccounted work, Further reading: Wages and conditions of work, Domestic Violence: Speaking Out, Is home a safe place? When women unite [Film], Rebuilding lives, Further reading: New forums for justice.

UNIT - IV:
Whose History? Questions for Historians and Others,
Reclaiming a past, Writing other histories, further reading: Missing pages from modern Telangana history. Gender Spectrum: Beyond the Binary, Two or many?, Struggles with discrimination, Thinking about Sexual Violence, Blaming the victim, "I fought for my life…", Further reading: The caste face of violence.

UNIT - V:
Just Relationships: Being Together as Equals,Mary kom and Onler, Love and acid just do not mix, Love letters, Mothers and fathers, Further Reading: Rosa Parks – The brave heart.

TEXT BOOKS:
1. Towards a world of equals by A.Suneetha Susic Tharu publication Telugu academy Hyderabad.

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B.Tech. IT	**L**	**T-P-D**	**C**
III Year - I Semester	**3**	**1-0-0**	**3**

AUTOMATA AND COMPILER DESIGN

UNIT - I:
Formal Language and Regular Expressions: Languages, Definition Languages regular expressions, Finite Automata – DFA, NFA. Conversion of regular expression to NFA, NFA to DFA. Applications of Finite Automata to lexical analysis, lex tools.
Context Free grammars and top down parsing : Context free grammars, derivation, parse trees, ambiguity LL(K) grammars and LL(1) parsing.

UNIT - II:
Bottom up parsing: handle pruning LR Grammar Parsing, LALR parsing, parsing ambiguous grammars, YACC programming specification.
Semantics: Syntax directed translation, S-attributed and L-attributed grammars, Intermediate code – abstract syntax tree, translation of simple statements and control flow statements.

UNIT - III: Context Sensitive features – Chomsky hierarchy of languages and recognizers. Type checking, type conversions, equivalence of type expressions, overloading of functions and operations.

UNIT - IV:
Run time storage: Storage organization, storage allocation strategies scope access to now local names, parameters, language facilities for dynamics storage allocation.
Code optimization: Principal sources of optimization, optimization of basic blocks, peephole optimization, flow graphs, Data flow analysis of flow graphs.

UNIT - V:
Code generation: Machine dependent code generation, object code forms, generic code generation algorithm, Register allocation and assignment. Using DAG representation of Block.

TEXT BOOKS:
1. Introduction to Theory of computation.Sipser, 2nd Edition, Thomson.
2. Compilers Principles, Techniques and Tools Aho, Ullman, Ravisethi, Pearson Education.

REFERENCE BOOKS:
1. Modern Compiler Construction in C, Andrew W.Appel Cambridge University Press.
2. Compiler Construction, LOUDEN, Thomson.
3. Elements of Compiler Design, A. Meduna, Auerbach Publications, Taylor and Francis Group.

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B.Tech. IT   **L**   **T-P-D**   **C**

III Year - I Semester   **3**   **0-0-0**   **3**

INTELLECTUAL PROPERTY RIGHTS
OPEN ELECTIVE
(Common to CIVIL,CSE,IT,ECM)

UNIT - I:
Introduction to Intellectual property: Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT - II:
Trade Marks: Purpose and function of trade marks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT - III:
Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.
Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer

UNIT - IV:
Trade Secrets: Trade secrete law, determination of trade secrete status, liability for misappropriations of trade secrets, protection for submission, trade screte litigation.
Unfair competitiion: Misappropriation right of publicity, False advertising.

UNIT - V:
New development of intellectual property: new developments in trade mark law; copy right law, patent law, intellectual property audits.
International overview on intellectual property, international - trade mark law, copy right law, international patent law, international development in trade secrets law.

TEXT BOOKS:

1. Intellectual property right, Deborah, E. Bouchoux, cengage learning.
2. Intellectual property right - Unleashing the knowledge economy, prabuddha ganguli, Tata Mc Graw Hill Publishing Company Ltd.

REFERENCE BOOKS:
1. Managing Intellectual Property-The Strategic Imperative, Second Edition by Vinod V.Sople, PHI.
2. Intellectual Property –Copyrights, Trademarks and patents by Richard Stim, Cengage Learning.

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B.Tech. IT		L	T-P-D	C
III Year - I Semester		3	0-0-0	3

DISASTER MANAGEMENT
OPEN ELECTIVE
(Common to CSE,IT,ECM)

UNIT-I:
Introduction to Disasters; Examples; Information Availability, Causes of Information Unavailability, Measuring Information Availability, Consequences of Downtime; Failure Analysis, Single Point of Failure, Fault Tolerance, Multipathing Software.

UNIT-II:
Backup and Recovery: Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations, Backup Methods, Backup Process, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments, Backup Technologies.

UNIT-III:
Local Replication, Source and Target, Uses of Local Replica, Data Consistency, Local Replication Technologies, Restore and Restart Considerations Creating Multiple Replicas, Management Interface.
Remote Replication: Modes of Remote Replication, Remote Replication Technologies Network Infrastructure.

UNIT-IV:
Securing the Storage Infrastructure, Storage Security Framework, Risk Triad, Assets, Threats, Vulnerability. Storage Security Domains ,Securing the Application Access Domain, Securing the Management Access Domain , Securing Backup, Recovery, and Archive (BURA) , Security Implementations in Storage Networking SAN , NAS, IP SAN.

UNIT-V:
Monitoring the Storage Infrastructure: Parameters Monitored, Components Monitored , Monitoring Examples , Alerts, Storage Management Activities , Availability management , Capacity management , Performance management ,Security Management, Reporting , Storage Management Examples ,Storage Infrastructure Management Challenges ,Developing an Ideal Solution ,Storage Management Initiative , Enterprise Management Platforms.

TEXT BOOKS:
1. Information Storage and Management: Storing, Managing, and Protecting Digital Information**,** Ganesh Rajaratnam**,**EMC Education Services. Wiley Publications.
2. Executive Guide to Preventing Information Technology Disasters By Richard Ennals. Springer.

REFERENCES:
1. Information Management & Computer Security, Port Elizabeth Technikon, Port Elizabeth, MCB UP Ltd.
2. Information Security Management Systems, Godesberger Allee, BSI.

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B.Tech. IT	L	T-P-D	C
III Year - I Semester	3	0-0-0	3

OPERATIONS RESEARCH
OPEN ELECTIVE
(Common to CIVIL,CSE,IT)

UNIT – I

Introduction: Development – Definition– Characteristics and Phases – Types of operations. Research models – applications. Allocation: Linear Programming - Problem Formulation – Graphical solution – Simplex method – Artificial variables techniques Big-M method

UNIT – II

Transportation Problem: Formulation – Optimal solution - unbalanced transportation problem – Degeneracy. Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem- Traveling Salesman problem.
Sequencing: Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.

UNIT – III

Replacement: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, group replacement
Theory Of Games: Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – dominance principle – m X 2 & 2 X n games -graphical method..

UNIT – IV

Inventory: Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks – shortages are not allowed – Stochastic models – demand may be discrete variable or continuous variable – Instantaneous production. Instantaneous demand and continuous demand and no set up cost- Single period model
.
UNIT – V

Waiting Lines: Introduction – Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals
Simulation: Definition – Types of simulation models – phases of simulation– applications of simulation – Inventory and Queuing problems – Advantages and Disadvantages – Brief Introduction of Simulation Languages.

TEXT BOOKS:
1. Operations Research /J.K.Sharma 4e. /MacMilan
2. Operations Research / R.Pannerselvam 2e.,PHI Publications

REFERENCES :
1. Operations Research /A.M.Natarajan, P.Balasubramani, A. Tamilarasi/ Pearson Education.
2. Operations Research: Methods & Problems / Maurice Saseini, Arhur Yaspan & Lawrence Friedman
3. Introduction to O.R /Taha 8e/PHI

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III Year - I Semester   **3**   **0-0-0**   **3**

CYBER LAWS
OPEN ELECTIVE
(Common to IT,ECM)

UNIT- I
Introduction to Cyber Law, Evolution of Computer Technology, emergence of Cyber space.Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace-Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

UNIT-II
Information technology Act: Overview of IT Act, 2000, Amendments and Limitations of IT Act, Digital Signatures, Cryptographic Algorithm, Public Cryptography, Private Cryptography, Electronic Governance, Legal Recognition of Electronic Records, Legal Recognition of Digital Signature, Certifying Authorities, Cyber Crime and Offences, Network Service Providers Liability, Cyber Regulations Appellate Tribunal, Penalties and Adjudication.

UNIT III
Cyber law and related Legislation: Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution , Online Dispute Resolution (ODR).

UNIT IV
Electronic Business and legal issues: Evolution and development in E-commerce, paper versus paper less contracts E-Commerce models- B2B, B2C,E security.

UNIT V
Application area :business, taxation, electronic payments, supply chain, EDI, E-markets, Emerging Trends.

TEXT BOOKS:
1 Cyber Laws: Intellectual property & E Commerce, Security- Kumar K, dominant Publisher
2 Information Security policy &implementation Issues, NIIT, PHI

REFERENCE BOOKS:
1 .Cyber CRIME notorious Aspects of the Humans & net Criminals activity in Cyber World Barna Y Dayal D P Dominant Publisher
2. Cyber Crime Impact in the new millennium, Marine R.C. Auther press
3. Spam Attack, Cyber Stalking & abuse, Barna Y, Dayal D P Dominant publisher

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III Year - I Semester   **3**   **0-0-0**   **3**

SOFTWARE ENGINEERING
(Common to IT,ECM)

UNIT - I:

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.

A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.

UNIT - II:

Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.

System models : Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT - III:

Design Engineering: Design process and Design quality, Design concepts, the design model.

Creating an architectural design: Software architecture, Data design, Architectural styles and patterns, Architectural Design.

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.

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

UNIT - IV:

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

Metrics for Process and Products: Software Measurement, Metrics for software quality.

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

UNIT - V:

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

TEXT BOOKS :

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

REFERENCE BOOKS :

1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.
2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008
3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005

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B.Tech. IT   **L**   **T-P-D**   **C**

III Year - I Semester   **4**   **0-0-0**   **4**

DATA COMMUNICATION AND COMPUTER NETWORKS

UNIT - I:

Overview of the Internet: Protocol, Layering Scenario, TCP /IP Protocol Suite: The OSI Model, Internet history standards and administration; Comparison of the OSI and TCP/IP reference model.
Physical Layer: Guided transmission media, wireless transmission media.
Data Link Layer - design issues, CRC codes, Elementary Data Link Layer Protocols, sliding window protocol.

UNIT - II:
Multi Access Protocols - ALOHA, CSMA, Collision free protocols, Ethernet- Physical Layer, Ethernet Mac Sub layer, data link layer switching & use of bridges, learning bridges, spanning tree bridges, repeaters, hubs, bridges, switches, routers and gateways.

UNIT - III:
Network Layer: Network Layer Design issues, store and forward packet switching connection less and connection oriented networks-routing algorithms-optimality principle, shortest path, flooding, Distance Vector Routing, Control to Infinity Problem, Hierarchical Routing, Congestion control algorithms, admission control.

UNIT - IV:
Internetworking: Tunneling, Internetwork Routing, Packet fragmentation, IPv4, IPv6 Protocol, IP addresses, CIDR, IMCP, ARP, RARP, DHCP.

Transport Layer: Services provided to the upper layers elements of transport protocol-addressing connection establishment, connection release, Connection Release, Crash Recovery.

UNIT - V:
The Internet Transport Protocols UDP-RPC, Real Time Transport Protocols, The Internet Transport Protocols- Introduction to TCP, The TCP Service Model, The TCP Segment Header, The Connection Establishment, The TCP Connection Release, The TCP Connection Management Modeling, The TCP Sliding Window, The TCP Congestion Control, The future of TCP.
Application Layer- Introduction, providing services, Applications layer paradigms, Client server model, Standard client-server application-HTTP, FTP, electronic mail, TELNET, DNS, SSH.

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCES BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Edication.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.

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B.Tech. IT	**L**	**T-P-D**	**C**
III Year - I Semester	**4**	**1-0-0**	**4**

WEB TECHNOLOGIES
(Common to CSE,IT)

UNIT - I
Basic Tags of HTML, **I**ntroduction HTML5, new HTML5 Form input Types. Cascading Style Sheets.
Introduction to java script: declaring variables, functions, event handlers (onClick , onsubmit etc). Form validation.

UNIT - II
Introduction to XML: Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX. Introduction to web service solution stacks XAMPP: Introduction to content Management Systems Joomla, word press.

UNIT - III
Introduction to Servlets: Common Gateway Interface (CGI), Lifecycle of a Servlet, Deploying Servlet, Servlet API, Reading Servlet parameters, Reading initialization parameters, handling Http Request & Responses. Session tracking, cookies. Connecting to a database using JDBC.

UNIT - IV
Introduction to JSP: The anatomy of a JSp page, JSP processing, Declarations, Directives, Expressions, code snippets, implicit objects. Using beans in JSP pages. Using cookies for session tracking. Connecting to database in JSP.

UNIT - V
Introduction to PHP: Downloading, installing, configuring PHP, The anatomy of a PHP Page. Basic Security Guidelines, Variables, Data Types, Operators and Expressions, Constants, Flow Control Functions; Switching Flow, Loops, Code Blocks and Browser Output, Objects, Strings Processing, Form processing, Connecting to database, using cookies, dynamic contents.

TEXT BOOKS:

1. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book.
2. Dietel and Dietel : "Internet and World Wide Web - How to Program", 5th Edition, PHI/Pearson Education, 2011

REFERENCE BOOKS:

1. Chris Bates, "Web Programming, building internet applications", 2ndEdition, WILEY, Dreamtech, 2008.
2. Herbert Schildt, "The complete Reference Java 2", 8th Edition, TMH, 2011.
3. Hans Bergsten : "Java Server Pages", 3rdEdition, O'Reilly publication, 2008.

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III Year - I Semester   **4**   **1-0-0**   **4**

LINUX PROGRAMMING

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

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

UNIT - III
Files: File Concept, File System Structure, I-nodes, File Attributes, File types, Library functions, the standard I/O and formatted I/O in C, stream errors, kernel support for files, System calls, file descriptors, low level file access – File structure related system calls(File APIs), file and record locking, file and directory management – Directory file APIs, Symbolic links & hard links.
Process – Process concept, Kernel support for process, process attributes, process control - process creation, waiting for a process, process termination, zombie process, orphan process, Process APIs.

UNIT - IV
Signals– Introduction to signals, Signal generation and handling, Kernel support for signals, Signal function, unreliable signals, reliable signals, kill, raise , alarm, pause, abort, sleep functions.
Interprocess Communication: Introduction to IPC, Pipes and FIFOs, Introduction to three types of IPC-message queues, semaphores and shared memory.
Message Queues- Kernel support for messages, UNIX system V APIs for messages, client/server example.
Semaphores-Kernel support for semaphores, UNIX system V APIs for semaphores.
Shared Memory- Kernel support for shared memory, UNIX system V APIs for shared memory, semaphore and shared memory example.

UNIT -V

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

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

TEXT BOOKS:
1. Unix System Programming using C++, T.Chan, PHI.(UNIT III to UNIT VIII)
2. Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH.

REFERENCE BOOKS:

1. Beginning Linux Programming, 4th Edition, N.Matthew, R.Stones,Wrox, Wiley India Edition.
2. Linux System Programming, Robert Love, O'Reilly, SPD.
3. Advanced Programming in the Unix environment, 2nd Edition, W.R.Stevens, Pearson Education.

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III Year - I Semester   **0**   **0-3-0**   **2**

COMPUTER NETWORKS LAB
(Common to CSE,IT)

EXPERIMENT I:

Implement the data link layer framing methods such as character, character stuffing and bit stuffing.

EXPERIMENT II :

Implement on a data set of characters the three CRC polynomials - CRC 12, CRC 16 and CRC CCIP.

EXPERIMENT III:

Implement Dijkstra's algorithm to compute the shortest path through a graph.

EXPERIMENT IV:

Take an example subnet graph with weights indicating delay between nodes. Now obtain Routing table at each node using distance vector routing algorithm.

EXPERIMENT V:

Take an example subnet of hosts. Obtain broadcast tree for it.

EXPERIMENT VI:

Take a 64 bit playing text and encrypt the same using DES algorithm.

EXPERIMENT VII:

Write a program to break the above DES coding.

EXPERIMENT VIII:

Using RSA algorithm Encrypt a text data and Decrypt the same.

EXPERIMENT IX:

Implementation of Hamming Code.

EXPERIMENT X:

Simulation of Stop and wait protocol

EXPERIMENT XI:

Simulation of TCP client and server program

EXPERIMENT 12:

Using sniffing tool capture packets and analyze

TEXT BOOKS:

1. Data Communications and Networking - Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks - Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCES BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Edication.
2. Understanding communications and Networks, 3rd Edition, W. A. Shay, Cengage Learning.
3. Introduction to Computer Networks and Cyber Security, Chwan-Hwa (John) Wu, J. David Irwin, CRC Press.
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III Year - I Semester   **0**   **0-3-0**   **2**

WEB TECHNOLOGIES LAB
(Common to CSE,IT)

EXPERIMENT I:
Create   HOME PAGE for online book store

EXPERIMENT II:
Create login page for online book store.

EXPERIMENT III:
Create CATOLOGUE PAGE for online book store

EXPERIMENT IV:
Create registration form with the following fields Name , Password , confirm password, E-mail id,   Phone number, Sex, Date of birth, Address for online book store.

EXPERIMENT V:
Write JavaScript to validate the following fields of the above registration modify web page appearance using CSS.

EXPERIMENT VI:
Write an XML file which will display all your subjects Books information such as title, author, isbn , name of the publisher. Create a DTD, XML Schemas to   validate this XML document. Create CSS, XSL do display XML data.

EXPERIMENT VII:
Install XAMPP and JOOMLA or Word Press and test.

EXPERIMENT VIII:
Write Servlet Program to read data submitted from Registration form and store it into the MySql database.

EXPERIMENT IX:
Write a user validation web application to read username and password submitted by the user and return successful login if the data   matches, otherwise failure login.

EXPERIMENT X:
Write a PHP program to store current date-time in a COOKIE and display the "Last visited on" date-time on the web page upon reopening of the same page.

EXPERIMENT XI:
Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.

EXPERIMENT XII:
Using PHP and MySQL, develop a program to accept book information viz. Accession number,

title, authors, edition and publisher from a web page and   store the information in a database and to search for a book with the title specified by the user and to display the search results with proper headings.

TEXT BOOKS:

1. Web Technologies: HTML, JAVASCRIPT, PHP, JAVA, JSP, ASP.NET, XML and Ajax, Black Book
2. Dietel and Dietel : "Internet and World Wide Web - How to Program", 5th Edition, PHI/Pearson Education, 2011

REFERENCE BOOKS:

1. Chris Bates, "Web Programming, building internet applications", 2ndEdition, WILEY, Dreamtech, 2008.
2. Herbert Schildt, "The complete Reference Java 2", 8th Edition, TMH, 2011.
3. Hans Bergsten : "Java Server Pages", 3rdEdition, O'Reilly publication, 2008.

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LINUX PROGRAMMING LAB

Note: Use Bash for Shell scripts.

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

EXPERIMENT II:
a) Write a shell script that displays a list of all the files in the current directory to which the user has read, write and execute permissions.
b) Write a shell script that receives any number of file names as arguments checks if every argument supplied is a file or a directory and reports accordingly. Whenever the argument is a file, the number of lines on it is also reported.

EXPERIMENT III:
a) Write a shell script that accepts a list of file names as its arguments, counts and reports the occurrence of each word that is present in the first argument file on other argument files.
b) Write a shell script to list all of the directory files in a directory.

EXPERIMENT IV:
a) Write a shell script to find factorial of a given integer.
b) Write an awk script to count the number of lines in a file that do not contain vowels.

EXPERIMENT V:
a) Write an awk script to find the number of characters, words and lines in a file.
b) Write a c program that makes a copy of a file using standard I/O and system calls.

EXPERIMENT VI:
a) Implement in C the following Unix commands using System calls
    A . cat   B. ls   C. mv
b) Write a program that takes one or more file/directory names as command line input and reports the following information on the file.
    A. File type.   B. Number of links.
    C. Time of last access.   D. Read, Write and Execute permissions.

EXPERIMENT VII:
a) Write a C program to emulate the Unix ls –l command.
b) Write a C program to list for every file in a directory, its inode number and file name.

EXPERIMENT VIII:
   a) Write a C program that demonstrates redirection of standard output to a file.Ex: ls > f1.
   b) Write a C program to create a child process and allow the parent to display "parent" and the child to display "child" on the screen.

EXPERIMENT IX:
   a) Write a C program to create a Zombie process.
   b) Write a C program that illustrates how an orphan is created.

EXPERIMENT X:
   a) Write a C program that illustrates how to execute two commands concurrently with a command pipe. Ex:- ls –l | sort
   b) Write C programs that illustrate communication between two unrelated processes using named pipe.

EXPERIMENT XI:
   a) Write a C program to create a message queue with read and write permissions to write 3 messages to it with different priority numbers.
   b) Write a C program that receives the messages (from the above message queue as specified in (21)) and displays them.

EXPERIMENT XII:
   a) Write a C program to allow cooperating processes to lock a resource for exclusive use, using   a) Semaphores   b) flock or lockf system calls.
   b) Write a C program that illustrates suspending and resuming processes using signals.

EXPERIMENT XIII:
   a) Write a C program that implements a producer-consumer system with two processes. (Using Semaphores).
   b) Write client and server programs(using c) for interaction between server and client processes using Unix Domain sockets.

EXPERIMENT XIV:
1.   Write client and server programs(using c) for interaction between server and client processes using Internet Domain sockets.
2.   Write a C program that illustrates two processes communicating using shared memory.

TEXT BOOKS:

1. Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.
2. Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Cengage Learning.

REFERENCE BOOKS
1. Unix and Shell Programming, M.G. Venkatesh Murthy, Pearson Education, 2005.
2. Unix Shells by Example, 4th Edition, Elllie Quigley, Pearson Education.
3. Sed and Awk, O.Dougherty&A.Robbins,2nd edition,SPD

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PRINCLIPLES OF PROGRAMMING LANGUAGES

UNIT I :
Preliminary Concepts: Reasons for studying, concepts of programming languages, Programming domains, Language Evaluation Criteria, influences on Language design, Language categories, Programming Paradigms – Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation – Compilation and Virtual Machines, programming environments. Syntax and Semantics: general Problem of describing Syntax and Semantics, formal methods of describing syntax - BNF, EBNF for common programming languages features, parse trees, ambiguous grammars, attribute grammars, denotational semantics and axiomatic semantics for common programming language features.

UNIT II :
Data types: Introduction, primitive, character, user defined, array, associative, record, union, pointer and reference types, design and implementation uses related to these types. Names, Variable, concept of binding, type checking, strong typing, type compatibility, named constants, variable initialization. Expressions and Statements: Arithmetic relational and Boolean expressions, Short circuit evaluation mixed mode assignment, Assignment Statements, Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, guarded commands.

UNIT III :
Subprograms and Blocks: Fundamentals of sub-programs, Scope of life time of varaibles, static and dynamic scope, design issues of subprograms and operations, local referencing environments, parameter passing methods, overloaded sub-programs, generic sub-programs, parameters that are sub-program names, design issues for functions user defined overloaded operators, co routines.

UNIT IV :
Abstract Data types: Abstractions and encapsulation, introductions to data abstraction, design issues, language examples, C++ parameterized ADT, object oriented programming in small talk, C++, Java, C#, Ada 95. Concurrency: Subprogram level concurrency, semaphores, monitors, massage passing, Java threads, C# threads. Exception handling: Exceptions, exception Propagation, Exception handler in Ada, C++ and Java. Logic Programming Language: Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

UNIT V:
Functional Programming Languages: Introduction, fundamentals of FPL, LISP, ML, Haskell, application of Functional Programming Languages and comparison of functional and imperative Languages.

Scripting Language: Pragmatics, Key Concepts, Case Study: Python- Values and Types, Variables, Storage and Control, Bindings and Scope, Procedural Absraction, Separate Compilation, Module Library.

TEXT BOOKS:

1. Concepts of Programming Languages Robert .W. Sebesta 8/e, Pearson Education, 2008.
2. Programming Language Design Concepts, D. A. Watt, Wiley dreamtech, rp-2007.

REFERENCE BOOKS:

1. Programming Languages, 2nd Edition, A. B. Tucker, R. E. Noonan, TMH.
2. Programming Languages, K. C. Louden, 2nd Edition, Thomson, 2003.
3. LISP Patric Henry Winston and Paul Horn Pearson Education.

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DATA WAREHOUSING AND DATA MINING

UNIT I
Introduction: Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Data Mining Task Primitives, Integration of a Data Mining System with a Database or a Data Warehouse System, Major issues in Data Mining.
Data Preprocessing: Need for Preprocessing the Data, Data Cleaning, Data Integration and Transformation, Data Reduction, Discretization and Concept Hierarchy Generation.

UNIT II
Data Warehouse and OLAP Technology for Data Mining: Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Further Development of Data Cube Technology, From Data Warehousing to Data Mining
Data Cube Computation and Data Generalization: Efficient Methods for Data Cube Computation, Further Development of Data Cube and OLAP Technology, Attribute-Oriented Induction.
Mining Frequent Patterns, Associations and Correlations: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Mining various kinds of Association Rules, From Association Mining to Correlation Analysis, Constraint-Based Association Mining

UNIT III
Classification and Prediction: Issues Regarding Classification and Prediction, Classification by Decision Tree Induction, Bayesian Classification, Rule-Based Classification, Classification by Backpropagation, Support Vector Machines, Associative Classification, Lazy Learners, Other Classification Methods, Prediction, Accuracy and Error measures, Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods

UNIT IV
Cluster Analysis Introduction :Types of Data in Cluster Analysis, A Categorization of Major Clustering Methods, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data, Constraint-Based Cluster Analysis, Outlier Analysis.
Mining Streams, Time Series and Sequence Data: Mining Data Streams, Mining Time-Series Data, Mining Sequence Patterns in Transactional Databases, Mining Sequence Patterns in Biological Data, Graph Mining, Social Network Analysis and Multirelational Data Mining:

UNIT V
Mining Object, Spatial, Multimedia, Text and Web Data: Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Spatial Data Mining, Multimedia Data Mining, Text Mining, Mining the World Wide Web.

Applications and Trends in Data Mining: Data Mining Applications, Data Mining System Products and Research Prototypes, Additional Themes on Data Mining and Social Impacts of Data Mining.

TEXT BOOKS:

1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition, 2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

REFERENCE BOOKS:
1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining,K.P.Soman,S.Diwakar,V.Ajay,PHI,2008.

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SOFTWARE TESTING METHODOLOGIES

UNIT-I:
Introduction: Purpose of testing, Dichotomies, model for testing, consequences of bugs, taxonomy of bugs. Basics concepts of path testing, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, application of path testing.

UNIT-II:
Transaction Flow Testing: Transaction flows, transaction flow testing techniques. Dataflow testing:- Basics of dataflow testing, strategies in dataflow testing, application of dataflow testing. Domain Testing:-domains and paths, Nice & ugly domains, domain testing, domain and interface testing, domains and testability.

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

UNIT-IV:
Logic Based Testing: Overview, decision tables, path expressions, kv charts, specifications. State, State Graphs and Transition testing : State graphs, good & bad state graphs, state testing, Testability tips.

UNIT-V:
Graph Matrices and Application: Motivational overview, matrix of graph, relations, power of a matrix, node reduction algorithm, building tools.
 Regression testing, Rapid testing, Performance testing of a data base application and HTTP connection for website access.

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

REFERENCE BOOKS:
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD (Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.

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ADHOC SENSOR NETWORKS
ELECTIVE-I
(Common to CSE,IT,ECM)

UNIT-I: Introduction to Ad Hoc Wireless Networks

Cellular and Ad Hoc Wireless Networks, Characteristics of MANETs, Applications of MANETs, Issues and Challenges of MANETs. **Routing in MANETs:** Classification of Routing Protocols, Topology-based versus Position-based Approaches, Topology based Routing Protocols, Position based Routing, Other Routing Protocols.

UNIT-II: Data Transmission in MANETs

The Broadcast Storm, Multicasting, Geocasting, TCP over Ad Hoc Networks-TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc. **Security in MANETs:** Security in Ad Hoc Wireless Networks, Key Management, Secure Routing, Cooperation in MANETs, Intrusion Detection Systems.

UNIT-III: Basics of Wireless Sensors and Applications

The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications. Sensor Node Hardware

UNIT-IV: Data Retrieval in Sensor Networks

Classification of WSNs, MAC Layer, Routing Layer, High-Level Application Layer Support, Adapting to the Inherent Dynamic Nature of WSNs.

UNIT-V: Security in WSNs

Security in Wireless Sensor Networks, Key Management in Wireless Sensor Networks, Secure Data Aggregation in Wireless Sensor Networks, Introduction to Vehicular Ad Hoc Networks, Introduction to Wireless Mesh Networks

TEXT BOOKS:
1. Ad Hoc and Sensor Networks: Theory and Applications, Carlos de Morais Cordeiro and Dharma Prakash Agrawal, World Scientific Publications / Cambridge University Press, 2006.
2. Wireless Sensor Networks: An Information Processing Approach, Feng Zhao, Leonidas Guibas, Elsevier Science Imprint, Morgan Kauffman Publishers, 2005.

REFERENCE BOOKS:
1. Ad Hoc Wireless Networks: Architectures and Protocols, C. Siva Ram Murthy and B. S. Manoj, Pearson Education, 2004.
2. Guide to Wireless Ad Hoc Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition, 2011.
3. Guide to Wireless Sensor Networks, Sudip Misra, Isaac Woungang, and Subhas Chandra Misra, Springer International Edition, 2012.

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STORAGE AREA NETWORKS
ELECTIVE-I

UNIT I:
Introduction to Storage Technology: Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management, Solutions available for data storage, Core elements of a data center infrastructure, role of each element in supporting business activities.

UNIT II:
Storage Systems Architecture Hardware and software components of the host environment, Key protocols and concepts used by each component , Physical and logical components of a connectivity environment ,Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications, Concept of RAID and its components , Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems ,High-level architecture and working of an intelligent storage system.

UNIT III:
Introduction to Networked Storage: Evolution of networked storage, Architecture, components, and topologies of FC-
SAN, NAS, and IP-SAN, Benefits of the different networked storage options, understand the need for long-term archiving solutions and describe how CAS fulfills the need, understand the appropriateness of the different networked storage options for different application environments.

UNIT IV:
Information Availability & Monitoring & Managing Datacenter List reasons for planned/unplanned outages and the impact of downtime, Impact of downtime, Differentiate between business continuity (BC) and disaster recovery (DR) ,RTO and RPO, Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures , Architecture of backup/recovery and the different backup/recovery topologies , replication technologies and their role in ensuring information availability and business continuity, Remote replication technologies and their role in providing disaster recovery and business continuity capabilities. Identify key areas to monitor in a data center, Industry standards for data center monitoring and management, Key metrics to monitor for different components in a storage infrastructure, Key management tasks in a data center.

UNIT V:
Securing Storage and Storage Virtualization Information security, Critical security attributes for information systems, Storage security domains, List and analyzes the common threats in each domain, Virtualization technologies, block-level and file-level virtualization technologies and processes.

TEXT BOOKS:

1. EMC Corporation, Information Storage and Management, Wiley.
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.

REFERENCE BOOKS:

1. EMC Corporation, Information Storage and Management, Wiley,
2. Robert Spalding, "Storage Networks: The Complete Reference", Tata McGraw Hill, Osborne, 2003.
3. Marc Farley, "Building Storage Networks", Tata McGraw Hill, Osborne, 2001.

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MIDDLEWARE TECHNOLOGIES
ELECTIVE-I

UNIT I:

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

UNIT –II:

CORBA with Java:Distributed programming with Java RMI; Overview of CORBA, CORBA IDL, Client/server programming with CORBA & Java. XML Technology XML–Name Spaces–Structuring With Schemas and DTD-presentation Techniques–Transformation–XML Infrastructure.

UNIT-III:

SOAP: Overview of SOAP–HTTP–XML-RPC–SOAP: Protocol Message Structure–Intermediaries–Actors–Design Patterns And Faults–SOAP With Attachments. Web Services Overview–Architecture–KeyTechnologies-UDDI–WSDL–eb XML–SOAP and Web Services In E-Com–Overview Of .NET And J2EE.

UNIT-IV:

Agent and User Experience: Interacting with Agents-Agent From Direct Manipulation to Delegation-Interface Agent Metaphor with Character -Designing Agents-Direct Manipulation versus Agent Path to Predictable

.
UNIT V:

Agent Communication and Collaboration: Overview of Agent Oriented Programming -Agent Communication Language-Agent Based Framework of Interoperability -Agents for Information Gathering-Open Agent Architecture-Communicative Action for Artificial Agent. Agent Architecture Agents for Information Gathering Open Agent Architecture –Communicative Action for Artificial Agent.

TEXT BOOKS:
1. Frank. P. Coyle: XML, WebServices and The DataRevolution, 1st Edition, Pearson Education, 2002.
2. Jeffrey M. Bradshaw: Software Agents, 1st Edition, PHI, 2010.

REFERENCE BOOKS:
1. M.L.Liu: Distributed Computing, Principles and applications,1st Edition, Pearson Education, 2008.
2. Ramesh Nagappan, Robert Skoczylas and Rima Patel Sriganesh:Developing Java Web Services,1st Edition, Willey Publishing, 2004.

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WEB SERVICES
ELECTIVE-I

UNIT I

Evolution and Emergence of Web Services –Evolution of distributed computing. Core distributed computing technologies–client/server, CORBA, JAVA RMI, Micro Soft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA). Introduction to Web Services–The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

UNIT II

Web Service Architecture –Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication, basic steps of implementing web services. Describing Web Services – WSDL introduction, non functional service description, WSDL1.1 Vs WSDL 2.0, WSDL document, WSDL elements, WSDL binding, WSDL tools, WSDL port type, limitations of WSDL.

UNIT III:

Brief Over View of XML –XML Document structure, XML namespaces, Defining structure in XML documents, Reuse of XML schemes, Document navigation and transformation. SOAP : Simple Object Access Protocol, Inter-application communication and wire protocols, SOAP as a messaging protocol, Structure of a SOAP message, SOAP envelope, Encoding, Service Oriented Architectures, SOA revisited, Service roles in a SOA, Reliable messaging, The enterprise Service Bus, SOA Development Lifecycle, SOAP HTTP binding, SOAP communication model, Error handling in SOAP.

UNIT IV:

Registering and Discovering Services : The role of service registries, Service discovery, Universal Description, Discovery, and Integration, UDDI Architecture, UDDI Data Model, Interfaces, UDDI Implementation, UDDI with WSDL, UDDI specification, Service Addressing and Notification, Referencing and addressing Web Services, Web Services Notification.

UNIT V

SOA and web services security considerations, Network-level security mechanisms, Application-level security topologies, XML security standards, Semantics and Web Services, The semantic interoperability problem, The role of metadata, Service metadata, Overview of .NET and J2EE, SOA and Web Service Management, Managing Distributed System, Enterprise management Framework, Standard distributed management frameworks, Web service management, Richer schema languages, WS-Metadata Exchange.

TEXT BOOKS:
1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India
2. Web Services & SOA Principles and Technology, Second Edition, Michael P. Papazoglou.

REFERENCE BOOKS:
1. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
2. Building web Services with Java, 2 nd Edition, S. Graham and others, Pearson Education.
3. Java Web Services, D.A. Chappell & T. Jewell, O'Reilly, SPD.

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OBJECT ORIENTED ANALYSIS AND DESIGN
(Common to CSE,IT,ECM)

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

UNIT-II
Basic Structural Modeling: Classes, Relationships, common Mechanisms, and diagrams. Advanced Structural Modeling: Advanced classes, advanced relationships, Interfaces, Types and Roles, Packages. Class & Object Diagrams: Terms, concepts, modeling techniques for Class & Object Diagrams.

UNIT-III
Basic Behavioral Modeling-I: Interactions, Interaction diagrams.
Basic Behavioral Modeling-II: Use cases, Use case Diagrams, Activity Diagrams.

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

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

TEXTBOOKS
1. Grady Booch, James Rumbaugh, Ivar Jacobson : The Unified Modeling Language User Guide,PearsonEducation.
2. Hans-Erik Eriksson, Magnus Penker, Brian Lyons, David Fado: UML 2 Toolkit, WILEY-DreamtechIndiaPvt.Ltd.

REFERENCEBOOKS:
1. Meilir Page-Jones: Fundamentals of Object Oriented Design in UML, Pearson Education.
2. Pascal Roques: Modeling Software Systems Using UML2, WILEY- Dreamtech India Pvt. Ltd.
3. Atul Kahate: Object Oriented Analysis & Design, The McGraw-Hill Companies.

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DATA WAREHOUSING AND DATA MINING LAB

Credit Risk Assessment

Description: The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the banks profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit.
You can acquire such knowledge in a number of ways.

1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules.
2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form.
3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant.
 4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data:
Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data. (Down load from web) In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset

• DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter).

• owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones.
• foreign_worker. There are millions of these in Germany (many from Turrkey). It is very hard to get German citizenship if you were not born of German parents.

• There are 20 attributes used in judging a loan applicant. The goal is the classify the applicant into one of two categories, good or bad.

(Turn in your answers to the following tasks)

EXPERIMENT I: Study thoroughly the credit assessement problem.

EXPERIMENT II: List all the categorical (or nominal) attributes and the real-valued attributes separately.

EXPERIMENT III: What attributes do you think might be crucial in making the credit assessement? Come up with some simple rules in plain English using your selected attributes.

EXPERIMENT IV: One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training.

EXPERIMENT V: Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy?

EXPERIMENT VI: Is testing on the training set as you did above a good idea? Why orWhy not?

EXPERIMENT VII: One approach for solving the problem encountered in the previous question is using cross-validation? Describe what cross-validation is briefly. Train a Decistion Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why?

EXPERIMENT VIII: Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss.

EXPERIMENT IX: Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.)

EXPERIMENT X: Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)?

EXPERIMENT XI: Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model?

EXPERIMENT XII: You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase?

EXPERIMENT XIII: How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error).

EXPERIMENT XIV: Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR.

TEXT BOOKS:
1. Data Mining – Concepts and Techniques - Jiawei Han & Micheline Kamber, Morgan Kaufmann Publishers, Elsevier,2nd Edition, 2006.
2. Introduction to Data Mining – Pang-Ning Tan, Michael Steinbach and Vipin Kumar, Pearson education.

REFERENCE BOOKS:
1. Data Mining Techniques – Arun K Pujari,2nd edition, Universities Press.
2. Data Warehousing in the Real World – Sam Aanhory & Dennis Murray Pearson Edn Asia.
3. Insight into Data Mining, K.P.Soman, S.Diwakar, V.Ajay, PHI,2008.

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B.Tech. IT	L	T-P-D	C
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SOFTWARE TESTING LAB

EXPERIMENT I:
Write programs in „C" Language to demonstrate the working of the following constructs:
    i) do...while ii) while….do

EXPERIMENT II:
Write programs in „C" Language to demonstrate the working of the following constructs:
    i) if…else   ii) switch.   iii) for

EXPERIMENT III:
"A program written in „C" language for Matrix Multiplication fails" Introspect the causes for its failure and write down the possible reasons for its failure.

EXPERIMENT IV:
Take any system (e.g. ATM system) and study its system specifications and report the various bugs.

EXPERIMENT V:
Write the test cases for any known application (e.g. Banking application).

EXPERIMENT VI:
Create a test plan document for any application (e.g. Library Management System).

EXPERIMENT VII:
Study of Quick Test Professional for functional testing.

EXPERIMENT VIII:
Testing the performance of a webpage .

EXPERIMENT IX:
Study of any test management tool (e.g. Quality Center).

EXPERIMENT X:
Study of any open source-testing tool (e.g. Test Link).

EXPERIMENT XI:
Study of any bug tracking tool (e.g. Bugzilla).

EXPERIMENT XII:
Take a mini project (e.g. University admission, Placement Portal) and execute it. During the Life cycle of the mini project create the various testing documents* and final test report document

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

REFERENCE BOOKS :
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson. .

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CASE TOOLS LAB
(Common for IT & CSE)

EXPERIMENT I-VII: (CASE STUDY OF UNIFIED LIBRARY SYSTEM)

1. The student should take up the case study of **Unified Library System** which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.
   Design the following diagrams for Unified Library System.
   1.1 Class Diagram
   1.2 Object Diagram
   1.3 Component Diagram
   1.4 Deployment Diagram
   1.5 Use case Diagram
   1.6 Activity Diagram
   1.7 State machine Diagram
   1.8 Sequence Diagram

EXPERIMENT VIII-XIV: (CASE STUDY OF ATM SYSTEM)

2. The student should take up the case study of **ATM System** which is mentioned in the theory, and Model it in different views i.e Use case view, logical view, component view, Deployment view, Database design, forward and Reverse Engineering, and Generation of documentation of the project.
   Design the following diagrams for ATM System.
   1.1 Class Diagram
   1.2 Object Diagram
   1.3 Component Diagram
   1.4 Deployment Diagram
   1.5 Use case Diagram
   1.6 Activity Diagram
   1.7 State machine Diagram
   1.8 Sequence Diagram

TEXT BOOKS:
1. Software Testing techniques - Baris Beizer, Dreamtech, second edition.
2. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.
REFERENCE BOOKS:
1. The craft of software testing - Brian Marick, Pearson Education.
2. Software Testing Techniques – SPD(Oreille)
3. Software Testing in the Real World – Edward Kit, Pearson.

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INFORMATION SECURITY
(Common to CSE,IT)

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

UNIT - II
Conventional Encryption Principles: Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC**.** Public key cryptography principles: public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management.

UNIT - III
Authentication Applications: Kerberos, X.509 Directory Authentication Service.
Electronic Mail Security: Pretty Good Privacy (PGP) and Secure /Multipurpose Internet Mail Extension (S/MIME)

UNIT – IV
 IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.
Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT - V
Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.
Intruders, Viruses and related threats. Firewall Design principles, Trusted Systems. Intrusion Detection Systems.

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

REFERENCE BOOKS :
1. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson

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IV Year I- Semester   **3**   **1-0-0**   **3**

INFORMATION RETRIEVAL SYSTEMS

UNIT I
Introduction: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data Warehouses. Information Retrieval System Capabilities, Search, Browse, Miscellaneous.

UNIT II
Cataloging and Indexing: Objectives, Indexing Process, Automatic Indexing, Information Extraction. Data Structures: Introduction, Stemming Algorithms, Inverted file structures, N-gram data structure, PAT data structure, Signature file structure, Hypertext data structure. Automatic Indexing: Classes of automatic indexing, Statistical indexing, Natural language, Concept indexing, Hypertext linkages.

UNIT III
Document and Term Clustering: Introduction, Thesaurus generation, Item clustering, Hierarchy of clusters. User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback, Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT IV
Information Visualization: Introduction, Cognition and perception, Information visualization technologies. Text Search Algorithms: Introduction, Software text search algorithms, Hardware text search systems. Information System Evaluation: Introduction, Measures used in system evaluation, Measurement example – TREC results.

UNIT V
Multimedia Information Retrieval, Models and Languages, Data Modeling, Query Languages, Indexing and Searching. Libraries and Bibliographical systems, online IR system, OPACs,Digital Libraries. 180

TEXT BOOKS
1. Information Storage and Retrieval systems Theory and Implementation Second Edition
2. Modern Information Retrival By Ricardo Baeza-Yates, Pearson Education, 2007.

REFERENCE BOOKS
1. Information Retrieval: Algorithms and Heuristics By David A Grossman and Ophir Frider, 2nd Edition, Springer.
2. Frakes, W.B., Ricardo Baeza-Yates: Information Retrieval Data Structures and Algorithms, Prentice Hall, 1992.
3. Modern Information Retrival By Yates Pearson Education.

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IV Year I- Semester   **4**   **1-0-0**   **4**

MOBILE APPLICATION DEVELOPMENT

UNIT I:
J2ME Overview Java 2 Micro Edition and the World of Java, Inside J2ME, J2ME and Wireless Devices Small Computing Technology Wireless Technology, Radio Data Networks, Microwave Technology, Mobile Radio Networks, Messaging, Personal Digital Assistants .
J2ME Architecture and Development Environment J2ME Architecture, Small Computing Device Requirements, Run-Time Environment, MIDlet Programming, Java Language for J2ME, J2ME Software Development Kits, Hello World J2ME Style, Multiple MIDlets in a MIDlet Suite, J2ME Wireless Toolkit.

UNIT II:
 J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices, Commands, Items, and Event Processing, J2ME User Interfaces, Display Class, The Palm OS Emulator, Command Class, Item Class, Exception Handling

UNIT III:
High-Level Display: Screens: Screen Class, Alert Class, Form Class, Item Class, List Class, Text Box Class, Ticker Class Low-Level Display: Canvas: The Canvas, User Interactions, Graphics, Clipping Regions, Animation.

UNIT IV:
Record Management System Record Storage, Writing and Reading Records, Record Enumeration, Sorting Records, Searching Records, Record Listener **JDBC Objects:** The Concept of JDBC, JDBC Driver Types, JDBC Packages, Overview of the JDBC Process, Database Connection, statement Objects, Result set, Transaction Processing, Metadata, Data Types, Exceptions.

UNIT V:
JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, Joining Tables, Calculating Data, Grouping and Ordering Data, Sub queries, VIEWs.
Generic Connection Framework The Connection, Hypertext Transfer Protocol, Communication Management Using HTTP Commands, Session Management, Transmit as a Background Process112 .

TEXT BOOK

1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005

REFERENCE BOOKS

1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3. Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition,J.Knudsen,Pearson

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WIRELESS NETWORKS AND MOBILE COMPUTING
ELECTIVE-II

UNIT I
Introduction to Wireless Networks:
Wireless LAN: Infrared vs radio transmission, Infrastructure and ad hoc networks, IEEE 802. 11-System architecture, protocol architecture, Physical layer, Medium access control layer and MAC management. HIPER LAN-protocol architecture, physical layer channel access control sub layer, information bases and networking. Bluetooth-User scenarios, Physical layer, MAC Layer, Networking, Security and Link Management.

UNIT II
GSM: Mobile Services, System Architecture, Radio Interface, Protocols, Localization and Calling, Handover, Security, and New Data Services.
Mobile computing (MC): Introduction to MC, Novel Applications, Limitations and Architecture
(Wireless) Medium Access Control (MAC): Motivation for a Specialized MAC (Hidden and Exposed Terminals, Near and Far Terminals), SDMA, FDMA, TDMA, CDMA, MAC Protocols for GSM.

UNIT III
Mobile IP Network Layer: IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.
Mobile Transport Layer: Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

UNIT IV
Database Issues: Database Hoarding& Caching Techniques, Client –Server Computing & Adaptation, Transactional Models, Query Processing, Data Recovery Process & QoS Issues.
Data Dissemination and Synchronization : Communications Asymmetry Classification of Data Delivery Mechanisms , Data Dissemination Broadcast Models , Selective Tuning and Indexing Methods ,Digital Audio and Video Broadcasting (DAB & DVB).Data Synchronization –Introduction ,Software ,and Protocols.

UNIT V
Mobile Ad hoc Networks (MANETs): Introduction , localization, MAC issues, Routing protocols, global state routing(GSR), Destination sequenced distance vector routing (DSDV), Dynamic source routing (DSR), Ad Hoc on demand distance vector routing (AODV), Temporary ordered routing algorithm (TORA), QoS in Ad Hoc Networks, Applications & Challenges of a MANET .

TEXT BOOKS

1. "Handbook of Wireless Networks and Mobile Computing", Stojmenovic and Cacute, Wiley, 2002,

2. "Mobile Communications", Jochen Schiller, Addison-Wesley, Second Edition, 2004

REFERENCE BOOKS

1. "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", Reza Behravanfar, Cambridge University Press, Oct2004.

2. "Mobile Computing", Raj Kamal, Oxford University Press ,2007

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SOFTWARE ARCHITECTURE AND DESIGN PATTERN
ELECTIVE-II
(Common to CSE,IT)

UNIT I
Envisioning Architecture The Architecture Business Cycle, What is Software Architecture, Architectural patterns, reference models, reference architectures, architectural structures and views. Creating an Architecture Quality Attributes, Achieving qualities, Architectural styles and patterns, designing the Architecture, Documenting software architectures, Reconstructing Software Architecture.

UNIT II
Analyzing Architectures Architecture Evaluation, Architecture design decision making, ATAM, CBAM. Moving from one system to many Software Product Lines, Building systems from off the shelf components, Software architecture in future.

UNIT III
Patterns Pattern Description, Organizing catalogs, role in solving design problems, Selection and usage.Creational and Structural patterns Abstract factory, builder, factory method, prototype, singleton, adapter, bridge, composite, façade, fly weight.

UNIT IV
Behavioral patterns Chain of responsibility, command, Interpreter, iterator, ediator, memento, observer, state, strategy, template method, visitor.

UNIT V
Case Studies A-7E –A case study in utilizing architectural structures, The World Wide Web -a case study in interoperability, Air Traffic Control –a case study in designing for high availability, Celsius Tech –a case study in product line development,

TEXT BOOKS:
1. Software Architecture in Practice, second edition, Len Bass, Paul Clements & Rick Kazman, Pearson Education, 2003.
2. Design Patterns, Erich Gamma, Pearson Education, 1995.

REFERENCE BOOKS:
1. Software Architecture in Practice, Len Bass, Paul Clements, Rick Kazman.
2. Documenting Software Architectures: Views and Beyond Paul Clements, Felix Bachmann, Len Bass, David Garlen, James Ivers, Reed Little, Robert Nord, Judith Stafford.

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SEMANTIC WEB AND SOCIAL NETWORKS
ELECTIVE-II

UNIT I
Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of Todays Web, The Next Generation Web
Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT II
Ontologies and their role in the semantic web, Ontologies Languages for the Semantic Web - Resource Description Framework(RDF) / RDF Schema. Ontology Web Language(OWL),UML,XML/XML Schema.
Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping,

UNIT III
Logic, Rule and Inference Engines.Semantic Web applications and services.Semantic Search. e-learning, Semantic Bioinformatics, Knowledge Base 202

UNIT IV
XML Based Web Services, Creating an OWL-S Ontology for Web Services. Semantic Search Techno logy, Web Search Agents and Semantic Methods,

UNIT V
What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis - Electronic Discussion networks.
Blogs and Online Communities. Web Based Networks. Building Semantic Web Applications with social network features.

TEXTBOOKS:
1. Thinking on the Web - Berners Lee.Godel and Turing,Wiley interscience,20()8.
2. Social Networks and the Semantic Web, Peter Mika,Springer,2007.

REFERENCE BOOKS:
1. Semantic Web Technologies,Trends and Research in Ontology Based Systems, J.Davies, Rudi Studer. Paul Warren, John Wiley & Sons.
2. Semantic Web and Semantic Web Services -Liyang Lu Chapman and Hall/CRC Publishers,(Taylor & Francis Group)
3. Information Sharing on the semantic Web - Heiner Stuckenschmidt; Frank Van Harmelen, Springer Publications.

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SOFT COMPUTING
ELECTIVE-II
(Common to CSE,IT)

UNIT I

Introduction : Neural Networks, Fuzzy Logic, Genetic Algorithms, Hybrid Systems, Soft Computing, Soft Computing Constituents, Soft Computing Characteristics. Artificial Neural Networks : Introduction, Fundamental Concept, Evolution of Neural Networks, Basic models of ANN, Important Terminologies.

UNIT-II

Supervised Learning Networks: Introduction, Perceptron Networks, Adaptive Linear Neuron, Back propagation Network. Associative Memory Networks: Introduction, Training Algorithms for pattern association and Hopfield Networks.

UNIT-III

Unsupervised Learning Network: Introduction, Fixed Weight Competitive Nets, Kohonen Self-Organizing Feature Maps, Counter Propagation Networks.
Fuzzy Sets : Introduction, Classical Sets, Fuzzy Sets, Classical Relations, Fuzzy Relations

UNIT-IV

Membership functions- Features, Fuzzification, Membership value assignments, Defuzzification Methods, Fuzzy Arithmetic, Fuzzy Measures, Fuzzy Inference Systems, Fuzzy Logic Control Systems

UNIT-V

Genetic Algorithms- Introduction, Basic operators and terminology, Traditional Algorithm vs Genetic Algorithm, Simple GA, General GA, Classification of GA, Genetic Programming, Applications of GA.
Applications of Soft Computing: Internet Search Technique, Hybrid Fuzzy Controllers.

TEXT BOOKS:
1. Principles of Soft Computing- S N Sivanandam, S N Deepa, Wiley India, 2007
2. Neuro-Fuzzy and Soft Computing A Computational Approach to Learning and Machine Intelligence – J.S.R.Jang, C.T.Sun, E.Mizutani, PHI 177

REFERENCE BOOKS:
1. Artificial Intelligence and Soft Computing- Behavioral and Cognitive Modeling of the Human Brain- Amit Konar, CRC press, Taylor and Francis Group.
2. Soft Computing and Intelligent System Design -Fakhreddine O Karray, Clarence D Silva,. Pearson Edition, 2004.
3. Artificial Intelligence – Patric Henry Winston – Third Edition, Pearson Education.

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SOFTWARE PROJECT MANAGEMENT
ELECTIVE-III
(Common to CSE,IT,ECM)

UNIT I

Conventional Software Management: The waterfall model, conventional software Management performance.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

UNIT II

The old way and the new way: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

UNIT III

Work Flows of the process: Software process workflows, Iteration workflows.

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

UNIT IV

Process Automation: Automation Building blocks.

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

UNIT V

Project Organizations and Responsibilities: Line-of-Business Organizations

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions. **Case Study:** The command Center Processing and Display system- Replacement (CCPDS-R) 151

TEXT BOOKS
1. Software Project Management, Walker Royce: Pearson Education, 2005.
2. Software Project Management, Joel Henry, Pearson Education.
REFERENCE BOOKS
1. Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw- Hill Edition.
2. Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

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SCRIPTING LANGUAGES
ELECTIVE-III

UNIT – I Introduction to Scripting and PERL

Scripts and Programs, Origin of Scripting , Scripting Today, Characteristics of Scripting Languages,Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

Advanced PERL:

Finer points of looping, pack and unpack, filesystem, eval, datastructures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security Issues.

UNIT – II

PHP Basics- Features,Embedding PHP Code in your Web pages,Outputting the data to the browser, Datatypes, Variables, Constants,expressions,string interpolation, control structures . Function,Creating a Function,Function Libraries,Arrays,strings and Regular Expressions.

UNIT III

Advanced PHP Programming:

PHP and Web Forms, Files, PHP Authentication and Methodolgies -Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

UNIT –IV TCL-TK

TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures , strings , patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.

TkTk-Visual Tool Kits, Fundamental Concepts of Tk, Tk by example, Events and Binding , Perl-Tk.

UNIT – V Python

Introduction to Python language, python-syntax,statements,functions,Built-in-functions and Methods, Modules in python, Exception Handling. Integrated Web Applications in Python – Building Small, Efficient Python Web Systems, Web Application Framework.

TEXT BOOKS:
1. The World of Scripting Languages, David Barron,Wiley Publications.
2. Python Web Programming , Steve Holden and David Beazley ,New Riders Publications

REFERENCE BOOKS:

1. Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP,J.Lee and B.Ware(Addison Wesley) Pearson Education.
2. Programming Python,M.Lutz,SPD.
3. PHP 6 Fast and Easy Web Development ,Julie Meloni and Matt Telles, Cengage Learning Publications. PHP 5.1,I.Bayross and S.Shah,The X Team,SPD

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COMPUTER FORENSICS
ELECTIVE-III

UNIT I
Computer Forensics Fundamentals: What is Computer Forensics?. Use of Computer Forensics in Law Enforcement, Computer Forensics in Law Enforcement, Computer Forensics Assistance to Human Resources/Employment Proceedings, Computer Forensics Services, Benefits of professional Forensics Methodology, Steps taken by computer Forensics Specialists.
Types of Computer Forensics Technology: Types of Military Computer Forensics Technology, Types of Law Enforcement - Computer Forensic Technology - Types of Business Computer Forensics Technology. Computer Forensics Evidence and Capture: Data Recovery Defined- Data Back-up and Recovery- The Role of Back-up in Data Recovery- The Data Recovery Solution.

UNIT II
Evidence Collection and Data Seizure: Why Collection Evidence? Collection Options – Obstacles – Types of Evidence – The Rules of Evidence- Volatile Evidence- General Procedure – Collection and Archiving – Methods of Collection – Artifacts – Collection Steps – Controlling Contamination: The chain of Custody.
Duplication and preservation of Digital Evidence: Preserving the Digital Crime Scene – Computer Evidence Processing Steps – Legal Aspects of Collecting Preserving Computer Forensics Evidence. Computer Image Verification and Authentication: Special Needs of Evidential Authentication – Practical Consideration – Practical Implementation.

UNIT III
Computer Forensics analysis and validation: Determining what data to collect and analyze, validating forensic data, addressing data – hiding techniques, performing remote acquisitions.
Network Forensics: Network Forensics overview, performing live acquisitions, developing standard procedures for network forensics, unsing network tools, examining the honeynet project.

UNIT IV
Processing crime and incident scenes: Identifying digital evidence, collecting evidence in private-sector incident scenes, processing law enforcement crime scenes, preparing for a search, securing a computer incident or crime scene, seizing digital evidence at the scene, storing digital evidence, obtaining a digital hash, reviewing a case.
Current computer forensic tools: evaluating computer forensic tool needs, computer forensics software tools, computer forensics hardware tools, validating and testing forensics software.

UNIT V
E-Mail investigations: Exploring the role of E-mail in investigation, exploring the role of the client and server in E-mail, investigating e-mail crimes and violations, understanding e-mail

servers, using specialized e-mail forensic tools.

Cell phone and mobile device forensics: Understanding mobile device forensics, understanding acquisition procedures for cell phones and mobile devices.

Working with windows and DOS Systems: Understanding file systems, exploring Microsoft File Structures, Examining NTFS Disks, Understanding whole disk encryption, windows registry, Microsoft startup tasks, MS-DOS Startup tasks, virtual machines.

TEXT BOOKS

1. Computer forensics, computer crime investigation by John R.Vacca, Firewall Media, New Delhi.
2. Computer forensics and investigations by Nelson, Phillips Enfinger Steuart, CENGAGE Learning.

REFERENCE BOOKS

1. Real Digital Forensics by Keith J.Jones, Rechard Bejtlich, Curtis W.Rose, Addison-Wesley Pearson Education.
2. Forensic compiling, A Tractitioneris Guide By Tony Sammes and Brain Jenkinson, Springer International Edition.
3. Computer Evidence Collection & Presentation by Christopher L.T.Brown, Firewall Media.

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IV Year I-Semester   **3**   **0-0-0**   **3**

COMPUTER GRAPHICS
ELECTIVE-III
(Common to CSE,IT,ECM)

UNIT I

Introduction, Application areas of Computer Graphics, overview of graphics systems, video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations and input devices

UNIT II

Output primitives: Points and lines, line drawing algorithms, mid-point circle and ellipse algorithms. Filled area primitives: Scan line polygon fill algorithm, boundary-fill and flood-fill algorithms
2-D Geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

UNIT III

2-D Viewing : The viewing pipeline, viewing coordinate reference frame, window to view-port coordinate transformation, viewing functions, Cohen-Sutherland and Cyrus-beck line clipping algorithms, Sutherland –Hodgeman polygon clipping algorithm.

UNIT IV

3-D Object representation: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and   B-spline surfaces. Basic illumination models, polygon rendering methods.
3-D Geometric transformations: Translation, rotation, scaling, reflection and shear transformations, composite transformations, 3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

UNIT V

Visible surface detection methods: Classification, back-face detection, depth-buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree methods

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc Graw hill edition.
2. "Procedural elements for Computer Graphics", David F Rogers, Tata Mc Graw hill, 2nd edition.
3. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.

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IV Year I- Semester   **4**   **1-0-0**   **4**

EMBEDDED SYTEMS
(Common to IT,ECM)

UNIT -I:
Embedded Computing: Introduction, complex systems and microprocessor, the embedded system design process, formalisms for system design, design examples.

UNIT -II:
The 8051 Architecture: Introduction, 8051 micro controller hardware, input/output ports and circuits, external memory, counter and timers, serial data input/output, interrupts.
Basic Assembly Language Programming Concepts: The assembly language programming process, programming tools and techniques, programming the 8051. Data transfer and logical instructions, arithmetic operations, decimal arithmetic, jump and call instructions.

UNIT -III:
Introduction to Real-Time Operating Systems: Tasks and task states, tasks and data, semaphores, and shared data; message queues, mailboxes and pipes, timer functions, events, memory management, interrupt routines in an RTOS environment.
Basic Design Using a Real-Time Operating System: Principles, semaphores and queues, hard real-time scheduling considerations, saving memory and power, an example RTOS like uC-OS (open source).

UNIT -IV:
Embedded Software Development Tools: Host and target machines, linker/locators for embedded software, getting embedded software into the target system
Debugging Techniques: Testing on host machine, using laboratory tools, an example system.

UNIT -V:
Introduction to advanced Architectures: ARM and SHARC, processor and memory organization and instruction level parallelism; networked embedded systems: bus protocols, I^2C bus and CAN bus; internet-enabled systems, design example-elevator controller.

TEXT BOOKS:
1. Wayne Wolf (2008), Computers as Components-principles of embedded computer system design, Elseveir, New Delhi, India.
2. Kenneth J. Ayala (2008), The 8051 Microcontroller, 3rd edition, Cengage Learning, India.

REFERENCE BOOKS:
1. David E. Simon (1999), An Embedded Software Primer, Pearson Education, India.
2. Jean J. Labrosse (2000), Embedding System Building Blocks, 2nd edition, CMP publishers, USA.
3. Raj Kamal (2004), Embedded Systems, Tata McGraw hill, India.

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MOBILE APPLICATION DEVELOPMENT LABORATORY

EXPERIMENT - I: Installation of Java Wireless Toolkit (J2ME)

EXPERIMENT- II: Working with J2ME Features:
Create a Hello World program which creates to following kind of menu.
- Cut.
- Copy.
- Past.
- delete.
- Select all.
- Unselect all.

EXPERIMENT-III: Event Handling.
Create a menu which has the following options:
- cut - can be on/off
- copy - can be on/off
- paste - can be on/off
- delete - can be on/off
- select all - put all 4 options on
- unselect all - put all 4 options off

EXPERIMENT-IV: Input checking
Create an MIDP application which examine, that a phone number, which a user has entered is in the given format.
- Area code should be one of the following: 040, 041, 050, 0400, 044
- There should 6-8 numbers in telephone number (+ area code)

EXPERIMENT- V: Threads & High Level UI:
3.1. Create a slide show which has three slides, which includes only text. Program should change to the new slide after 5 seconds. After the third slide program returns to the first slide.

EXPERIMENT-VI: High-level UI
Create a MIDP application, which show to the user 5-10 quiz questions. All questions have 4 possible options and one right option exactly. Application counts and shows to the user how many right answers were right and shows them to user.

EXPERIMENT-VII: Create a MIDP application, where the user can enter player name and points. The program saves the information to the record using RMS at MIDP device. Program should also print out the top 10 player list to the end user. You can use this class in your game if you made own class for saving and reading record sets.

EXPERIMENT-VIII: Working on Drawing and Images
Create a slide show which has three slides, which includes pictures at PNG format. Program should change to the new slide other 5 seconds.

EXPERIMENT-IX: Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array.

EXPERIMENT-X: Create a MIDP application, which draws a bar graph to the display. Data values can be given at int[] array. You can enter four data (integer) values to the input text field.

EXPERIMENT – XI: Developing Networked Applications using the Wireless Toolkit
- Creating a Simple Client-Server Application
- Create, compile and run a basic UDP-based client-server application.
- Creating the Datagram Server project

EXPERIMENT – XII: Authentication with a Web Server
- Write a sample program to show how to make a SOCKET Connection from j2me phone.
- Login to HTTP Server from a J2ME Program

Note: Use Apache Tomcat Server as Web Server and Mysql as Database Server.

EXPERIMENT - XIII & XIV Web Application using J2ME
The following should be carried out with respect to the given set of application domains: (Assume that the Server is connected to the well-maintained database of the given domain. Mobile Client is to be connected to the Server and fetch the required data value/information)
- Students Marks Enquiry
- Town/City Movie Enquiry
- Railway/Road/Air (For example PNR) Enquiry/Status
- Sports (say, Cricket) Update
- Town/City Weather Update
- Public Exams (say Intermediate or SSC)/ Entrance (Say EAMCET) Results Enquiry

Divide Student into Batches and suggest them to design database according to their domains and render information according the requests.

TEXT BOOKS:
1. J2ME: The Complete Reference, James Keogh, Tata McGrawHill.
2. Beginning J2ME: From Novice to Professional, Third Edition, Sing Li, Jonathan B. Knudsen, Apress, 2005

REFERENCE BOOKS:
1. Enterprise J2ME: Developing Mobile Java Applications – Michael Juntao Yuan, Pearson Education, 2004
2. Beginning Java ME Platform, Ray Rischpater, Apress, 2009
3. Kicking Butt with MIDP and MSA:Creating Great Mobile Applications,1st edition,J.Knudsen,Pearson.

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EMBEDDED SYSTEMS LABORATORY

(Using 89c51 SDK (Software Development Kit))

EXPERIMENT I: Write a simple assembly program on Arithmetic Operations

EXPERIMENT II: Write a simple assembly program on Logical Operations.

EXPERIMENT III: Write a program on Addressing modes.

EXPERIMENT IV: Write a program to Read inputs from switches in 89c51 SDK

EXPERIMENT V: Write a program to read inputs and blink the LEDs in different patterns in 89cSDK.

EXPERIMENT VI: Write a Program for serial Communication between Microcontrollers to PC vice versa

- For Microcontroller to PC communication the data should be transferred from microcontroller to PC Terminal window.
- For PC to microcontroller communication the data should be transferred from PC terminal window to Microcontroller LCD display.

EXPERIMENT VII: Write a Program for Encryption and Decryption.

- Use 4x3 keyboard interface (for enter data)
- Use LCD interface (display data)
- Use serial Communication (display data at PC terminal window)

EXPERIMENT VIII: Develop necessary interfacing circuit to read data from a temperature sensor and process using 89c51 SDK , the data has to be displayed on a PC Terminal window.

EXPERIMENT IX: Sort RTOS on to 89c51 Microcontroller and verify.
- Run 2 to 3 tasks simultaneously on 89c51 SDK
- Use LCD interface, LED interface, Serial communication.

EXPERIMENT X: Write a program to read input from switches display the switch number in seven segment display and Develop necessary interfacing circuit to process display. (example : if we press switch 1 it should display 1 on the seven segment display)

EXPERIMENT XI: Write a program to read input from switches and turn on bulb which can works With 230 V AC using relay interface, develop necessary interfacing circuit for 89c52SDK. (example : if we press switch 1 it should turn on bulb 1 vice versa)

EXPERIMENT XII: Write a program to display Real time Clock on SEVEN SEGMENT DISPLAY and Develop necessary interfacing circuit to process TIME display.

EXPERIMENT XIII: Write a program to implement calculator which can execute basic operations such as addition, subtraction, multiplication and division and develop necessary interfacing circuit for process the operations with 89c52 SDK.

- Use Keyboard Interface (for read input from user)
- Use 2-line LCD Interface (for display the input and display the output).

EXPERIMENT XIV: Write a program that generate ramp signal on the DAC output.

TEXT BOOKS:
1. KVKKF Prasad : Embedded /Real-Time Systems , Dreamtech,Press.
2. The 8051 micro controller & Embedded Systems using assembly and C By Kenneth J.Ayala Dhananjay V.Gadre

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SOFT SKILLS LAB-I
(Common to all branches)

KNOW YOURSELF/ SELF DISCOVERY and SOFT SKILLS

EXPERIMENT-I: Introduction—Importance of Knowing Yourself
Process of knowing yourself—SWOT analysis
Benefits of SWOT analysis---Using SWOT analysis
SWOT analysis grid—questions to complete the grid

EXPERIMENT-II: Introduction –What are soft skills?—importance of soft skills
Selling your skills—Attributes regarded as soft skills—Soft Skills
Social Soft Skills—Thinking Soft Skills—Negotiating –Exhibiting your Soft Skills

EXPERIMENT-III: Identifying your soft skills—Improving your soft skills –Train Yourself
Top 60 soft skills—Practicing soft skills—Measuring Attitudes

Time and Stress Management

EXPERIMENT-IV: Introduction—The 80-20 rule—take a good look at the people around
you—Examine your work
Sense of time management –around you—examine your work—sense of time
management
Time is money—features of time—three secrets of time management

EXPERIMENT-V: Time management matrix—analysis of time matrix—effective scheduling
Grouping of activities—five steps to successful time management
Difficulties in time management—evils of not planning—interesting facts about time
Deal say of spending a day—time wasters—time savers—realizing the value of time
Time circle planner.
Introduction –Meaning—Effects , Kinds , and Sources of Stress
Case study—spotting stress—stress management tips

Activity III Developing Positive Attitude
EXPERIMENT-VI: Introduction—meaning –features of attitudes—attitude and human behavior
: Passive, Aggressive and Behavior
Formation of attitudes—change of attitudes—what can you do to change attitude?
Ways of changing attitude in a person—attitude in a workplace
Features of a good team player

EXPERIMENT-VII: The power of positive attitude—developing positive attitude

Obstacles in developing positive attitude—staying negative—examples of negative attitude

Overcoming negative attitude—negative attitude and its results.

Activity IV   Body Language

EXPERIMENT-VIII: Introduction –body talk—Voluntary and involuntary body language

Forms of body language—parts of body language—origin of body language

Uses of body language—Body language in building interpersonal relations

EXPERIMENT-IX: Body language in building interpersonal relations—reasons to study body language

Improving your body language –types of body language—gender differences

Body language—shaking hands

Interpreting body language

Activity V Practice in Presentation Skills

EXPERIMENT-X: Types of Presentations

Do's and Don'ts of Presentation Skills

EXPERIMENT-XI: Body language in presentation skills

EXPERIMENT-XII: Examples—Aspects, etc

TEXT BOOKS:

1. Soft Skills: Know Yourself and Know the World—Dr. K. Alex-S. Chand Publising-2010

REFERENCE BOOKS:

1. Managing Soft skills: K.R. Lakshminarayanan & Murugavel, Scitech Publications-2010

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MANAGEMENT SCIENCE FOR ENGINEERS
(Common to ECE,EEE,CIVIL,CSE,IT,ECM)

UNIT-I:

Introduction to Managerial Economics, Concepts of Managerial Economics:
Demand Analysis: Law of Demand, Elasticity of demand & Demand Forecasting.
Production and cost Analysis: Production functions, Laws of Returns, Economies of scale.
Cost Concepts: Different types of costs: Variable cost, Fixed cost, Marginal cost, Semi-variable cost. Break-even Analysis.

UNIT-II:

Market Structures: Different types of Markets.
Pricing: Methods of Pricing and strategies, Skimming and Penetration Pricing.
Capital budgeting: Estimation of fixed and working capital, Methods & sources of raising capital. Methods of capital budgeting, Traditional and Discounted Techniques.
Financial accounting & Financial Analysis: Overview of financial Accounts, Journal, Subsidiary books, Ledger, Trial Balance and Preparation of Trading Account, Profit & Loss Account and Balance Sheet. Financial Analysis with the help of Ratios.

UNIT-III:

Management: Functions of management. Taylor's scientific management theory, Fayol's principles of management.
Designing of organization structures: Different Methods with Merits and demerits and their suitability.
Human Recourse Management: Recruitment, Selection, Training and Development and Permanence Appraisal.

UNIT-IV:

Operation Management: Types of plant layout, Methods of production, work, study-procedure involved in Methods study and work Measurement. Statistical quality control. $\overline{X}$, R, C & P charts.
Project Management: Programme Evaluation and Review Technique (P E R T), critical path method (C PM). Identification of critical path.

UNIT-V:

Material Management: Objectives, Need for Inventory Control, EOQ, ABC Analysis, VED Analysis, Purchase procedure, stores Management.
Marketing: Functions, Marketing Mix, Marketing strategies based on product life cycle, channels of distributions.

TEXT BOOKS:
1. Managerial Economics& Financial Accounting – Prentice Hall of India: Dr.M.Kasi Reddy, Dr.S.Saraswathi
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

REFERENCE BOOKS:
1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 2009

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CLOUD COMPUTING
ELECTIVE-IV
(Common to CSE,IT)

UNIT-I:
Principles of Parallel and Distributed Computing, Introduction to cloud computing, Cloud computing Architecture, cloud concepts and technologies, cloud services and platforms, Cloud models, cloud as a service, cloud solutions, cloud offerings, introduction to Hadoop and Mapreduce.

UNIT-II:
Cloud Platforms for Industry, Healthcare and education, Cloud Platforms in the Industry, cloud applications. Virtualization, cloud virtualization technology, deep dive: cloud virtualization,
Migrating in to cloud computing, Virtual Machines Provisioning and Virtual Machine Migration Services, On the Management of Virtual Machines for cloud Infrastructure, Comet cloud, T-Systems.

UNIT-III:
Cloud computing Applications: Industry, Health, Education, Scientific Applications, Business and Consumer Applications, Understanding Scientific Applications for Cloud Environments, Impact of Cloud computing on the role of corporate IT.
Enterprise cloud computing Paradigm, Federated cloud computing Architecture, SLA Management in Cloud Computing, Developing the cloud: cloud application Design.

UNIT-IV:
Python Basics, Python for cloud, cloud application development in python, Cloud Application Development in Python.
Programming Google App Engine with Python: A first real cloud Application, Managing Data in the cloud, Google app engine Services for Login Authentication, Optimizing UI and Logic, Making the UI Pretty: Templates and CSS, Getting Interactive. Map Reduce Programming Model and Implementations.

UNIT-V:
Cloud management, Organizational Readiness and change management in the cloud age ,Cloud Security, Data security in the cloud, Legal Issues in the Cloud , Achieving Production Readiness for the cloud Services

TEXT BOOKS:
1.   Cloud Computing: Raj Kumar Buyya , James Broberg, andrzej Goscinski, 2013 Wiley
2.   Mastering Cloud Computing: Raj Kumar buyya, Christian Vecchiola,selvi-2013.

REFERENCE BOOKS:
1. Cloud Computing: Arshdeep Bahga, Vijay Madisetti, 2014, University Press.
2. Cloud computing: Dr Kumar Saurab Wiley India 2011.
3. Code in the Cloud: Mark C.Chu-Carroll 2011, SPD.(Second part of IV UNIT)

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ENTERPRISE COMPUTING
ELECTIVE-IV
(Common to CSE,IT)

UNIT-I:

Introduction Enterprise Computing: Enterprise systems, Enterprise Resource Planning, benefits of ERP, Data in Enterprise systems, Business Intelligence.

UNIT-II:

Business Process Reengineering

Business Process Reengineering- need and challenges, - Management concernsabout BPR. - BPR to build business Model for ERP. ERP & Competitiveadvantage, - Basic Constituents of ERP, Selection criteria for ERP Packages. Procurement process for ERP Package

UNIT-III:

Erp Packages

Overview of ERP packages – PEOPLE SOFT, SAP-R/3, BAAN IV, MFG/PRO,IFS/AVALON, ORACLE- FINANCIAL, Survey of Indian ERP Packages regarding their Coverage, performance & cost.

UNIT-IV:

Erp Implementation

ERP Implementation- issues, Role of Consultants, Vendors, Users, - Need fortraining, customization. ERP implementation methodology and post implementation issues and options.

UNIT-V:

Erp Case Studies

ERP Case Studies In Hrm, Finance, Production, Product Database, Materials, Sales & Distribution.

TEXT BOOKS:
1. Bret Wagner, Ellen Monk, "Concepts in Enterprise Resource Planning", 2012.
2. Bret Wagner, Ellen Monk, "Enterprise Resource Planning", Third Edition Cengage Learning, 2008.

REFERENCE BOOKS:
1. Simha R Magal : Integrated Business process with ERP Systems, Wiley 2011
2. Ashu Gupta, Rajesh Verma, Jatindar kumar, "Enterprise Resource Planning: Concepts and Applications", 2012.

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ADVANCED MOBILE COMPUTING
ELECTIVE-IV
(Common to CSE,IT)

UNIT I : INTRODUCTION

Mobile Computing – Mobile Computing Vs wireless Networking – Mobile Computing Applications –Characteristics of Mobile computing – Structure of Mobile Computing Application. MAC Protocols – Wireless MAC Issues − Fixed Assignment Schemes − Random Assignment Schemes – Reservation Based Schemes.

UNIT II: MOBILE INTERNET PROTOCOL AND TRANSPORT LAYER

Overview of Mobile IP – Features of Mobile IP – Key Mechanism in Mobile IP – route Optimization. Overview of TCP/IP – Architecture of TCP/IP- Adaptation of TCP Window – Improvement in TCP Performance.

UNIT III : MOBILE TELECOMMUNICATION SYSTEM

Global System for Mobile Communication (GSM) – General Packet Radio Service (GPRS) – Universal Mobile Telecommunication System (UMTS).

UNIT IV: MOBILE AD-HOC NETWORKS

Ad-Hoc Basic Concepts − Characteristics − Applications − Design Issues − Routing − Essential of Traditional Routing Protocols –Popular Routing Protocols − Vehicular Ad Hoc networks (VANET) –MANET Vs VANET – Security.

UNIT V: MOBILE PLATFORMS AND APPLICATIONS

Mobile Device Operating Systems – Special Constrains & Requirements – Commercial Mobile Operating Systems – Software Development Kit: iOS, Android, BlackBerry, Windows Phone – MCommerce – Structure – Pros & Cons – Mobile Payment System – Security Issues.

TEXT BOOK:
1. Prasant Kumar Pattnaik, Rajib Mall, "Fundamentals of Mobile Computing", PHI Learning Pvt. Ltd, New Delhi – 2012. 64
2. Jochen H. Schller, "Mobile Communications", Second Edition, Pearson Education, New Delhi,2007.

REFERENCE BOOKS:
1. Dharma Prakash Agarval, Qing and An Zeng, "Introduction to Wireless and Mobile systems", Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, 2003.
3. William.C.Y.Lee,"Mobile Cellular Telecommunications-Analog and Digital Systems", Second Edition,Tata Mc Graw Hill Edition ,2006.

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VISUAL PROGRAMMING TECHNIQUES
ELECTIVE-IV
(Common to CSE,IT)

UNIT-I

Windows Programming Fundamentals – MFC – Windows – Graphics – Menus – Mouse and keyboard – Bitmaps – Palettes – Device-Independent Bitmaps

UNIT-II

Controls – Modal and Modeless Dialog – Property – Data I/O – Sound – Timer

UNIT-III

Memory management – SDI – MDI – MFC for Advanced windows user Interface – status bar and Toolbars – Tree view – List view – Threads

UNIT -IV

ODBC – MFC Database classes – DAO - DLLs – Working with Images

UNIT-V

COM Fundamentals – ActiveX control – ATL – Internet Programming

TEXT BOOK:
1. Richard C.Leinecker and Tom Archer, "Visual C++ 6 Programming Bible", Wiley
   DreamTech Press, 2006.
2. Lars Klander, "Core Visual C++ 6", Pearson Education, 2000

REFERENCEBOOKS:
1. Deital, DEital, Liperi and Yaeger "Visual V++ .NET How to Program" , Pearson Education, 2004.

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BIG DATA ANALYTICS
ELECTIVE-V
(Common to CSE,IT)

UNIT-I:
Big Data Analytics : What is big data, History of Data Management ; Structuring Big Data ; Elements of Big Data ; Big Data Analytics; Distributed and Parallel Computing for Big Data;
Big Data Analytics:What is Big Data Analytics, What Big Data Analytics Isn't, Why this sudden Hype Around Big Data Analytics, Classification of Analytics, Greatest Challenges that Prevent Business from Capitalizing Big Data; Top Challenges Facing Big Data; Why Big Data Analytics Important; Data Science; Data Scientist; Terminologies used in Big Data Environments; Basically Available Soft State Eventual Consistency (BASE); Open source Analytics Tools.

UNIT-II:
Understanding Analytics and Big Data: Comparing Reporting and Analysis, Types of Analytics; Points to Consider during Analysis; Developing an Analytic Team; Understanding Text Analytics.
Analytical Approach and Tools to Analyze Data: Analytical Approaches; History of Analytical Tools; Introducing Popular Analytical Tools; Comparing Various Analytical Tools.

UNIT-III:
Understanding MapReduce Fundamentals and HBase : The MapReduce Framework; Techniques to Optimize MapReduce Jobs; Uses of MapReduce; Role of HBase in Big Data Processing; Storing Data in Hadoop : Introduction of HDFS, Architecture, HDFC Files, File system types, commands, org.apache.hadoop.io package, HDF, HDFS High Availability; Introducing HBase, Architecture, Storing Big Data with HBase , Interacting with the Hadoop Ecosystem; HBase in Operations-Programming with HBase; Installation, Combining HBase and HDFS.

UNIT-IV:
Big Data Technology Landscape and Hadoop : NoSQL, Hadoop; RDBMS versus Hadoop; Distributed Computing Challenges; History of Hadoop; Hadoop Overview; Use Case of Hadoop; Hadoop Distributors; HDFC (Hadoop Distributed File System), HDFC Daemons, read,write, Replica Processing of Data with Hadoop; Managing Resources and Applications with Hadoop YARN.

UNIT-V:
Social Media Analytics and Text Mining: Introducing Social Media; Key elements of Social Media; Text mining; Understanding Text Mining Process; Sentiment Analysis, Performing Social Media Analytics and Opinion Mining on Tweets;
Mobile Analytics: Introducing Mobile Analytics; Define Mobile Analytics; Mobile Analytics and Web Analytics; Types of Results from Mobile Analytics; Types of Applications for Mobile Analytics; Introducing Mobile Analytics Tools;

TEXT BOOKS:
1. BIG DATA and ANALYTICS, Seema Acharya, Subhasinin Chellappan, Wiley publications.
2. BIG DATA, Black Book^{TM} , DreamTech Press, 2015 Edition.

REFERENCEBOOKS:
1. BUSINESS ANALYTICS 5e , BY Albright |Winston

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INTERNET OF THINGS
ELECTIVE-V
(Common to CSE,IT)

UNIT-I:

Introduction to Internet of Things –Definition and Characteristics of IoT,

Physical Design of IoT – IoT Protocols, IoT communication models, Iot Communication APIs

IoT enabaled Technologies – Wireless Sensor Networks, Cloud Computing, Big data analytics, Communication protocols, Embedded Systems, IoT Levels and Templates.

Domain Specific IoTs – Home, City, Environment, Energy, Retail, Logistics, Agriculture, Industry, health and Lifestyle.

UNIT-II:

IoT and M2M – Software defined networks, network function virtualization, difference between SDN and NFV for IoT Basics of IoT System Management with NETCOZF, YANG- NETCONF, YANG, SNMP NETOPEER.

UNIT-III:

Introduction to Python - Language features of Python, Data types, data structures, Control of flow, functions, modules, packaging, file handling, data/time operations, classes, Exception handling Python packages - JSON, XML, HTTPLib, URLLib, SMTPLib.

UNIT-IV:

IoT Physical Devices and Endpoints - Introduction to Raspberry PI-Interfaces (serial, SPI, I2C) Programming – Python program with Raspberry PI with focus of interfacing external gadgets, controlling output, reading input from pins.

UNIT-V:

IoT Physical Servers and Cloud Offerings – Introduction to Cloud Storage models and communication APIs Webserver – Web server for IoT, Cloud for IoT, Python web application frameworkDesigning a RESTful web API.

TEXT BOOKS:
1. Internet of Things - A Hands-on Approach, Arshdeep Bahga and Vijay Madisetti, Universities Press, 2015, ISBN: 9788173719547
2. Getting Started with Raspberry Pi, Matt Richardson & Shawn Wallace, O'Reilly (SPD), 2014, ISBN: 9789350239759

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CYBER SECURITY
ELECTIVE-V
(Common to CSE,IT)

UNIT-I :

Introduction to Cybercrime: Introduction, Cybercrime and Information security, who are cybercriminals, Classifications of Cybercrimes, Cybercrime: The legal Perspectives and Indian Perspective, Cybercrime and the Indian ITA 2000, A Global Perspective on Cybercrimes.

Cyber offenses: How criminals Plan Them: Introduction, How Criminals plan the Attacks, Social Engineering, Cyber stalking, Cyber cafe and Cybercrimes, Botnets: The Fuel for Cybercrime, Attack Vector, Cloud Computing.

UNIT-II :

Cybercrime: Mobile and Wireless Devices: Introduction, Proliferation of Mobile and Wireless Devices, Trends in Mobility, Credit card Frauds in Mobile and Wireless Computing Era, Security Challenges Posed by Mobile Devices, Registry Settings for Mobile Devices, Authentication service Security, Attacks on Mobile/Cell Phones, Mobile Devices: Security Implications for Organizations, Organizational Measures for Handling Mobile, Organizational Security Policies an Measures in Mobile Computing Era, Laptops.

UNIT- III:

Cybercrimes and Cyber security: the Legal Perspectives: Introduction: Cyber Crime and Legal Landscape around the world, Why Do We Need Cyber laws: The Indian Context, The Indian IT Act, Challenges to Indian Law and Cybercrime Scenario In India, Digital signatures and the Indian IT Act, Amendments to the Indian IT Act, Cybercrime and Punishment Cyber law, Technology and Students: Indian Scenario.

UNIT- IV :

Understanding Computer Forensics

Introduction, Historical background of Cyber forensics, Digital Forensics Science, The Need for Computer Forensics, Cyber Forensics and Digital evidence, Forensics Analysis of Email, Digital Forensics Lifecycle, Chain of Custody concept, Network Forensics, Approaching a computer, Forensics Investigation, Challenges in Computer Forensics, Special Tools and Techniques Forensics Auditing

UNIT-V:

Cyber Security: Organizational Implications

Introduction, Cost of Cybercrimes and IPR issues, Web threats for Organizations, Security and Privacy Implications, Social media marketing: Security Risks and Perils for Organizations, Social Computing and the associated challenges for Organizations.

TEXT BOOKS:
1. **Cyber Security**: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives, Nina Godbole and Sunil Belapure, Wiley INDIA.
2. **Introduction to Cyber Security** , Chwan-Hwa(john) Wu,J.David Irwin.CRC Press T&F Group

REFERENCE BOOK:
1. **Cyber Security Essentials**, James Graham, Richard Howard and Ryan Otson, CRC Press.

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MACHINE LEARNING
ELECTIVE-V
(Common to CSE,IT)

UNIT-I :
INTRODUCTION - Well-posed learning problems, Designing a learning system, Perspectives and issues in machine learning
Concept learning and the general to specific ordering – Introduction, A concept learning task, Concept learning as search, Find-S: finding a maximally specific hypothesis, Version spaces and the candidate elimination algorithm, Remarks on version spaces and candidate elimination, Inductive bias.

UNIT-II :
Decision Tree learning – Introduction, Decision tree representation, Appropriate problems for decision tree learning, The basic decision tree learning algorithm, Hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Issues in decision tree learning
Artificial Neural Networks – Introduction, Neural network representation, Appropriate problems for neural network learning, Perceptions, Multilayer networks and the back propagation algorithm, Remarks on the back propagation algorithm, An illustrative example face recognition.Advanced topics in artificial neural networks
Evaluation Hypotheses – Motivation, Estimation hypothesis accuracy, Basics of sampling theory, A general approach for deriving confidence intervals, Difference in error of two hypotheses, Comparing learning algorithms.

UNIT-III :
Bayesian learning – Introduction, Bayes theorem, Bayes theorem and concept learning, Maximum likelihood and least squared error hypotheses, Maximum likelihood hypotheses for predicting probabilities, Minimum description length principle, Bayes optimal classifier, Gibs algorithm, Naïve Bayes classifier, An example learning to classify text, Bayesian belief networks The EM algorithm.
Computational learning theory – Introduction, Probability learning an approximately correct hypothesis, Sample complexity for Finite Hypothesis Space, Sample Complexity for infinite Hypothesis Spaces, The mistake bound model of learning - **Instance-Based Learning**-Introduction, k -Nearest Neighbour Learning, Locally Weighted Regression, Radial Basis Functions, Case-Based Reasoning, Remarks on Lazy and Eager Learning.
Genetic Algorithms – Motivation, Genetic Algorithms, An illustrative Example, Hypothesis Space Search, Genetic Programming, Models of Evolution and Learning, Parallelizing Genetic Algorithms.

UNIT-IV :

Learning Sets of Rules – Introduction, Sequential Covering Algorithms, Learning Rule Sets: Summary, Learning First Order Rules, Learning Sets of First Order Rules: FOIL, Induction as Inverted Deduction, Inverting Resolution

Analytical Learning - Introduction, Learning with Perfect Domain Theories: Prolog-EBG Remarks on Explanation-Based Learning, Explanation-Based Learning of Search Control Knowledge

UNIT-V :

Combining Inductive and Analytical Learning – Motivation, Inductive-Analytical Approaches to Learning, Using Prior Knowledge to Initialize the Hypothesis, Using Prior Knowledge to Alter the Search Objective, Using Prior Knowledge to Augment Search Operators,

Reinforcement Learning – Introduction, The Learning Task, Q Learning, Non-Deterministic, Rewards and Actions, Temporal Difference Learning, Generalizing from Examples, Relationship to Dynamic Programming

TEXT BOOKS:
1. Machine Learning – Tom M. Mitchell, - MGH
2. Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)

REFERENCE BOOKS:
1. Machine Learning Methods in Environmental sciences,Neural Networks WHsieh, Cambridge Univ Press.
2. Richar.O.Duda.Peter E.Hart and David G.Stok,Pattern Classfication, John Wiley and Sons Inc., 2001
3. Chris Bishop. Neural Networks for Pattern Recognition, Oxford university Press,1995

B.Tech. IT	**L**	**T-P-D**	**C**
IV Year – II Semester	0	0-3-0	2

SOFT SKILLS LAB - II
(Common to all Branches)

GROUP DISCUSSION

EXPERIMENT-I: Dynamics of Group discussion—tips for Group Discussion—Traits tested in GD

EXPERIMENT-II: Non-verbal Communication in GD

EXPERIMENT-III: Body language in GD

INTERVIEW SKILLS

EXPERIMENT-IV: Introduction—types of Interview

EXPERIMENT-V: FAQ's in Interview

EXPERIMENT-VI: Reasons for rejecting a candidate

EXPERIMENT-VII: On the day of interview

EXPERIMENT-VIII: common mistakes in interview

EXPERIMENT-IX: Post interview etiquette

EXPERIMENT-X: Dress code and tips for job seekers at interview

EXPERIMENT-XI: Body language in Interview skills

MOCK INTERVIEW

EXPERIMENT-XII: Parameters to evaluate students' performance

TEXT BOOKS:

1. Soft Skills: Know Yourself and Know the World—Dr. K. Alex-S. Chand Publising-2010

REFERENCE BOOKS:

1. Managing Soft skills: K.R. Lakshminarayanan & Murugavel, Scitech Publications-2010