VARDHAMAN COLLEGE OF ENGINEERING

(AUTONOMOUS)

(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)

Shamshabad – 501 218, Hyderabad

BACHELOR OF TECHNOLOGY
COMPUTER SCIENCE AND ENGINEERING

ACADEMIC REGULATIONS, COURSE STRUCTURE AND SYLLABI
UNDER AUTONOMOUS STATUS
FOR THE BATCHES ADMITTED FROM THE ACADEMIC YEAR 2011 - 12

B.Tech. Regular Four Year Degree Programme
(For the batches admitted from the academic year 2011–12)
&
B.Tech. (Lateral Entry Scheme)
(For the batches admitted from the academic year 2012 - 13)

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 undergoing the program) as may be decided by the Academic Council.

PRELIMINARY DEFINITIONS AND NOMENCLATURES

- "Autonomous Institute / College" means an institute / college designated as autonomous institute / college by the Jawaharlal Nehru Technological University, Hyderabad (JNTUH), as per the JNTUH Autonomous College Statutes, 2011.

- "Academic Autonomy" means freedom to a College in all aspects of conducting its academic programs, granted by the University for promoting excellence.

- "Commission" means University Grants Commission.

- "AICTE" means All India Council for Technical Education.

- "University" the Jawaharlal Nehru Technological University, Hyderabad.

- "College" means Vardhaman College of Engineering, Hyderabad unless indicated otherwise by the context.

- "Program" means:
  Bachelor of Technology (B.Tech) degree program
  UG Degree Program: B.Tech

- "Branch" means specialization in a program like B.Tech degree program in Civil Engineering, B.Tech degree program in Computer Science and Engineering etc.

- "Course" or "Subject" means a theory or practical subject, identified by its course – number and course-title, which is normally studied in a semester. For example, ABS11T01: Mathematics - I, ACS11T02: Data Structures through C, etc.

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

FOREWORD

The autonomy is conferred on Vardhaman College of Engineering by J N T University, Hyderabad based on its performance as well as future commitment and competency to impart quality education. It is a mark of its ability to function independently in accordance with the set norms of the monitoring bodies like UGC and AICTE. It reflects the confidence of the affiliating University in the autonomous institution to uphold and maintain standards it expects to deliver on its own behalf and thus awards degrees on behalf of the college. Thus, an autonomous institution is given the freedom to have its own **curriculum, examination system** and **monitoring mechanism**, independent of the affiliating University but under its observance.

Vardhaman College of Engineering is proud to win the credence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, if not improving upon the standards and ethics for which it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTU Hyderabad to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, in accordance with the vision and mission of the college to order to produce a quality engineering graduate to the society.

All the faculty, parents and students are requested to go through all the rules and regulations carefully. Any clarifications needed are to be sought at appropriate time and with principal of the college, without presumptions, to avoid unwanted subsequent inconveniences and embarrassments. The Cooperation of all the stake holders is sought for the successful implementation of the autonomous system in the larger interests of the college and brighter prospects of engineering graduates.

PRINCIPAL

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

(Permanent Affiliation with JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Programme
(for the batches admitted from the academic year 2011 - 12)
&
B.Tech. (Lateral Entry Scheme)
(for the batches admitted from the academic year 2012 - 13)

For pursuing four year undergraduate Bachelor Degree programme of study in Engineering (B.Tech) offered by Vardhaman College of Engineering under Autonomous status and herein after referred to as VCE:

1. APPLICABILITY

All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2011-2012 onwards. Any reference to "College" in these rules and regulations stands for Vardhaman College of Engineering.

2. EXTENT

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

3. ADMISSION

3.1. Admission into first year of four year B.Tech degree programme of study in engineering:

3.1.1. Eligibility:

A candidate seeking admission into the first year of four year B.Tech degree programme should have

(i) Passed either Intermediate Public Examination (I.P.E) conducted by the Board of Intermediate Education, Andhra Pradesh, with Mathematics, Physics and Chemistry as optional subjects or any equivalent examination recognized by Board of Intermediate Education, Andhra Pradesh or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh or equivalent Diploma recognized by Board of Technical Education for admission as per the guidelines of APSCHE.

(ii) Secured a rank in the EAMCET examination conducted by A.P. State Council for Higher Education for allotment of a seat by the Convener, EAMCET, for admission.

3.1.2. Admission Procedure:

Admissions are made into the first year of four year B.Tech. Degree programme as per the stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

(a) Category A seats are filled by the Convener, EAMCET.

(b) Category B seats are filled by the Management.

3.2. Admission into the second year of four year B.Tech degree programme in engineering

3.2.1. Eligibility:
A candidate seeking admission under lateral entry into the III semester B.Tech degree Programme should have passed the qualifying exam (B.Sc. Mathematics & Diploma holders), based on the rank secured by the candidate at Engineering Common Entrance Test ECET (FDH) in accordance with the instructions received from the Convener, ECET and Government of Andhra Pradesh.

3.2.2. Admission Procedure:
Admissions are made into the III semester of four year B.Tech degree programme through Convener, ECET (FDH) against the sanctioned strength in each programme of study as lateral entry students.

4. PROGRAMS OFFERED

Vardhaman College of Engineering, an autonomous college affiliated to JNTUH, offers the following B.Tech programmes of study leading to the award of B.Tech degree under the autonomous scheme.

1) B.Tech (Aeronautical Engineering)
2) B.Tech (Civil Engineering)
3) B.Tech (Computer Science & Engineering)
4) B.Tech (Electrical & Electronics Engineering)
5) B.Tech (Electronics & Communication Engineering)
6) B.Tech (Information Technology)
7) B.Tech (Mechanical Engineering)

5. DURATION OF THE PROGRAMS

5.1 Normal Duration

5.1.1 B.Tech degree program extends over a period of four academic years leading to the Degree of Bachelor of Technology (B.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

5.1.2 For students admitted under lateral entry scheme, B.Tech degree program extends over a period of three academic years leading to the Degree of Bachelor of Technology (B.Tech) of the Jawaharlal Nehru Technology University, Hyderabad.

5.2 Maximum Duration

5.2.1 The maximum period within which a student must complete a full-time academic program is 8 years for B.Tech. If a student fails to complete the academic program within the maximum duration as specified above, he / she will be required to withdraw from the program.

5.2.2 For students admitted under lateral entry scheme in B.Tech degree program, the maximum period within which a student must complete a full-time academic program is 6 years. If a student fails to complete the academic program within the maximum duration as specified above, he / she will be required to withdraw from the program.

5.2.3 The period is reckoned from the academic year in which the student is admitted first time in to the degree programme.

6. SEMESTER STRUCTURE

The College shall follow semester pattern. An academic year shall consist of a first semester and a second semester and the summer term follows in sequence. Each semester shall be of 23 weeks duration and this period includes time for course work, examination preparation, and conduct of examinations. Each semester shall have a minimum of 90 working days. The academic calendar is shown in Table 1 is declared at the start of the semester.

The first and second semesters shall have the duration to accommodate a minimum of 17 instructional weeks per semester.

Table 1: Academic Calendar

FIRST SEMESTER (23 weeks)	I Spell Instruction Period	: 9 weeks	19 weeks
	I Mid Examinations	: 1 week	
	II Spell Instruction Period	: 8 weeks	
	II Mid Examinations	: 1 Week	
	Preparation & Practical Examinations		2 weeks
	External Examinations		2 weeks
Semester Break			2 weeks
SECOND SEMESTER (23 weeks)	I Spell Instruction Period	: 9 weeks	19 weeks
	I Mid Examinations	: 1 week	
	II Spell Instruction Period	: 8 weeks	
	II Mid Examinations	: 1 Week	
	Preparation & Practical Examinations		2 weeks
	External Examinations		2 weeks
Summer Vacation			4 weeks

7. COURSE STRUCTURE

Every programme of study shall be designed to have 42 - 45 theory courses and 14 - 16 laboratory courses.

The Programme of instruction consists of:

(i) A general core programme comprising Basic Sciences, Mathematics, Basic Engineering, Humanities, Social Sciences and Management.

(ii) An Engineering Core programme imparting to the student the fundamentals of engineering in the branch concerned.

(iii) An elective programme enabling the students to take up a group of departmental and interdepartmental courses of interest to him / her.

In addition, a student has to carry out a mini project, project work, technical seminar and comprehensive viva.

Every course of the B Tech programme will be placed in one of the ten groups of courses with minimum credits as listed in the Table 2.

Note: All components prescribed in the curriculum of any programme of study shall be conducted and evaluated.

Contact Periods: Depending on the complexity and volume of the course the number of contact periods per week will be assigned.

Table 2: Group of Courses

S. NO	GROUP OF COURSES	CATEGORY	MINIMUM CREDITS
1	Humanities, Social Sciences and Management	HS	18
2	Basic Sciences	BS	30
3	Basic Engineering	BE	26
4	Core Engineering	CE	114
5	Professional Elective	PE	12
6	Inter Departmental Elective	IE	04
7	Mini Project	MP	02
8	Technical Seminar	TS	02
9	Comprehensive Viva	CV	02
10	Project Work	PW	10
TOTAL			**220**

8. CREDIT BASED SYSTEM

All the academic programs under autonomy are based on credit system. Credits are assigned based on the following norms:

8.1. The duration of each semester will normally be 23 weeks with 6 days a week (the second and fourth Saturdays will be observed as holidays in a month). A working day shall have 6 periods each of 60 minutes duration.

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

- 1 credit per lecture / tutorial period per week.
- 2 credits for three (or more) period hours of practicals.
- 2 credits for mini project.
- 2 credits for technical seminar with 6 periods per week.
- 2 credits for comprehensive viva examination.
- 10 credits for project work with 12 periods per week.

8.2. The four year curriculum of any B.Tech programme of study shall have total of 220 credits. The exact requirements of credits for each course will be as recommended by the Board of Studies concerned and approved by the Academic Council.

In the case of lateral entry students, B.Tech programme for III, IV, V, VI VII and VIII semesters of study shall have a total 168 credits.

8.3. For courses like mini project / project work / technical seminar / comprehensive viva, where formal contact hours are not specified, credits are assigned based on the complexity of the work to be carried out.

9. METHOD OF EVALUATION

The performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks each for theory and 75 marks for practical / computer aided engineering drawing lab. In addition, mini-project, technical seminar, comprehensive viva and project work shall be evaluated for 50, 50, 50 and 200 marks respectively.

9.1 THEORY

For all lecture based theory courses, the evaluation shall be for 25 marks through internal evaluation and 75 marks through external end semester examination of three hours duration.

9.1.1. Internal evaluation

The 25 internal marks are divided as shown in Table 3:

Table 3: Internal marks distribution

Subjective Type Test	20 marks
Assignment / Tutorial	05 marks

For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination consists of subjective test. The subjective test is for 20 marks, with duration of 2 hours. Subjective test of each semester shall contain 5 one mark compulsory questions in part-A and part-B contains 5 questions, the student has to answer 3 questions, each carrying 5 marks.

First midterm examination shall be conducted for the first two and half units of syllabus and second midterm examination shall be conducted for the remaining portion.

The internal marks shall be computed as the average of the two internal evaluations, of two subjective tests.

Five marks are earmarked for assignments. There shall be two assignments in every theory course. Marks shall be awarded considering the average of two assignments in each course.

9.1.2. External Evaluation

The question paper shall be set externally and valued both internally and externally. The external end semester examination question paper in theory subjects will be for a maximum of 75 marks to be answered in three hours duration. There shall be two questions of descriptive type from each unit with internal choice. Each question carries 15 marks. Each theory course shall consist of five units of syllabus.

9.2 PRACTICALS

Practicals shall be evaluated for 75 marks, out of which 50 marks are for external examination and 25 marks are for internal evaluation. The 25 internal marks are distributed as 15 marks for day-to-day work and 10 marks for internal examination. The external end - examination shall be conducted by the teacher concerned and an external examiner from outside the college.

12 out of 14 to 16 experiments / exercises recommended are to be completed in a semester.

9.3. For Engineering Drawing, Advanced Engineering Drawing and Machine Drawing 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 examination. There shall be two internal evaluations in a semester and the average of the two internal evaluations is considered for the award of marks for internal marks.

9.4. The Computer Aided Engineering Drawing Lab, Computer Aided Aircraft Engineering Drawing Lab wherever offered is to be treated as a practical subject. Evaluation method adopted for practical subjects shall be followed here as well.

9.3 Mini Project

The mini project in an industry shall be carried out during the summer break for a minimum of 4 weeks after the VI Semester and completed before the start of the VII semester. A report has to be submitted for assessment to an internal evaluation committee comprising Head of the Department or his / her nominee and two faculty of the department including the project supervisor for 50 marks. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits. The mini project and its report shall be evaluated in VIII semester.

9.4 Technical Seminar

The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work. A hard copy of the information on seminar topic in the form of a report is to be submitted for evaluation along with presentation. The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

9.5 Comprehensive Viva

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. This is aimed at assessing the student's understanding of various subjects studied during the entire program of 4 years. The comprehensive viva shall be evaluated for 50 marks at the end of VIII semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

9.6 Project Work

The project work shall be evaluated for 200 marks out of which 50 marks for internal evaluation and 150 marks for end-semester evaluation. The project work shall be spread over in VII semester and in VIII semester. The project work shall be somewhat innovative in nature, exploring the research bent of mind of the student. A project batch shall comprise of not more than four students.

At the end of VII semester, students should submit synopsis summarizing the work done in VII semester. The project is expected to be completed by the end of VIII semester.

In VIII semester a mid-course review is conducted by Head of the Department and the project supervisor on the progress for 25 marks. On completion of the project a second evaluation is conducted for award of internal marks of another 25 marks before the report is submitted making the total internal marks 50. The end semester examination shall be based on the report submitted and a viva-voce exam for 150 marks by committee comprising of the Head of the Department, project supervisor and an external examiner. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

10. ATTENDANCE REQUIREMENTS TO APPEAR FOR THE SEMESTER-END EXAMINATION

10.1. A student shall be eligible to appear for semester-end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

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

10.3. Shortage of attendance below 65% in aggregate shall in no case be condoned.

10.4. The shortage of attendance shall not be condoned more than twice during the entire course.

10.5. Students whose shortage of attendance is not condoned in any semester are not eligible to take their semester-end examination of that class and their registration shall stand cancelled.

10.6. A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current semester. The student may seek readmission for the semester when offered next. He will not be allowed to register for the subjects of the semester while he is in detention. A student detained due to shortage of attendance, will have to repeat that semester when offered next.

10.7. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

10.8. Attendance may also be condoned as per the recommendations of academic council for those who participate in prestigious sports, co-curricular and extra-curricular activities provided as per the Govt. of AP norms in vogue.

11. EVALUATION

Following procedure governs the evaluation.

11.1. Marks for components evaluated internally by the faculty should be submitted to the Controller of Examinations one week before the commencement of the semester-end examinations. The marks for the internal evaluation components will be added to the external evaluation marks secured in the semester-end examinations, to arrive at total marks for any subject in that semester.

11.2. Performance in all the courses is tabulated course-wise and will be scrutinized by the Examination Committee and moderation is applied if needed, based on the recommendations of moderation committee and course-wise marks lists are finalized.

11.3. Student-wise tabulation is done and student-wise memorandum of marks is generated which is issued to the student.

12. PERSONAL VERIFICATION

Students shall be permitted for personal verification of the semester-end examination answer scripts within a stipulated period after payment of prescribed fee.

13. SUPPLEMENTARY EXAMINATION

Supplementary examinations for the odd semester shall be conducted with the regular examinations of even semester and vice versa, for those who appeared and failed in regular examinations. Such of the candidates writing supplementary examinations may have to write more than one examination per day.

14. ACADEMIC REQUIREMENTS FOR PROMOTION / COMPLETION OF REGULAR B.TECH PROGRAMME OF STUDY

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion / completion of regular B.Tech programme of study.

FOR STUDENTS ADMITTED INTO B.TECH. (REGULAR) PROGRAMME

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project, if he secures not less than 35% of marks in the semester-end examination and a minimum of 40% of marks in the sum of the internal evaluation and semester - end examination taken together.

ii. In case of mini project, technical seminar and comprehensive viva a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if he/she secures not less than 40% of marks.

iii. In case of project work, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted if he/she secures not less than 40% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.

iv. A student shall be promoted from IV semester to V semester of programme of study only if he fulfils the academic requirement of securing 40 credits from the examinations held up to end of III semester including supplementary examinations.

v. A student shall be promoted from VI semester to VII semester of programme of study only if he fulfils the academic requirements of securing 68 credits out of which all 52 from I and II semesters shell be completed, from the examinations held up to V semester including supplementary examinations.

vi. A student shall register for all the 220 credits and earn all the 220 credits. Marks obtained in all the 220 credits shall be considered for the award of the class based on aggregate of marks.

vii. A student who fails to earn 220 credits as indicated in the course structure within **eight** academic years from the year of their admission shall forfeit their seat in B.Tech programme and their admission stands cancelled.

viii. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

FOR LATERAL ENTRY STUDENTS (BATCHES ADMITTED FROM 2012–2013)

i. A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35% of marks in the semester-end examination and a minimum of 40% of marks in the sum total of the internal evaluation and semester-end examination taken together.

ii. In case of mini project, technical seminar and comprehensive viva a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each of them if he/she secures not less than 40% of marks.

iii. In case of project work, a student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted if he/she secures not less than 40% of marks on the aggregate in the internal evaluation and external end-evaluation taken together.

iv. A student shall be promoted from VI semester to VII semester only if he fulfils the academic requirements of securing 42 credits from the examinations held up to V semester including supplementary examinations.

v. A student shall register for all 168 credits and earn all the 168 credits. Marks obtained in all 168 credits shall be considered for the award of the class based on aggregate of marks.

vi. A student who fails to earn 168 credits as indicated in the course structure within **six** academic years from the year of their admission shall forfeit their seat in B.Tech programme and their admission stands cancelled.

vii. Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the

date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. However, all such readmitted students shall earn all the credits of subjects they have pursued for completion of the course.

15. TRANSITORY REGULATIONS

Students who are detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered, and pursue the remaining course work with the academic regulations of the batch into which such students are readmitted. A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

16. TRANSCRIPTS

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee. Partial transcript will also be issued upto any point of study to a student on request, after payment of requisite fee.

17. AWARD OF DEGREE

The degree will be conferred and awarded by Jawaharlal Nehru Technological University, Hyderabad on the recommendations of the Chairman, Academic Council.

17.1. Eligibility: A student shall be eligible for the award of B.Tech. Degree, if he fulfills all the following conditions:

- Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.
- Obtained not less than 40% of marks (minimum requirement for declaring as passed).
- Has no dues to the college, hostel, and library etc. and to any other amenities provided by the College.
- No disciplinary action is pending against him.

17.2. AWARD OF CLASS

Declaration of Class is based on percentage of marks to be secured.

After a student has satisfied the requirement prescribed for the completion of the programme and is eligible for the award of B.Tech. Degree he shall be placed in one of the following four classes Shown in Table 4:

Table 4: Declaration of Class is based on percentage of marks to be secured

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for the 220 Credits.
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%	
Fail	Below 40%	

Sometimes, it is necessary to provide equivalence of percentages and/or *Class* awarded with *Grade Point Average (GPA).* This shall be done by prescribing certain specific thresholds in averages for *Distinction, First Class and Second Class,* as in Table 5.

Table 5: Percentage Equivalence of *Grade Points* (For a 10-Point Scale)

Grade Point	Percentage of Marks / Class
4.75	40 (Pass Class)
5.25	45
5.75	50 (Second Class)
6.25	55
6.75	60 *(First Class)*
7.25	65
7.75	70 *(First Class with Distinction)*
8.25	75

18. ADDITIONAL ACADEMIC REGULATIONS

i. Courses like projects / mini projects / seminars can be repeated only by re-registering for all the components in that semester.

ii. When a student is absent for any examination (internal or external) he is treated as to have obtained absent in that component (course) and aggregate of marks is done accordingly.

iv. When a component is cancelled as a penalty, he is awarded zero marks in that component.

19. REGISTRATION

Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the Academic Calendar. It is absolutely compulsory for the student to register for courses in time.

20. TERMINATION FROM THE PROGRAM

The admission of a student to the program may be terminated and the student is asked to leave the college in the following circumstances:

i. The student fails to satisfy the requirements of the program within the maximum period stipulated for that program.

ii. The student fails to satisfy the norms of discipline specified by the institute from time to time.

21. CURRICULUM

21.1 For each program being offered by the Institute, a Board of Studies (BOS) is constituted in accordance with AICTE / UGC / JNTUH statutes.

21.2. The BOS for a program is completely responsible for designing the curriculum once in three years for that program.

22. WITH-HOLDING OF RESULTS

If the candidate has not paid any dues to the college / if any case of indiscipline / malpractice is pending against him, the results of the candidate will be withheld. The issue of the degree is liable to be withheld in such cases.

23. GRIEVANCES REDRESSAL COMMITTEE

"Grievance and Redressal Committee" (General) constituted by the principal shall deal with all grievances pertaining to the academic / administrative / disciplinary matters. The composition of the complaints cum redressal committee shall be:

Headed by Senior Faculty member
Heads of all departments
A senior lady staff member from each department (if available)

The committee constituted shall submit a report to the principal of the college, the penalty to be imposed. The Principal upon receipt of the report from the committee shall, after giving an opportunity of being heard to the person complained against, submit the case with the committee's recommendation to the Governing Body of the college. The Governing Body shall confirm with or without modification the penalty recommended after duly following the prescribed procedure.

24. MALPRACTICE PREVENTION COMMITTEE

A malpractice prevention committee shall be constituted to examine and punish the students who does malpractice / behaves indiscipline in examinations. The committee shall consist of:

Principal.
Subject expert of which the subject belongs to.
Head of the department of which the student belongs to.
The invigilator concerned.
In-charge Examination branch of the college.

The committee constituted shall conduct the meeting on the same day of examination or latest by next working day to the incidence and punish the student as per the guidelines prescribed by the J N T University, Hyderabad from time to time.

Any action on the part of candidate at the examination like trying to get undue advantage in the performance at examinations or trying to help another, or derive the same through unfair means is punishable according to the provisions contained hereunder. The involvement of the Staff, who are in charge of conducting examinations, valuing examination papers and preparing / keeping records of documents relating to the examinations in such acts (inclusive of providing incorrect or misleading information) that infringe upon the course of natural justice to one and all concerned at the examination shall be viewed seriously and recommended for award of appropriate punishment after thorough enquiry.

25. AMENDMENTS TO REGULATIONS

The Academic Council of Vardhaman College of Engineering reserves the right to revise, amend, or change the regulations, scheme of examinations, and / or syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

26. STUDENTS' FEEDBACK

It is necessary for the Colleges to obtain feedback from students on their course work and various academic activities conducted. For this purpose, suitable feedback forms shall be devised by the College and the feedback obtained from the students regularly in confidence, by administering the feedback form in print or on-line in electronic form.

The feedback received from the students shall be discussed at various levels of decision making at the College and the changes/ improvements, if any, suggested shall be given due consideration for implementation.

27. GRADUATION DAY

The College shall have its own annual *Graduation Day* for the award of Degrees to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute.

The College shall institute Prizes and Awards to meritorious students, for being given away annually at the *Graduation Day.* This will greatly encourage the students to strive for excellence in their academic work.

28. AWARD OF A RANK UNDER AUTONOMOUS SCHEME

28.1. Merit Rank will be declared only for those students who have been directly admitted in VCE under Autonomous Regulations and complete the entire course in VCE only within the minimum possible prescribed time limit, i.e., 4 years for B.Tech, 3 years for B.Tech under lateral entry scheme.

28.2. A student shall be eligible for a merit rank at the time of award of degree in each branch of Bachelor of Technology, provided the student has passed all subjects prescribed for the particular degree program in first attempt only.

28.3. Academic performance will be the sole criteria for awarding the merit rank and will be based only on performance of the student from the first to the eighth semester of the course.

28.4. The number of Merit Ranks to be announced for any course / program / branch / specialisation will be as follows:

- **3** (Three) Merit Ranks if the AICTE sanctioned intake is less than or up to 60.
- **4** (Four) Merit Ranks if the AICTE sanctioned intake is greater than 60.
- **5** (Five) Merit Ranks if the AICTE sanctioned intake is greater than 120.

28.5. Award of prizes, scholarships, or any other Honours shall be based on the rank secured by a candidate, consistent with the guidelines of the Donor, wherever applicable.

29. CONDUCT AND DISCIPLINE

29.1 Each student shall conduct himself / herself in a manner befitting his / her association with VCE.

29.2 He / she is expected not to indulge in any activity, which is likely to bring disrepute to the college.

29.3 He / she should show due respect and courtesy to the teachers, administrators, officers and employees of the college and maintain cordial relationships with fellow students.

29.4 Lack of courtesy and decorum unbecoming of a student (both inside and outside the college), wilful damage or removal of Institute's property or belongings of fellow students, disturbing others in their studies, adoption of unfair means during examinations, breach of rules and regulations of the Institute, noisy and unruly behaviour and similar other undesirable activities shall constitute violation of code of conduct for the student.

29.5 **Ragging in any form is strictly prohibited and is considered a serious offence. It will lead to the expulsion of the offender from the college.**

29.6 Violation of code of conduct shall invite disciplinary action which may include punishment such as reprimand, disciplinary probation, debarring from the examination, withdrawal of placement services, withholding of grades / degrees, cancellation of registration, etc., and even expulsion from the college.

29.7 Principal, based on the reports of the warden of Institute hostel, can reprimand, impose fine or take any other suitable measures against an inmate who violates either the code of conduct or rules and regulations pertaining to college hostel.

29.8 A student may be denied the award of degree / certificate even though he / she has satisfactorily completed all the academic requirements if the student is found guilty of offences warranting such an action.

29.9 Attendance is not given to the student during the suspension period.

30. OTHER ISSUES

The quality and standard of engineering professionals are closely linked with the level of the technical education system. As it is now recognized that these features are essential to develop the intellectual skills and knowledge of these professionals for being able to contribute to the society through productive and satisfying careers as *innovators, decision makers and/or leaders* in the global economy of the 21st century, it becomes necessary that certain improvements are introduced at different stages of their education system. These include:

a. Selective admission of students to a programme, so that merit and aptitude for the chosen technical branch or specialization are given due consideration.

b. Faculty recruitment and orientation, so that qualified teachers trained in good teaching methods, technical leadership and students' motivation are available.

c. Instructional/Laboratory facilities and related physical infrastructure, so that they are adequate and are at the contemporary level.

d. Access to good library resources and Information & Communication Technology **(ICT)** facilities, to develop the student's *mind* effectively.

These requirements make it necessary for the College to introduce improvements like:

a. Teaching-learning process on modern lines, to provide *Add-On* Courses for *audit*/credit in a number of peripheral areas useful for students' self development.

b. Life-long learning opportunities for faculty, students and alumni, to facilitate their dynamic interaction with the society, industries and the world of work.

c. Generous use of ICT and other modern technologies in everyday activities.

31. GENERAL

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

Note: Failure to read and understand the regulations is not an excuse.

COURSE STRUCTURE

B. TECH - COMPUTER SCIENCE AND ENGINEERING

REGULATIONS: VCE-R11

I SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1008	Technical English	HS	4	-	-	4	25	75	100
A1001	Mathematics - I	BS	3	1	-	4	25	75	100
A1005	Probability, Statistics and Computational Techniques	BS	3	1	-	4	25	75	100
A1004	Environmental Science	BS	4	-	-	4	25	75	100
A1501	Computer Programming	BE	4	-	-	4	25	75	100
A1009	English Language Communication Skills Lab	HS	-	-	3	2	25	50	75
A1502	Computer Programming Lab	BE	-	-	3	2	25	50	75
A1601	PC Software Lab	BE	-	2	3	2	25	50	75
TOTAL			**18**	**04**	**09**	**26**	**200**	**525**	**725**

II SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1007	Mathematics – II	BS	3	1	-	4	25	75	100
A1002	Engineering Physics	BS	4	-	-	4	25	75	100
A1003	Engineering Chemistry	BS	4	-	-	4	25	75	100
A1503	Data Structures through C	BE	4	-	-	4	25	75	100
A1201	Basic Electrical Engineering	BE	3	1	-	4	25	75	100
A1010	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A1504	Data Structures through C Lab	BE	-	-	3	2	25	50	75
A1305	Computer Aided Engineering Drawing Lab	BE	-	2	3	2	25	50	75
TOTAL			**18**	**04**	**09**	**26**	**200**	**525**	**725**

III SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1013	Managerial Economics and Financial Analysis	HS	4	-	-	4	25	75	100
A1205	Elements of Electrical Engineering	BE	4	-	-	4	25	75	100
A1404	Digital Logic Design	CE	3	1	-	4	25	75	100
A1405	Electronic Devices and Circuits	BE	3	1	-	4	25	75	100
A1505	Discrete Mathematical Structures	CE	3	1	-	4	25	75	100
A1506	Object Oriented Programming through JAVA	BE	4	-	-	4	25	75	100
A1407	Analog and Digital Electronics Lab	BE	-	-	3	2	25	50	75
A1507	JAVA Programming Lab	BE	-	-	3	2	25	50	75
TOTAL			**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - COMPUTER SCIENCE AND ENGINEERING

REGULATIONS: VCE-R11

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1508	Operating Systems	CE	4	-	-	4	25	75	100
A1509	Computer Architecture and Organization	CE	3	1	-	4	25	75	100
A1510	Theory of Computation	CE	4	-	-	4	25	75	100
A1603	Web Technologies	CE	3	1	-	4	25	75	100
A1604	Computer Graphics	CE	4	-	-	4	25	75	100
A1511	Database Management Systems	CE	3	1	-	4	25	75	100
A1605	Computer Graphics and Web Technologies Lab	CE	-	-	3	2	25	50	75
A1512	Database Management Systems Lab	CE	-	-	3	2	25	50	75
TOTAL			**21**	**03**	**06**	**28**	**200**	**550**	**750**

V SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1423	Microprocessors and Interfacing	CE	4	-	-	4	25	75	100
A1513	Software Engineering	CE	3	1	-	4	25	75	100
A1514	Unix Programming	CE	4	-	-	4	25	75	100
A1515	Computer Networks	CE	3	1	-	4	25	75	100
A1516	Systems Programming	CE	3	1	-	4	25	75	100
A1517	Design and Analysis of Algorithms	CE	4	-	-	4	25	75	100
A1427	Microprocessors and Interfacing Lab	CE	-	-	3	2	25	50	75
A1518	Unix Programming Lab	CE	-	-	3	2	25	50	75
TOTAL			**21**	**03**	**06**	**28**	**200**	**550**	**750**

VI SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1430	Embedded Systems	CE	4	-	-	4	25	75	100
A1606	Network Security and Cryptography	CE	3	1	-	4	25	75	100
A1519	Language Processors	CE	4	-	-	4	25	75	100
A1520	Object Oriented Design and Patterns	CE	3	1	-	4	25	75	100
A1521	C # and .NET Framework	CE	3	1	-	4	25	75	100
INTERDEPARTMENTAL ELECTIVE - I		HS	4	-	-	4	25	75	100
A1522	Object Oriented Design and Patterns Lab	CE	-	-	3	2	25	50	75
A1523	C # and .NET Framework Lab	CE	-	-	3	2	25	50	75
TOTAL			**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - COMPUTER SCIENCE AND ENGINEERING

REGULATIONS: VCE-R11

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1605	Wireless and Mobile Computing	CE	4	-	-	4	25	75	100
A1524	Software Project Management	CE	4	-	-	4	25	75	100
A1525	Software Testing and Quality Assurance	CE	4	-	-	4	25	75	100
A1526	Data Mining and Data Warehousing	CE	3	1	-	4	25	75	100
INTERDEPARTMENTAL ELECTIVE - II		IE	4	-	-	4	25	75	100
PROFESSIONAL ELECTIVE - I		PE	3	1	-	4	25	75	100
A1530	Software Testing and Quality Assurance Lab	CE	-	-	3	2	25	50	75
A1531	Data Mining and Data Warehousing Lab	CE	-	-	3	2	25	50	75
A1532	Project Work (Stage - I)	PW	-	2	-	-	-	-	-
TOTAL			**22**	**04**	**06**	**28**	**200**	**550**	**750**

VIII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1015	Industrial Management and Psychology	HS	3	1	-	4	25	75	100
PROFESSIONAL ELECTIVE - II		PE	3	1	-	4	25	75	100
PROFESSIONAL ELECTIVE - III		PE	3	1	-	4	25	75	100
A1542	System Analysis and Design Lab	CE	-	-	6	2	25	50	75
A1543	Technical Seminar	TS	-	-	6	2	50	-	50
A1544	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1545	Mini Project	MP	-	-	-	2	50	-	50
A1532	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
TOTAL			**09**	**03**	**24**	**28**	**250**	**500**	**750**

ELECTIVES	
INTERDEPARTMENTAL ELECTIVE - I	
Code	**Subject**
A1016	Human Values and Ethics
A1017	Human Resource Management
A1018	Entrepreneurship
A1019	Business Communication
A1020	Intellectual Property and Patent Rights
A1021	Project Planning and Management
INTERDEPARTMENTAL ELECTIVE – II	
A1610	Image Processing
A1222	Power Electronics
A1429	VLSI design
A1337	Robotics
A1148	Air Pollution and Control Methodologies
A1701	Introduction to Aircraft Industry
PROFESSIONAL ELECTIVE - I	
A1331	Operations Research
A1608	Building Enterprise Applications
A1609	Bioinformatics
A1527	Rational Application Developer
A1528	Advanced Computer Architecture
A1529	Distributed Operating Systems
PROFESSIONAL ELECTIVE - II	
A1611	Grid And Cloud Computing
A1533	Business Intelligence and Analytics
A1534	Artificial Intelligence
A1535	Natural Language processing
A1536	Distributed Databases
A1537	Multi-Core Architecture and Programming
PROFESSIONAL ELECTIVE - III	
A1616	Information Retrieval System
A1617	Semantic Web and Social Networks
A1538	Fault Tolerant Computing
A1539	Game Development Using CUDA
A1540	Software Architecture
A1541	Soft Computing

SYLLABI FOR I SEMESTER

B. Tech. CSE I SEMESTER

TECHNICAL ENGLISH
(Common to CSE, IT & ECE)

Course Code: **A1008**

L	T	P	C
4	-	-	4

UNIT - I

1. ***Sir CV Raman: A Path breaker in the Saga of Indian Science*** from E*njoying Every Day English*
2. ***Mother Teresa*** from *Inspiring Speeches and Lives*

FOCUSING ON Word formation with prefixes and suffixes, synonyms and antonyms, noun phrases, infinitive and gerund, subject-verb agreement (concord), tenses, impersonal passive conditional sentences, adjectives and degrees of comparison, conjunctions and prepositions.

UNIT - II

1. ***The Connoisseur*** from E*njoying Every Day English*
2. ***Sam Pitroda*** from *Inspiring Speeches and Lives*

FOCUSING ON Word formation with prefixes and suffixes, synonyms and antonyms, noun phrases, infinitive and gerund, subject-verb agreement (concord), tenses, impersonal passive conditional sentences, adjectives and degrees of comparison, conjunctions and prepositions.

UNIT - III

1. ***Bubbling Well Road*** from E*njoying Every Day English*
2. ***I Have a Dream*** **- by Martin Luther King** from *Inspiring Speeches and Lives*

FOCUSING ON Word formation with prefixes and suffixes, synonyms and antonyms, noun phrases, infinitive and gerund, subject-verb agreement (concord), tenses, impersonal passive conditional sentences, adjectives and degrees of comparison, conjunctions and prepositions.

UNIT - IV

LETTERS, MEMOS AND E-MAIL: Letters, business letters, significance, structure and layout, principles, types and samples, claim letters, adjustment letters, sales letters, job application letters, memos, classification and purpose style, E-mails, E-mail etiquettes, sample E- mail messages, effectiveness and security.

UNIT - V

REPORTS: Objectives, characteristics of a report, types of reports, importance of reports, formats, rewriting structure of reports, writing the report, visual aids, revising, editing and proof reading, proof reading symbols.

TEXT BOOKS:

1. Ramakrishna Rao. A (2009), *Enjoying Every Day English,* Sangam Books, Hyderabad.
2. Yadava Raju. B and Muralikrishna. C (2009), *Inspiring Speeches and Lives,* Maruthi Publications, Guntur.
3. Meenakshi Raman, Sangeeta Sharma (2009), *Technical Communication,* Oxford University Press, New Delhi.

REFERENCE BOOKS:

1. Edgar Thorpe and Showick Thorpe (2008), Basic *Vocabulary for Competitive Examination,* Pearson Education, New Delhi, India.
2. Ashraf Rizvi M (2005), *Effective Technical Communication,* Tata Mc Graw Hill, New Delhi.
3. Raymond Murphy (2004), *Murphy's English Grammar with CD,* 3rd Edition, Cambridge University Press, USA.

B. Tech. CSE I SEMESTER

MATHEMATICS – I
(Common to all Branches)

Course Code: **A1001**

L	T	P	C
3	1	-	4

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 and orthogonal trajectories.

UNIT - II

HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS: Linear differential equations of second and higher order with constant coefficients, RHS term of the type $Q(x)= e^{ax}$, sinax, cosax, and x^n, $e^{ax}V(x)$, $x^nV(x)$, method of variation of parameters. Applications to electrical circuits, simple harmonic motion.

UNIT - III

FUNCTIONS OF SINGLE VARIABLE AND THEIR APPLICATIONS AND MULTIPLE INTEGRALS: Rolle's Theorem, Lagrange's mean value theorem, Cauchy's mean value theorem, generalized mean value theorem (all theorems without proof), functions of several variables, functional dependence, Jacobian - maxima and minima of functions of two variables with and without constraints. Radius, centre and circle of curvature – evolutes and envelopes. Multiple integrals, double and triple integrals, change of order of integration, change of variables

UNIT - IV

LAPLACE TRANSFORMS: Laplace transform of standard functions, inverse transform, first shifting theorem, transforms of derivatives and integrals, unit step function, second shifting theorem, Dirac's delta function, convolution theorem, periodic function, differentiation and integration of transforms, application of Laplace transforms to ordinary differential equations.

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 function. Vector integrals theorems: Green's - Stoke's and Gauss's divergence theorems (statement & their verification).

TEXT BOOKS:

1. Grewal B.S (2007), *Higher Engineering Mathematics*, 40th Edition, Khanna Publishers, New Delhi.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), *Engineering Mathematics Vol - I*, 10th Revised Edition, S. Chand & Company Limited, New Delhi.

REFERENCE BOOKS:

1. Jain R. K, Iyengar S. R. K (2008), *Advanced Engineering Mathematics,* 3rd edition, Narosa Publication House, New Delhi.
2. Shahanaz Bathul (2007), *Engineering Mathematics-I*, 3rd Edition, Right Publishers, Hyderabad.
3. Ramana B.V (2010), *Engineering Mathematics*, Tata McGraw Hill Publishing Co. Limited, New Delhi.

PROBABILITY, STATISTICS AND COMPUTATIONAL TECHNIQUES
(Common to CSE, IT, AE & CE)

Course Code: **A1005**

L	T	P	C
3	1	-	4

UNIT - I

PROBABILITY, RANDOM VARIABLES AND DISTRIBUTIONS: Sample space and events, probability, the axioms of probability. Random variables, Discrete distribution, Continuous distribution, Binomial distribution, Poisson distribution, Normal distribution, Normal approximation to Binomial distribution.

UNIT - II

TESTING OF HYPOTHESIS: Tests of hypothesis point estimations, interval estimations. Large samples, null hypothesis, alternative hypothesis type i & type ii errors, critical region, confidence interval for mean, difference between the means, single proportion and difference of proportions. Confidence interval for the T-distribution, tests of hypothesis - T-distributions, F-distribution and Chi-square distribution.

UNIT - III

SOLUTIONS OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS: Bisection method, Regular Falsi method, Iteration method, Newton Raphson method.

INTERPOLATION: Newton's forward interpolation, Newton's backward interpolation, interpolation with unequal intervals, Lagrange's interpolation, Newton's divided difference interpolation. Derivatives using Newton's forward formula, derivatives using Newton's backward formula.

UNIT - IV

CURVE FITTING AND NUMERICAL INTEGRATION: *Curve fitting*: Fitting a straight line, second degree curve, exponential curve, power curve by method of least squares. Numerical integration, Newton cote's formula, Trapezoidal rule, Simpson's 1/3 rule, Simpson's 3/8 rule.

UNIT - V

NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS: Single step methods: Taylor's series method - Euler's and modified Euler's methods - fourth order Runge-Kutta method for solving first and second order equations-multistep methods: Milne's and Adam's, predictor and corrector methods.

TEXT BOOKS:

1. Grewal B.S (2007), *Higher Engineering Mathematics*, 40th edition, Khanna Publishers, New Delhi.
2. Iyengar T. K. V., Krishna Gandhi B. & Others (2011), *Probability and Statistics*, 3rd Revised Edition, S. Chand & Company Limited, New Delhi.

REFERENCE BOOKS:

1. Iyengar T. K. V., Krishna Gandhi B. & Others (2011), *Mathematical Methods*, 6th Revised Edition, S. Chand & Company Limited, New Delhi.
2. Bali N. P, Narayana Iyengar N. Ch (2004), *A Textbook of Engineering Mathematics*, 6th edition, Laxmi Publications, New Delhi.
3. Sastry S. S (2005), *Introductory Methods of Numerical Analysis*, 4th Edition, Prentice Hall of India Learning Pvt. Ltd, New Delhi.

B. Tech. CSE I SEMESTER

ENVIRONMENTAL SCIENCE
(Common to CSE, IT & ECE)

Subject Code: **A1004**

L	T	P	C
4	-	-	4

UNIT - I

ENVIRONMENTAL SCIENCE INTRODUCTION AND NATURAL RESOURCES: *Introduction:* Multidisciplinary nature of environmental studies: definition, scope and importance, need for public awareness. *Natural Resources:* Renewable and non-renewable resources .Natural resources and associated problems. *Forest Resources:* Use and over - exploitation, deforestation, timber extraction, mining, dams and other effects on forest and tribal people. *Water Resources:* Use and over utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. *Mineral Resources:* Use and exploitation, environmental effects of extracting and using mineral resources. *Food Resources:* World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, Organic farming and Food miles. *Energy Resources:* Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, Case studies. *Land Resources:* Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT - II

ECOSYSTEM AND BIODIVERSITY: *Ecosystems:* Concept of an ecosystem, structure and function of an ecosystem, producers, consumers and decomposers. Energy flow in the ecosystem - ecological succession, food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: forest ecosystem, grassland ecosystem, desert ecosystem, aquatic ecosystems (ponds, streams, lakes, rivers, oceans and estuaries). *Biodiversity and Its Conservation:* Introduction - definition: genetic, species and ecosystem diversity, value of biodiversity- consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, national and local levels. India as mega diversity nation, hot-sports of biodiversity, threats to biodiversity- habitat loss, poaching of wildlife, man -wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity- in-situ and ex-situ conservation of biodiversity.

UNIT - III

ENVIRONMENTAL POLLUTION, GLOBAL ENVIRONMENTAL ISSUES AND CONTROL MEASURES: *Environmental Pollution:* definition, cause, effects and control measures of air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution and nuclear hazards. *Solid Waste Management*: Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution, pollution case studies. *Disaster Management*: Floods, earthquake, cyclone and landslides. E-waste and plastic waste - recycling and reuse. *Social Issues and the Environment*: From unsustainable to sustainable development, urban problems related to energy. *Water Conservation*: Rain water harvesting, watershed management, resettlement and rehabilitation of people; its problems and concerns, case studies, climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case Studies, wasteland reclamation.

UNIT - IV

GREEN ENVIRONMENTAL ISSUES: Introduction, Clean development mechanism, Carbon foot printing, Carbon credits, Carbon sequestration, Polluter pay principle. Green building, practices, approaches to green computing, Nanotechnology IS014000. Role of Information Technology in environment and human health, case studies.

UNIT - V

ENVIRONMENTAL ETHICS, ENVIRONMENTAL IMPACT ASSESMENT & ROLE OF NGOs: *Environmental Ethics:* Environment protection act, air (prevention and control of pollution) act, water (prevention and control of pollution) act, wildlife protection act, forest conservation act, issues involved in enforcement of environmental, legislation, public awareness. *Environmental Impact Assesment*: Conceptual facts of EIA, baseline date acquisition, planning and management of impact studies, operational aspects of EIA, methods for impact identification, prediction of impacts(air, water, noise, soil, biological and socio-economics), environmental management plan, role of NGOs in creating awareness among people regarding environmental issues.

TEXT BOOKS:

1. Benny Joseph (2005), *Environmental Studies*, Tata McGraw Hill Publishing Company Limited, New Delhi.
2. Erach Bharucha (2005), *Textbook of Environmental Studies for Undergraduate Courses*, Universities Press, Hyderabad.

REFERENCE BOOKS:

1. Anji Reddy. M (2007), Textbook of Environmental Sciences and Technology, BS Publications, Hyderabad.
2. Rajagopalan. R (2009), Environmental Studies, Oxford University Press, New Delhi.
3. Anubha Kaushik (2006), Perspectives in Environmental Science, 3rd Edition, New age international, New Delhi.

B. Tech. CSE I SEMESTER

COMPUTER PROGRAMMING
(Common to CSE, IT, ECE & EEE)

Course Code: **A1501**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO COMPUTERS: Introduction to computers, computer systems, computing environments, computer languages, creating and running programmes, software development method, algorithms, pseudo code, flow charts, applying the software development method.

INTRODUCTION TO C LANGUAGE: Basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values

OPERATORS AND EXPRESSIONS: Statements, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bitwise operators, type conversions, expressions and evaluation, input and output statements, sample programs.

UNIT - II

CONTROL STATEMENTS: If and switch statements, while, do while and for statements, sample programs.

FUNCTIONS: Defining and accessing, passing arguments, function prototypes, library functions, static functions, user defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, example C programs.

ARRAYS: Defining and processing, one dimensional and two dimensional arrays, initialization, passing arrays to a function, multi dimensional arrays, command line arguments.

UNIT - III

STRINGS: Defining and operations on strings, string variables declaration, reading, writing. Basics of functions, parameter passing, string handling functions.

POINTERS: Basic Concepts, pointer to pointer, passing pointers to a function, operations on pointers, pointer arithmetic, pointers and arrays, arrays of pointers, function pointers, dynamic memory allocation.

UNIT - IV

STRUCTURES AND UNIONS: Structure definition, initializing, assigning values, passing of structures as arguments, arrays of structures, pointers to structures, self reference to structures, unions, typedef, bit fields, sample programs.

UNIT - V

CONSOLE AND FILE I/O: File, types of files, file vs. console, file structure, file attributes, file operations, standard I/O, formatted I/O, sample programs.

TEXT BOOKS:

1. B. A. Fouruzan and R. F. Gilberg (2006), *Computer Science: A structured programming approach using C,* 3rd edition, Thomson Publications, New Delhi.
2. Yashawanth Kanethkar (2008), *Let us C*, 8th edition, Jones & Bartlett Publishers, India.

REFERENCE BOOKS:

1. Herbert Schildt (2000), *C: The Complete Reference*, 4th Edition, New Delhi, Osborne Mc Graw Hill.
2. B. W. Kerninghan, Dennis M. Ritche (1988), *The C Programming Language*, 2nd edition, Prentice Hall Software Series, India.
3. Stephen G.Kochan (2004), *Programming in C*, 3rd Edition, Pearson Education Private Limited.

B. Tech. CSE I SEMESTER

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common to CSE, IT & ECE)

Course Code: **A1009**

L	T	P	C
-	-	3	2

The Language lab focuses on the production and practice of sounds of language and familiarizes the students with the use of English in everyday situations and contexts.

SYLLABUS:

The following course content is prescribed for the English Language Laboratory sessions:

1. Introduction to phonetics
2. Sounds of English- vowels, diphthongs & consonants
3. Introduction to stress and intonation
4. Oral presentations- prepared
5. Oral Presentations- Extempore
6. Situational dialogues / role play
7. 'Just A Minute' sessions (JAM)
8. Information transfer
9. Telephoning skills
10. Describing objects, situations and people
11. Giving directions
12. Listening for specific information
13. Listening to record telephone conversations
14. Debate

SUGGESTED SOFTWARE:

- Cambridge advanced learners' English dictionary with cd.
- The Rosetta stone English library.
- Clarity pronunciation power – part I.
- Oxford advanced learner's compass, 7th Edition.
- Learning to speak English - 4 CDs.
- Vocabulary in use, Michael McCarthy, felicity o'den, Cambridge.
- Murphy's English grammar, Cambridge with CD.

REFERENCE BOOKS:

1. Suresh Kumar. E. & Sreehari P.A *(*2007), *Handbook for English Language Laboratories,* Cambridge University Press India Pvt. Ltd, New Delhi.
2. Mandal S. K (2006), *Effective Communication & Public Speaking*, Jaico Publishing House, New Delhi.
3. Grant Taylor (2004), *English Conversation Practice,* Tata McGraw Hill, New Delhi.
4. Balasubramanian .T (2000), *A text book of English Phonetics for Indian Student, Mac* Millan Publishers, India.
5. Kamalesh Sadanand, Susheela Punitha (2008), *Spoken English: A foundation Course: Parts 1 & 2,* New Delhi, Orient Longman Pvt. Ltd.

B. Tech. CSE I SEMESTER

COMPUTER PROGRAMMING LAB
(Common to CSE, IT, ECE & EEE)

Course Code: **A1502**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. To write C programs for the following:
   a) Sum of individual digits of a positive integer.
   b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence.
   Write a C program to generate to generate the first n terms of the Fibonacci sequence.

2. a) To write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user
   b) To write a C program to calculate the following sum:
   Sum=1+x2/2!+X4/4! ————— upto given 'n' terms.
   c) To write a C program to find the roots of a quadratic equation.

3. To write C programs that uses both recursive and non-recursive functions
   a) To find the factorial of a given number.
   b) To find the GCD (greatest common divisor) of two given integers.
   c) To solve Towers of Hanoi problem.

4. The total distance traveled by vehicle in 't' seconds is given by distance=ut+1/2at2 where 'u' and 'a are the initial velocity (m/sec) and acceleration (m/sec2). Write a C program to find the distance traveled at regular intervals of time given values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.

5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, *, and %).

6. Write a C program to find the largest and smallest number in a list of integers.

7. Write a C program that uses functions to perform the following
   a. Addition of Two Matrices
   b. Multiplication of Two Matrices

8. Write a C program that uses functions to perform the following operations
   a. To insert a sub-string in to given main string from a given position
   b. To delete n characters from a given position in given string.

9. Write a C program to determine if the given string is a palindrome or not.

10. a) Write a C program that displays the position or index in the string S where the string T begins, or -1 if S does not contain T.
    b) Write a C program to count the lines, words and characters in a given text.

11. To write a C program
    a) To generate Pascal's triangle
    b) To construct a pyramid of numbers

12. To write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression 1+x+x2+x3+…xn
    For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum. Perform error checking. For example the formula does not make sense for negative
    Exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the nest pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

13. To write a C program
    a) To find the 2's compliments of a binary number.
    b) To convert a Roman numeral to its decimal equivalent

14. To write a C program that uses functions to perform the following operations
    a. Reading a complex number
    b. Writing a complex number
    c. Addition of 2 complex numbers
    d. Multiplication of 2 complex numbers
    (Note: represent complex number using a structure)

15. To write a C program
    a) To copy the contents from one file to another.
    b) To reverse the first n characters in a file.
    (Note: the file name and n are specified on the command line)
    c) To fine the no. of characters, no. of words, no. of lines in a given file.

REFERENCE BOOKS:

1. Pradip Dey, Ghosh Manas (2009), *Programming in C,* Oxford University Press, USA.
2. E. Balaguruswamy (2009), *C and Data Structures,* 5th Edition, TMH publications, India.
3. M.K. Jain, S.R.K. Iyengar & R.K. Jain (2007), *Numerical Methods for Scientific and Engineering Computation,* 5th edition, New Age International Publishers, New Delhi.
4. Aitkinson, Han (2006), *Elementary Numerical Analysis*, 3rd Edition, John Wiley & Sons (Asia) Private Ltd., India.

B. Tech. CSE I SEMESTER

PC SOFTWARE LAB
(Common to CSE, IT & EEE)

Course Code: **A1601**

L	T	P	C
-	2	3	2

LIST OF EXPERIMENTS:

1. PC Hardware:

Task 1 and 2 - Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor based on your observation:

1. Check and measure various supply voltages of PC.
2. Make comparative study of motherboards.
3. Observe and study various cables, connections and parts used in computer communication.
4. Study various cards used in a system viz. display card, LAN card etc.
5. Study on floppy disk drive.
6. Study on hard disk.
7. To remove, study and replace CD ROM drive.
8. To study monitor, its circuitry and various presents and some elementary fault detection.
9. To study printer assembly and elementary fault detection of DMP and laser printers.
10. To observe various cables and connectors used in networking.
11. To study parts of keyboard and mouse.
12. To assemble a PC.
13. Troubleshooting exercises related to various components of computer like monitor, drives, memory and printers etc.
14. Study on operating systems: Microsoft Windows, Linux and Macintosh

Task 3 - Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards

2. Net Working:

Task 4 and 5 - Importance of Networking:

1. Communication and Transmission Devices such as Modems, hubs, switches, routers , gateways, twisted pair cables, optic fiber, radio wave communication
2. Associated software Communication modes

Features of Networking, Communication Protocols
Topology: Ring, Star, Bus, etc
Types of Networks: Local Area, Metropolitan Area, Wide Area Networking
Wireless Network: Wide Area Networking, Value added Networking

Network Administration:

1. Holding & protecting Supervisor password
2. Protecting access to sensitive files
3. Allocation of user login, password and access rights
4. Control on unauthorised user activities
5. Day to day management of user requirements
6. Vigilance over unauthorised programs, failed attempts to access
7. Steps to prevent hacking & wiretapping
8. Password control
9. Maintenance of Audit trail logs
10. Physical control on access to servers & console

3. Internet & World Wide Web:

Task 6 - Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Task 7 - Web Browsers, 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.

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

Task 9 - 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 an 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.

4. MICROSOFT OFFICE/ Equivalent (FOSS) tools

MS/equivalent (FOSS) tool Word

Task 10 and 11 – Word Orientation: Word– Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word, 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 in both and Word, Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check , Track Changes , Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs, Forms, Text Fields, Inserting objects, Mail Merge in Word.

MS/equivalent (FOSS) tool Excel

Task 12 and 13 - Excel Orientation : Excel –Accessing, overview of toolbars, saving excel files, Using help and resources, Gridlines, Format Cells, Summation, auto fill, Formatting Text, Cell Referencing, Formulae in excel – average, standard deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP, Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting, Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation

MS/equivalent (FOSS) tool Power Point

Task 14 and 15 - PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows, Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts, Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides, Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing.

MS/equivalent (FOSS) tool Publisher

Task 16 - Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

REFERENCE BOOKS:

1. Vikas Gupta (2008), Comdex *Hardware and Networking Course Kit*, DreamTech press, New Delhi, India.
2. Sumitabha Das (2008), *UNIX concepts and applications*, 4th Edition, Tata McGraw Hill, New Delhi, India.

SYLLABI FOR II SEMESTER

B. Tech. CSE II SEMESTER

MATHEMATICS - II
(Common to all Branches)

Course Code: **A1007**

L	T	P	C
3	1	-	4

UNIT - I

SOLUTION FOR LINEAR SYSTEMS AND EIGEN VALUES & EIGEN VECTORS: *Matrices and linear systems of equations*: Elementary row transformations - rank - echelon form, normal form, solution of linear systems, direct methods**.** Eigen values, Eigen vectors - properties. Cayley-Hamilton theorem (without proof) - inverse and powers of a matrix by Cayley-Hamilton theorem, diagonlization of matrix, calculation of powers of a matrix, modal and spectral matrices.

UNIT - II

LINEAR TRANSFORMATIONS: Real matrices, symmetric, skew symmetric, orthogonal, linear transformation, orthogonal transformation. *Complex matrices*: Hermitian, Skew Hermitian and unitary, Eigen values and Eigen vectors of complex matrices and their properties. Quadratic forms- reduction of quadratic form to canonical form -rank - positive, negative definite - semi definite - index - signature.

UNIT - III

PARTIAL DIFFERENTIAL EQUATIONS: Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions - solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations. Method of separation of variables for second order equations -two dimensional wave equation.

UNIT - IV

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. Fourier integral theorem, Fourier sine and cosine integral.

UNIT - V

FOURIER TRANSFORMS AND Z - TRANSFORMS: Fourier transform, Fourier sine and cosine transforms, properties, inverse transforms, finite Fourier transforms. Z-transforms, inverse Z-transforms, properties, Damping rule, Shifting rule, initial and final value theorems, Convolution theorem, Solution of difference equations by Z-transforms.

TEXT BOOKS:

1. Grewal B. S (2007), *Higher Engineering Mathematics*, 40th edition, Khanna Publishers, New Delhi.
2. Iyengar T.K.V., Krishna Gandhi B. & Others (2011), *Mathematical Methods*, 10th revised edition, S. Chand & Company Limited, New Delhi.

REFERENCE BOOKS:

1. Shahanaz Bathul (2007), *Mathematical Methods*, 3rd edition, Right Publishers, Hyderabad.
2. Jain R. K., Iyengar S. R. K (2008), *Advanced Engineering Mathematics,* 3rd edition, Narosa Publication House, New Delhi.
3. Dass H. K ,Rajnish Verma Er (2007), *Higher Engineering Mathematics*, First Edition, S. Chand & Company Limited, New Delhi.

B. Tech. CSE II SEMESTER

ENGINEERING PHYSICS
(Common to CSE, IT & ECE)

Course Code: **A1002**

L	T	P	C
4	-	-	4

UNIT - I

BONDING IN SOLIDS: Ionic bond, Covalent bond, Metallic bond, Hydrogen bond, Vander-Waal's bond, calculation of cohesive energy.

CRYSTALLOGRAPHY AND CRYSTAL STRUCTURES: Space lattice, Unit cell lattice parameters, Crystal systems, Bravais lattices, Atomic radius, co-ordination number and packing factor of SC, BCC, FCC, diamond and HCP structures, structures of NaCl, ZnS, CsCl.

UNIT - II

CRYSTAL PLANES & X-RAY DIFFRACTION: Miller indices, Crystal planes and directions, Inter planar spacing of orthogonal crystal systems, Basic principles of X-ray diffraction, Bragg's law, Laue method, Powder method, applications of X- ray diffraction.

NANOTECHNOLOGY: Origin of Nanotechnology, Nano scale, surface to volume ratio, bottom-up fabrication: Sol-gel, precipitation, Combustion methods; Top-down fabrication: Chemical vapour deposition, physical vapour deposition, pulsed laser vapour deposition methods and applications.

UNIT - III

PRINCIPLES OF QUANTUM MECHANICS: Waves and particles, De Broglie hypothesis , matter waves, Davisson and Germer's experiment, g. P. Thomson experiment, Schrödinger's time independent wave equation, physical significance of the wave function - particle in one dimensional potential box.

BAND THEORY OF SOLIDS: Electron in a periodic potential, Bloch theorem, Kronig-penny model(qualitative treatment), origin of energy band formation in solids, classification of materials into conductors, semi conductors & insulators, concept of effective mass of an electron.

UNIT - IV

DIELECTRIC PROPERTIES: Electric dipole moment, dielectric constant, polarization, electric susceptibility internal fields in solids, Clausius - Mossotti equation and its derivation, Piezo-electricity and Ferro- electricity.

MAGNETIC PROPERTIES: Origin of magnetic moment, classification of magnetic materials on the basis of magnetic moment, domain theory of Ferro magnetism, hysteresis curve, soft and hard magnetic materials.

SUPERCONDUCTIVITY: Introduction to superconductivity, Meissner effect, BCS theory, applications of superconductors.

UNIT- V

LASERS: Characteristics of lasers, spontaneous and stimulated emission of radiation, meta-stable state, population inversion, lasing action, Einstein's coefficients, ruby laser, Helium-neon laser, semiconductor diode laser, applications of lasers.

FIBER OPTICS: Principle of optical fiber, acceptance angle, numerical aperture, types of optical fibers, attenuation of signal in optical fibers, application of optical fibers.

TEXT BOOKS:

1. S. O. Pillai, Sivakami (2009), *Engineering Physics,* 2nd edition, New Age International (P) Ltd, Delhi.

REFERENCE BOOKS:

1. C. Kittel (2009), *Introduction to Solid State Physics*, 8th edition, Wiley Eastern Publications, India.
2. A. J. Dekker (1999), *Solid State Physics*, Macmillan India Ltd, Chennai.
3. M. Ratner, D. Ratner (2003), *Nanotechnology*, Pearson Edition, India.
4. P. Sarah (2008), *Lasers & Optical Fiber communications*, IK International (P) Ltd, New Delhi.

B. Tech. CSE II SEMESTER

ENGINEERING CHEMISTRY
(Common to CSE, IT & ECE)

Course Code: **A1003**

L	T	P	C
4	-	-	4

UNIT - I

ELECTROCHEMISTRY AND BATTERIES: Concept of Electrochemistry, Conductance Electrolyte in solution, Conductance specific, Equivalent and molar conductance, Ionic Mobilities, Kolrausch's law & applications. *EMF:* Galvanic cells, Nernst equation, Galvanic series, Numerical problems.

BATTERIES: Primary and secondary cells, Lead-acid cell, NI-CD cell, Lithium cells. Applications of batteries, *Fuel cells:* Hydrogen – Oxygen fuel cells, advantages of fuel cells.

UNIT - II

WATER: Introduction, *Hardness:* causes, expression of hardness units, types of hardness, estimation of temporary and permanent hardness of water, numerical problems. Softening of water internal and external treatment, Zeolite, ion exchange process and numerical problems, reverse osmosis, electro dialysis.

UNIT - III

POLYMERS: Types of polymerization, *Plastics:* Thermoplastic resins & thermo set resins. Compounding & fabrication of plastics, preparation, properties, engineering applications of: polyethylene, PVC, PS, Teflon, Nylon. *Rubber:* vulcanization. *Elastomers:* Buna-s, Buna-n, Thiokol rubbers, fibers polyester, applications.

SURFACE CHEMISTRY: Solid surfaces, types of adsorption, Longmuir adsorption isotherm, application adsorption, classification of colloids, electrical & optical properties of colloids, applications of colloids in industry. *Nano materials*: Introduction, preparation and applications of nano materials.

UNIT - IV

ENERGY SOURCES: Fuels, classification, conventional fuels (solid, liquid, gaseous) solid fuels, coal analysis proximate and ultimate analysis and their significance liquid fuels, primary petroleum, refining of petroleum. *Gaseous Fuels:* natural gas, analysis of flue gas by Orsat's method combustion, problems.

UNIT - V

PHASE RULE: Definitions, phase, component, degree of freedom and phase rule equation. Phase diagrams, one component system: Water system. Two component system: Lead silver system.

MATERIAL CHEMISTRY: *Cement:* Composition of Portland cement, manufacture of Port land cement. *Lubricants:* Criteria of a good lubricant. *Refractories:* Classification, characteristics of good refractory. *Insulators & conductors:* Classification of insulators, characteristics of thermal & electrical insulators and applications of superconductors.

TEXT BOOKS:

1. Dara S. S., Mukkanti (2006), *Engineering Chemistry,* S. Chand & Company Limited, New Delhi.

REFERENCE BOOKS:

1. Jain. P. C. and Monica Jain (2008), *Engineering Chemistry,* Dhanpat Rai Publishing Company, New Delhi.
2. Mishra. K. N., Mani R.P. and Rama Devi. B (2009), *Chemistry of Engineering Materials,* Cengage learning.
3. Kuriacase J. C and Rajaram. J (2004), *Engineering Chemistry,* Tata Mc Graw Hill Co., New Delhi.

B. Tech. CSE II SEMESTER

DATA STRUCTURES THROUGH C
(Common to CSE, IT, ECE & EEE)

Course Code: **A1503**

L	T	P	C
4	-	-	4

UNIT - I

RECURSION AND LINEAR SEARCH: Preliminaries of algorithm, algorithm analysis and complexity. Recursion definition, design methodology and implementation of recursive algorithms, linear and binary recursion, recursive algorithms for factorial function, GCD computation, Fibonacci sequence, Towers of Hanoi, tail recursion. List searches using linear search, binary search, Fibonacci search, analyzing search algorithms.

UNIT - II

SORTING TECHNIQUES: Basic concepts, Sorting by: Insertion (insertion sort), Selection (heap sort), Exchange (bubble sort, quick sort), Distribution (radix sort) and Merging (merge sort) algorithms.

UNIT - III

STACKS: Basic stack operations, representation of a stack using arrays, *Stack Applications*: Reversing list, factorial calculation, in-fix- to postfix transformation, evaluating arithmetic expressions.

QUEUES: Basic queues operations, representation of a queue using array, implementation of Queue operations using Stack, applications of Queues-Round Robin Algorithm, Enqueue, Dequeue, Circular queues, Priority queues.

UNIT - IV

LINKED LISTS: Introduction, single linked list, representation of a linked list in memory, operations on a single linked list, merging two single linked lists into one list, reversing a single linked list, applications of single linked list to represent polynomial expressions and sparse matrix manipulation, advantages and disadvantages of single linked list, circular linked list, double linked list.

UNIT - V

TREES: Basic tree concepts, *Binary Trees:* Properties, representation of binary trees using arrays and linked lists, operations on a binary tree, binary tree traversals, creation of binary tree from in-order and pre (post) order traversals, tree travels using stack, threaded binary trees.

GRAPHS: Basic concepts, *Representations of Graphs:* Using Linked list and adjacency matrix, graph algorithms, graph traversals (BFS & DFS)

TEXT BOOKS:

1. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan (2008), *Fundamentals of Data Structure in C*, 2nd Edition, University Press, India.
2. Richard F. Gilberg, Behrouz A. Forouzan (2005), *Data Structures: A Pseudo code approach with C*, 2nd Edition, Thomson, India.

REFERENCE BOOKS:

1. Seymour, Lipschutz (2005), *Data Structures*, Schaum's Outlines Series, Tata McGraw-Hill, India.
2. Debasis, Samanta (2009), *Classic Data Structures*, 2nd Edition, Prentice Hall of India, India.
3. G. A. V. Pai (2008), *Data Structures and Algorithms: Concepts, Techniques and Applications*, Tata McGraw-Hill Education, India.
4. A. M. Tanenbaum, Y. Langsam, M. J. Augustein (1991), *Data Structures using C*, Prentice Hall of India, New Delhi, India.

B. Tech. CSE II SEMESTER

BASIC ELECTRICAL ENGINEERING
(Common to CSE & IT)

Course Code: **A1201**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO ELECTRICAL CIRCUITS: Concept of Circuit, R-L-C parameters, voltage and current sources, Independent and dependent sources, source transformation, voltage - current relationship for passive elements, Kirchhoff's laws, network reduction techniques, series, parallel and compound circuits.

UNIT - II

ANALYSIS OF ELCTRICAL CIRCUITS: mesh analysis: mesh equations by inspection method, super mesh analysis, nodal analysis: nodal equations by inspection method, supernode analysis, star-to-delta or delta-to-star transformation.

UNIT - III

SINGLE PHASE AC CIRCUITS: R.M.S, average values and form factor for different periodic wave forms, steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation, concept of reactance, impedance, susceptance and admittance phase and phase difference.

POWER AND POWER FACTOR: Concept of power factor, real and reactive powers, J notation, complex and polar forms of representation, complex power. Resonance for series and parallel circuits, concept of band width and Q factor.

UNIT - IV

MAGNETIC CIRCUITS: *Magnetic Circuits*: Faraday's laws of electromagnetic induction, concept of self and mutual inductance, dot convention, coefficient of coupling, composite magnetic circuit, analysis of series and parallel magnetic circuits.

UNIT - V

NETWORK TOPOLOGY: Definitions, Graph, Tree, basic Tieset and basic Cutset matrices for planar networks duality & dual networks.

NETWORK PARAMETERS: Two port network parameters, Z, Y, ABCD and hybrid parameters and their relations.

TEXT BOOKS:

1. William H. Hayt, Jack E. Kemmerly, Steven M. Durbin (2006), *Engineering Circuits Analysis*, 7th edition, Mc Graw Hill, New Delhi.
2. A. Chakrabarthy (2005), *Circuit Theory*, 4th edition, Dhanpat Rai & Sons Publications, New Delhi.

REFERENCE BOOKS:

1. Van Valkenburg, M. E. (1974), *Network Analysis*, 3rd edition, Prentice Hall of India, New Delhi.
2. Wadhwa C. L (2009), *Electric Circuits Analysis,* New Age International Publications, New Delhi.
3. A. Sudhakar, Shyammohan S. Palli (2003), *Electrical Circuits*, 2nd edition, Tata Mc Graw Hill, New Delhi.
4. Joseph Edminister (2001), *Electric Circuits*, 6th edition, Schaum's Outlines, Tata Mc Graw Hill, New Delhi.

B. Tech. CSE II SEMESTER

ENGINEERING PHYSICS AND ENGINEERING CHEMISTRY LAB
(Common to CSE, IT & ECE)

Course Code: **A1010**

L	T	P	C
-	-	3	2

ENGINEERING PHYSICS LAB

1. Study of I-V characteristics of an LED.
2. Determination of numerical aperture - optical Fibers.
3. Determination of time constant – R-C circuit.
4. Determination of energy gap of a given semiconductor material.
5. Determination of rigidity modulus of the material of a given wire– Torsional pendulum.
6. Determination of frequency of vibrating tuning fork – Melde's experiment.
7. Determination of wavelength and angular divergence of given laser source.
8. Determination of frequency of AC supply – Sonometer.
9. Determination of dispersive power of the material of the given prism – spectrometer.
10. Study of variation of magnetic field along a circular current carrying conductor – Stewart & Gee apparatus.

ENGINEERING CHEMISTRY LAB

1. **TITRIMETRY:** Estimation of hardness of water by EDTA method (or) Estimation of calcium in limestone by Permanganometry.
2. **MINERAL ANALYSIS:** Determination of percentage of copper in brass

INSTRUMENTAL METHODS:

3. **COLORIMETRY:** Determination of ferrous ion in cement by colorimetric method (Or) Estimation of copper by colorimetric method.
4. **CONDUCTOMETRY:** Conductometric titration of strong acid vs strong base (or) Conductometric titration of mixture of acids vs strong base.
5. **POTENTIOMETRY:** Titration of strong acid vs strong base by Potentiometry (or) Titration of weak acid vs strong base by Potentiometry.

PHYSICAL PROPERTIES:

6. Determination of viscosity of sample oil by redwood/ Ostwald's viscometer.
7. Determination surface tension of lubricants.
8. **IDENTIFICATION AND PREPARATIONS:** preparation of organic compounds: aspirin (or) Benzimidazole.

KINETICS:

9. To determine the rate constant of hydrolysis of methyl acetate Catalysed by an acid and also the energy of Activation (or) to study the kinetics of reaction between $K_2S_2O_8$ and KI.
10. **DEMONSTRATION EXPERIMENTS (ANY ONE OF THE FOLLOWING)**:
    a. Preparation of Thiokol rubber
    b. Adsorption on charcoal

B. Tech. CSE II SEMESTER

DATA STRUCTURES THROUGH C LAB
(Common to CSE, IT, ECE & EEE)

Course Code: **A1504**

L	T	P	C
-	-	3	2

LIST OF EXERCISES:

Exercise 1:
Write recursive programme which computes the n^{th} Fibonacci number, for appropriate values of n.

Exercise 2:
Write recursive programme for the following
a) Write recursive C programme for calculation of Factorial of an integer
b) Write recursive C programme for calculation of GCD (n, m)
c) Write recursive C programme for Towers of Hanoi : N disks are to be transferred from peg S to peg D with Peg I as the intermediate peg.

Exercise 3:
a) Write C programs that use both recursive and non recursive functions to perform linear search for a Key value in a given list.
b) Write C programs that use both recursive and non recursive functions to perform binary search for a Key value in a given list.
c) Write C programs that use both recursive and non recursive functions to perform Fibonacci search for a Key value in a given list.

Exercise 4:
a) Write C programs that implement Bubble sort, to sort a given list of integers in ascending order
b) Write C programs that implement Quick sort, to sort a given list of integers in ascending order
c) Write C programs that implement Insertion sort, to sort a given list of integers in ascending order

Exercise 5:
a) Write C programs that implement heap sort, to sort a given list of integers in ascending order
b) Write C programs that implement radix sort, to sort a given list of integers in ascending order
c) Write C programs that implement merge sort, to sort a given list of integers in ascending order

Exercise 6:
a) Write C programs that implement stack (its operations) using arrays
b) Write C programs that implement stack (its operations) using Linked list

Exercise 7:
a) Write a C program that uses Stack operations to Convert infix expression into postfix expression
a) Write C programs that implement Queue (its operations) using arrays.
b) Write C programs that implement Queue (its operations) using linked lists

Exercise 8:
a) Write a C program that uses functions to create a singly linked list
b) Write a C program that uses functions to perform insertion operation on a singly linked list
c) Write a C program that uses functions to perform deletion operation on a singly linked list

Exercise 9:
a) Adding two large integers which are represented in linked list fashion.
b) Write a C programme to reverse elements of a single linked list.
c) Write a C programme to store a polynomial expression in memory using linked list
d) Write a C programme to representation the given Sparse matrix using arrays.
e) Write a C programme to representation the given sparse matrix using linked list

Exercise10:
a) Write a C program to create a Binary Tree of integers
b) Write a recursive C program, for traversing a binary tree in preorder, inorder and postorder.
c) Write a non recursive C program, for traversing a binary tree in preorder, inorder and postorder.
d) Program to check balance property of a tree.

B. Tech. CSE II SEMESTER

COMPUTER AIDED ENGINEERING DRAWING LAB
(Common to CSE, IT & EEE)

Course Code: **A1305**

L	T	P	C
-	2	3	2

UNIT - I

INTRODUCTION: Introduction to computer aided drafting, auto CAD commands, theory of projection, elements of projection, planes of projection, methods of projection.

ORTHOGRAPHIC PROJECTION: Lines used in general engineering drawing, types of surfaces, invisible lines, precedence of lines, selection of views, principles of multi view drawing, steps to draw orthographic views, orthographic projection of different objects.

UNIT - II

PROJECTION OF POINTS AND STRAIGHT LINES: Projection of points, various positions of straight lines w.r.t. reference planes, skew line, traces of line, projection of straight lines and traces.

UNIT - III

PROJECTION OF PLANES: Types of planes, projection of planes, traces of planes.

UNIT - IV

PROJECTION OF SOLIDS: Divisions of solids, polyhedra, solids of revolution, projection of solids in simple position, projection of solids with axis inclined to one reference plane and parallel to other.

UNIT - V

ISOMETRIC PROJECTIONS: Divisions of pictorial projection, divisions of axenometric projection, theory of isometric projection, isometric drawing, non-isometric drawing, isometric drawing from orthographic views for simple objects.

TEXT BOOKS:

1. D. M. Kulkarni, A. P. Rastogi, and A. K. Sarkar (2009), *Engineering Graphics with AutoCAD*, PHI Learning Private Limited, New Delhi.
2. Arshad Noor Siddiquee, Zahid Akhtar Khan, Mukhtar Ahmad (2006), *Engineering Drawing with a Primer on Autocad,* 2nd Edition, Prentice Hall, India.
3. Jolhe, Dhananjay (2006), *Engineering Drawing: With an Introduction to CAD*, Tata Mc Graw Hill, India.

REFERENCE BOOKS:

1. N. D. Bhatt, V. M. Panchal (2005), *Engineering Drawing***,** 48th Edition, Charotar Publishing House, Gujarat.
2. K. R. Gopalakrishna (2005), *Engineering Graphics*, 32nd Edition, Subash Publishers, Bangalore.

SYLLABI FOR III SEMESTER

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to CSE, IT, EEE, AE & CE)

Course Code: **A1013**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope Managerial Economics, *Demand Analysis:* Demand Determinants, Law of Demand and its exceptions.

ELASTICITY OF DEMAND: Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)**.**

UNIT - II

THEORY OF PRODUCTION AND COST ANALYSIS: Production Function, Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale.

COST ANALYSIS: Cost concepts, Opportunity cost, fixed vs. variable costs, explicit costs vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break Even Analysis (BEA), termination of Break Even Point (simple problems), Managerial Significance and limitations of BEA.

UNIT - III

INTRODUCTION TO MARKETS AND PRICING STRATEGIES: *Market structures*: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition.

PRICE DETERMINATION AND PRICE STATISTICS: Price-Output Determination in case of Perfect Competition and Monopoly, Pricing Strategies.

UNIT - IV

BUSINESS AND NEW ECONOMIC ENVIRONMENT: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

CAPITAL AND CAPITAL BUDGETING: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance. Nature and scope of capital budgeting, features of capital budgeting proposals, *Methods of Capital Budgeting:* Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

UNIT - V

INTRODUCTION TO FINANCIAL ACCOUNTING: Double-Entry Book Keeping, Journal, Ledger, Trial Balance-Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

FINANCIAL ANALYSIS THROUGH RATIOS: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

1. Aryasri (2005), *Managerial Economics and Financial Analysis,* 2nd edition, Tata McGraw Hill, New Delhi, India.
2. Varshney, Maheswari (2003), *Managerial Economics,* Sultan Chand, New Delhi, India.

REFERENCE BOOKS:

1. Ambrish Gupta (2004), *Financial Accounting for Management,* Pearson Education, New Delhi, India.
2. Domnick Salvatore (2011), *Managerial Economics in a Global Economy,* 7th edition, Oxford University Press, United States of America.
3. Narayanaswamy (2005), *Financial Accounting, A Managerial Perspective,* Prentice Hall of India private Ltd, New Delhi, India.

B. Tech. CSE III SEMESTER

ELEMENTS OF ELECTRICAL ENGINEERING
(Common to CSE & IT)

Course Code: **A1205**

L	T	P	C
4	-	-	4

UNIT - I

NETWORK THEOREMS: Superposition, Reciprocity, Thevenin's, Norton's and Maximum Power Transfer theorems for DC excitations.

THREE PHASE CIRCUITS: Phase sequence, Star and delta connection, Relation between line and phase voltages and currents in balanced systems, Analysis of balanced three phase circuits.

UNIT - II

D.C GENERATORS: Principle of operation of DC Machines, EMF equation, Type of Generators, Magnetization and Load Characteristics of DC Generators.

D.C. MOTORS: Types of DC Motors, Characteristics of DC Motors. Losses and Efficiency, Swinburne's Test, Speed control of DC Shunt Motor, Flux and Armature Voltage control Methods.

UNIT - III

TRANSFORMERS: Principle of operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuit, Losses and Efficiency of Transformer and Regulation, OC and SC Tests, Predetermination of Efficiency and Regulation.

UNIT - IV

THREE PHASE INDUCTION MOTORS: Principle of operation of three, phase induction motors, Slip ring and Squirrel cage motors, Slip-Torque characteristics, Efficiency calculation, starting methods.

SINGLE PHASE INDUCTION MOTORS: Principle of operation, Shaded pole motors, Capacitor motors, Stepper Motors Characteristics.

UNIT - V

ALTERNATORS: Alternators working principle, EMF Equation of alternator, Predetermination of regulation by Synchronous Impedance Method.

SYNCHRONOUS MOTOR: Principle of operation, Methods of starting of synchronous motor.

TEXT BOOKS:

1. A. Sudhakar, Shyammohan S Palli (2008), *Network Analysis,* Tata Mc Graw-Hill Publications, New Delhi.
2. B. L. Theraja, A. K. Theraja (2011), *A Text book of Electrical Technology (Volume-II),* 4th edition, S. Chand Publications, New Delhi.

REFERENCE BOOKS:

1. Joseph A Edminister (2002), *Schaum's outline of Electrical Circuits,* 4th Edition, McGraw Hill Publishers, New Delhi, India.
2. J. B. Gupta (2006), *Theory and Performance of Electrical Machines*, S. K. Kataria & Sons, New Delhi.

B. Tech. CSE III SEMESTER

DIGITAL LOGIC DESIGN
(Common to CSE, IT, ECE & EEE)

Course Code: **A1404**

L	T	P	C
3	1	-	4

UNIT - I

DIGITAL SYSTEMS AND BINARY NUMBERS: Digital systems, binary numbers, number base conversions, octal and hexadecimal numbers, complements, signed binary numbers, binary codes, binary storage and registers, binary logic.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic definitions, axiomatic definition of Boolean algebra, basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, digital logic gates.

UNIT - II

GATE LEVEL MINIMIZATION: The k-map method, four-variable map, five-variable map, product of sums simplification, don't-care conditions, NAND and NOR implementation, AND-OR-INVERT, OR-AND-INVERT implementations, exclusive - OR function, Variable entered mapping, the tabulation (Quine - Mccluskey) technique, determination and selection of Prime Implicants.

COMBINATIONAL LOGIC: Combinational circuits, analysis procedure, design procedure, binary adder, binary subtractor, decimal adder, binary multiplier, magnitude comparator, decoders, encoders, multiplexers.

UNIT - III

SYNCHRONOUS SEQUENTIAL LOGIC: Sequential circuits, latches, flip-flops, analysis of clocked sequential circuits, State reduction and assignment, design procedure.

REGISTERS AND COUNTERS: Registers, shift registers, ripple counters, synchronous counters, counters with unused states, ring counter, Johnson counter.

UNIT - IV

MEMORY AND PROGRAMMABLE LOGIC: Introduction**,** Random access memory, memory decoding, error detection and correction, read only memory, programmable logic array, programmable array logic, sequential programmable devices.

UNIT - V

ALGORTHMIC STATE MACHINES (ASM): Introduction, ASM chart, timing considerations, design with multiplexers.

ASYNCHRONOUS SEQUENTIAL LOGIC: Introduction, analysis procedure, circuits with latches, design procedure, reduction of state and flow tables, race-free state assignment hazards, design example.

TEXT BOOKS:

1. M. Morris Mano, Michael D. Ciletti (2008), *Digital Design*, 4th edition, Pearson Education Inc, India.

REFERENCE BOOKS:

1. Zvi. Kohavi (2004), *Switching and Finite Automata Theory*, Tata McGraw Hill, India.
2. C. V. S. Rao (2009), *Switching and Logic Design*, 3rd Edition, Pearson Education, India.
3. Donald D. Givone (2002), *Digital Principles and Design*, Tata McGraw Hill, India
4. Roth (2004), *Fundamentals of Logic Design*, 5th Edition, Thomson, India.

B. Tech. CSE III SEMESTER

ELECTRONIC DEVICES AND CIRCUITS
(Common to CSE & IT)

Course Code: **A1405**

L	T	P	C
3	1	-	4

UNIT - I

PN JUNCTION DIODE: Operation of PN junction - forward bias and reverse bias, diode current equation (qualitative treatment), volt-ampere (V-I) characteristics, temperature dependence of V-I characteristics, ideal versus practical diode, static and dynamic resistances, diode equivalent circuits, break down mechanisms in semiconductor diodes, zener and tunnel diode characteristics.

RECTIFIERS AND FILTERS: PN junction as a rectifier, half wave rectifier, full wave rectifier, Bridge Rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, Zener diode as a voltage regulator.

UNIT - II

BIPOLAR JUNCTION TRANSISTOR (BJT): BJT construction, operation, symbol, transistor current components, input & output characteristics of a transistor in CB, CE and CC configurations, BJT specifications.

TRANSISTOR BIASING AND STABILIZATION: Need for biasing, operating point, DC and AC load lines, fixed bias, collector to base bias, voltage divider bias, bias compensation, bias stabilization.

UNIT - III

BJT AMPLIFIERS: BJT h-parameter model, analysis of transistor amplifier using h-parameter model, CB, CE and CC amplifiers, comparison of CB, CE and CC configurations, simplified h-parameter model.

UNIT - IV

FIELD EFFECT TRANSISTOR: Junction field effect transistor (construction, principle of operation, symbol) - pinch-off voltage - volt-ampere characteristics, MOSFET (construction, principle of operation, symbol), characteristics in enhancement and depletion modes, small signal model of JFET & MOSFET.

UNIT - V

FEEDBACK AMPLIFIERS AND OSCILLATORS: Feedback concepts, types of feedback circuits (block diagram representation), general characteristics of negative feedback amplifier, effect of feedback on amplifier characteristics. Barkhausen criterion, Hartley & Colpitts oscillators, Phase shift oscillators and Crystal oscillator.

TEXT BOOKS:

1. J. Millman, Christos C. Halkias (2008), *Electronic Devices and Circuits,* Tata McGraw Hill, New Delhi.
2. R.L. Boylestad and Louis Nashelsky (2006), *Electronic Devices and Circuits*, 9th edition, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. Rober T. Paynter (2003), *Introduction to Electronic Devices and Circuits*, 6th edition, Pearson Education, New Delhi, India.
2. S. Salivahana, N. Suresh Kumar, A. Vallavaraj (2008), *Electronic Devices and Circuits*, 2nd edition, Tata McGraw Hill, New Delhi.

B. Tech. CSE III SEMESTER

DISCRETE MATHEMATICAL STRUCTURES
(Common to CSE & IT)

Course Code: **A1505**

L	T	P	C
3	1	-	4

UNIT - I

MATHEMATICAL LOGIC: Statements and Notations, Connectives, Statement Formulas and Truth Tables, Well- formed formulas, Tautologies, Equivalence of Formulas, *Normal Forms*: Disjunctive Normal Forms (DNF), Conjunctive Normal Forms (CNF), Principle Disjunctive Normal Forms (PDNF), Principle Conjunctive Normal Forms (PCNF) .

PREDICATES: The Predicate calculus, Free and Bound Variables, Rules of Inference, Consistency of Premises and Indirect Method of Proof, Automatic Theorem Proving.

UNIT - II

RELATIONS AND ORDERING: Relations, Properties of Binary Relations in a Set, Equivalence Relations, Compatibility Relations, Partial Ordering, Partial Ordered Set – Representation and Associated Terminology.

FUNCTIONS: Definition and Introduction, Composition of Functions, Inverse Functions, Recursive Functions.

UNIT - III

ALGEBRAIC STRUCTURES: Algebraic Systems: Examples and General Properties. Semigroups and Monoids. Groups: Definitions and Examples, Subgroups and Homomorphisms.

LATTICES: Lattices as Partially Ordered Sets - Definition and Examples, Properties of Lattices, Lattices as Algebraic Systems, Sublattices, Direct Product and Homomorphism, Some Special Lattices.

UNIT - IV

ELEMENTARY COMBINATORICS: Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutations with Constrained Repetitions, Binomial Coefficients, The Binomial and Multinomial Theorems, The Principle of Inclusion-Exclusion.

UNIT - V

RECURRENCE RELATIONS: Generating Functions of Sequences, Calculating Coefficients of Generating Functions, Recurrence Relations, Solving Recurrence Relations by Substitution and Generating Functions, The Method of Characteristic Roots, Solutions of Inhomogeneous Recurrence Relations.

TEXT BOOKS:

1. J. P. Trembly, R. Manohar (1997), *Discrete Mathematical Structures with Applications to Computer Science*, Tata McGraw Hill, India.
2. Joe L. Mott, Abraham Kandel, Theodore P. Baker (2011), *Discrete Mathematics for Computer Scientists and Mathematicians*, 2nd edition, Prentice Hall of India Learning Private Limited, New Delhi, India.

REFERENCE BOOKS:

1. Kenneth H. Rosen (2007), *Discrete Mathematics and its Applications*, 6th edition, Tata McGraw Hill, India.
2. C.L. Liu, D.P. Mohapatra (2008), *Elements of Discrete Mathematics*, 3rd edition, McGraw Hill, India.
3. Ralph P. Grimaldi, B.V.Ramana (2006), *Discrete and Combinatorial Mathematics - An Applied Introduction*, 5th Edition, Pearson Education, India.
4. D.S Malik, M. K Sen (2004), *Discrete Mathematical Structures: Theory and Applications*, Thomson Course Technology, India.

B. Tech. CSE III SEMESTER

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common to CSE & IT)

Course Code: **A1506**

L	T	P	C
4	-	-	4

UNIT - I

OBJECT ORIENTED THINKING: Need for object oriented programming paradigm, a way of viewing world agents and Communities, messages, methods, responsibilities, Classes and Instances, Class Hierarchies-Inheritance ,Method Binding, Overriding and Exceptions.

JAVA BASICS: History of Java, Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, methods, string and String Buffer handling functions.

UNIT - II

INHERITANCE AND POLYMORPHISM: Basic concepts, types of inheritance, member access rules, usage of this and super key word, method overloading, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, static import.

PACKAGES AND INTERFACES: Defining package, access protection, importing packages, defining and implementing interface, and variables in interface and extending interfaces.

I / O STREAMS: Concepts of streams, stream classes- byte and character stream, reading console input and writing console output, File: introduction to file, reading and writing to a file.

UNIT - III

EXCEPTION HANDLING: Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes.

MULTI THREADING: Concepts of thread, thread life cycle, creating threads using thread class and runnable interface, synchronization, thread priorities, inter thread communication.

UNIT - IV

AWT CONTROLS: The AWT class hierarchy, user interface components- labels, button, text components, check box, check box groups, choices, list box, panels - scroll pane, menu, scrollbars. Working with frame windows, color, font and layout managers.

EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes, inner classes.

UNIT - V

SWINGS: Introduction to swings, hierarchy of swing components. Containers, top level containers - JFrame, JWindow, JDialog, light weight containers - JPanel, swing components - JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPane.

APPLETS: Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets.

TEXT BOOKS:

1. Herbert schildt (2010), *The complete reference*, 7th edition, Tata Mc graw Hill, New Delhi

REFERENCE BOOKS:

1. T. Budd (2009), *An Introduction to Object Oriented Programming*, 3rd edition, Pearson Education, India.
2. J. Nino, F. A. Hosch (2002), *An Introduction to programming and OO design using Java*, John Wiley & sons, New Jersey.
3. Y. Daniel Liang (2010), *In*troduction *to Java programming*, 7th edition, Pearson education, India.
4. R. A. Johnson (2009), *An introduction to Java programming and object oriented application development*, 1st edition, Course Technology, India.

B. Tech. CSE III SEMESTER

ANALOG AND DIGITAL ELECTRONICS LAB
(Common to CSE & IT)

Course Code: **A1407**

L	T	P	C
-	-	3	2

PART - A

ANALOG DEVICES AND CIRCUITS

1. Characteristics of PN Junction diode
2. Characteristics of Zener diode
3. Ripple Factor and Load Regulations of Half-wave Rectifier with and without filters
4. Ripple Factor and Load Regulations of Full-wave Rectifier with and without filters
5. Input and Output characteristics of Transistor in Common Emitter configuration
6. Drain and Transfer Characteristics of Junction Field Effect Transistor (JFET)
7. Gain and Frequency response of Common Emitter Amplifier
8. Gain and Frequency response of Feedback Amplifier (Voltage series or current series)
9. Heartley and Colpitts Oscillator
10. RC phase shift Oscillator

PART - B

DIGITAL CIRCUITS

1. Realization of Logic gates using discrete components
2. Binary Adders and Subtractors
3. Comparators
4. Multiplexers
5. Decoders
6. Flip-Flops
7. Counters
8. Shift Registers

B. Tech. CSE III SEMESTER

JAVA PROGRAMMING LAB
(Common to CSE & IT)

Course Code: **A1507**

L	T	P	C
-	-	3	2

Week 1:

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 discriminate b^2-4ac is negative, display a message stating that there are no real solutions.

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

Week 2:

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 (Use String Tokenizer class of java.util)

Week 3:

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

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

c) Write a Java program to make frequency count of words in a given text.

Week 4:

a) Write a Java program that:
i) Implements stack ADT.
ii) Converts infix expression into Postfix form
iii) Evaluates the postfix expression

Week 5:

a) Write a java program to create an abstract class named Shape that contains an empty method named numberOfSides ( ).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 numberOfSides ( ) 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 JTable component.

Week 6:

a) Write a program that creates a user interface to perform integer divisions. The user enters two numbers in the textfields, Num1 and Num2. The division of Num1 and Num2 is displayed in the Result field when the Divide button is clicked. If Num1 or Num2 were not an integer, the program would throw a Number Format Exception. If Num2 were Zero, the program would throw an Arithmetic Exception Display the exception in a message dialog box.

Week 7:

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

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

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

Week 8:

a) Write a Java program that creates three threads. First thread displays “Good Morning” every one second, the second thread displays “Hello” every two seconds and the third thread displays “Welcome” every three seconds.

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

Week 9:

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

Week 10:

- Write a Java program for handling mouse events.
- Write a Java program for handling key events.

Week 11:

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 starts.

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

Week 12:

a) Develop an applet that displays a simple message in center of the screen.

b) Develop an applet that receives an integer in one text field, and computes its factorial Value and returns it in another text field, when the button named “Compute” is clicked.

SYLLABI FOR IV SEMESTER

B. Tech. CSE IV SEMESTER

OPERATING SYSTEMS
(Common to CSE & IT)

Course Code: **A1508**

L	T	P	C
4	-	-	4

UNIT - I

OPERATING SYSTEMS OVERVIEW: Introduction, operating system operations, process management, memory management, storage management, protection and security, distributed systems, special purpose systems.

OPERATING SYSTEMS STRUCTURES: Operating system services and systems calls, system programs, operating system structure, operating systems generations.

PROCESS MANAGEMENT: Process concepts, process state, process control block, scheduling queues, process scheduling, multithreaded programming, threads in UNIX, comparison of UNIX and windows.

UNIT - II

CONCURRENCY AND SYNCHRONIZATION: Process synchronization, critical section problem, Peterson's solution, synchronization hardware, semaphores, classic problems of synchronization, readers and writers problem, dining philosophers problem, monitors, synchronization examples(Solaris), atomic transactions. Comparison of UNIX and windows.

DEADLOCKS: System model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock banker's algorithm.

UNIT - III

MEMORY MANAGEMENT: Swapping, contiguous memory allocation, paging, structure of the page table, segmentation, virtual memory, demand paging, page-replacement algorithms, allocation of frames, thrashing, case study - UNIX.

FILE SYSTEM: Concept of a file, access methods, directory structure, file system mounting, file sharing, protection. File system implementation: file system structure, file system implementation, directory implementation, allocation methods, free-space management, efficiency and performance, comparison of UNIX and windows.

UNIT - IV

I/O SYSTEM: Mass storage structure - overview of mass storage structure, disk structure, disk attachment, disk scheduling algorithms, swap space management, stable storage implementation, tertiary storage structure.

I/O: Hardware, application I/O interface, kernel I/O subsystem, transforming I/O requests to hardware operations, streams, performance.

UNIT - V

PROTECTION: Goals of protection, principles of protection, domain of protection access matrix, implementation of access matrix, access control, revocation of access rights.

SECURITY: The security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, fire walling to protect systems.

TEXT BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne (2006), *Operating System Principles*, 7th edition, Wiley India Private Limited, New Delhi.

REFERENCE BOOKS:

1. Stallings (2006), *Operating Systems*, Internals and Design Principles, 5th edition, Pearson Education, India.
2. Andrew S. Tanenbaum (2007), *Modern Operating Systems*, 2nd edition, Prentice Hall of India, India.
3. Deitel & Deitel (2008), *Operating systems*, 3rd edition, Pearson Education, India.
4. Dhamdhere (2008), *Operating Systems*, Second Edition, Tata Mc graw Hill, New Delhi.

B. Tech. CSE IV SEMESTER

COMPUTER ARCHITECTURE AND ORGANIZATION
(Common to CSE, IT, ECE & EEE)

Course Code: **A1509**

L	T	P	C
3	1	-	4

UNIT - I

STRUCTURE OF COMPUTERS: Computer types, functional units, basic operational concepts, Von-Neumann architecture, bus structures, software, performance, multiprocessors and multicomputer, data representation, fixed and floating point and error detecting codes.

REGISTER TRANSFER AND MICRO-OPERATIONS: Register transfer language, register transfer, bus and memory transfers, arithmetic micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit.

UNIT - II

BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, computer registers, computer instructions, instruction cycle, timing and control, memory-reference instructions, input-output and interrupt. Central processing unit: stack organization, instruction formats, addressing modes, data transfer and manipulation, program control, reduced instruction set computer (RISC).

UNIT - III

MICRO-PROGRAMMED CONTROL: Control memory, address sequencing, micro-program example, design of control unit.

COMPUTER ARITHMETIC: Addition and subtraction, multiplication and division algorithms, floating-point arithmetic operation, decimal arithmetic unit, decimal arithmetic operations.

UNIT - IV

THE MEMORY SYSTEM: Basic concepts, semiconductor RAM types of read - only memory (ROM), cache memory, performance considerations, virtual memory, secondary storage, raid, direct memory access (DMA).

UNIT - V

MULTIPROCESSORS: Characteristics of multiprocessors, interconnection structures, interprocessor arbitration, interprocessor communication and synchronization, cache coherence, shared memory multiprocessors.

TEXT BOOKS:

1. M. Moris Mano (2006), *Computer System Architecture*, 3rd edition, Pearson/PHI, India.
2. Carl Hamacher, Zvonks Vranesic, SafeaZaky (2002), *Computer Organization*, 5th edition, McGraw Hill, New Delhi, India.

REFERENCE BOOKS:

1. William Stallings (2010), *Computer Organization and Architecture- designing for performance*, 8th edition, Prentice Hall, New Jersy.
2. Andrew S. Tanenbaum (2006), *Structured Computer Organization*, 5th edition, Pearson Education Inc, New Jersy.
3. Sivarama P. Dandamudi (2003), *Fundamentals of Computer Organization and Design*, Springer Int. Edition, USA.
4. John P. Hayes (1998), *Computer Architecture and Organization*, 3rd edition, Tata McGraw Hill, New Delhi, India.

B. Tech. CSE IV SEMESTER

THEORY OF COMPUTATION

Course Code: **A1510**

L	T	P	C
4	-	-	4

UNIT - I

FINITE AUTOMATA (FA): Introduction, model and behavior, Deterministic Finite Automata (DFA) -Formal definition, simpler notations (state transition diagram, transition table), language of a DFA. Nondeterministic Finite Automata (NFA)- definition of NFA, language of an NFA, Equivalence of Deterministic and Nondeterministic Finite Automata, Applications of Finite Automata, Finite Automata with Epsilon Transitions, Eliminating epsilon transitions, Minimization of Deterministic Finite Automata, finite automata with output (Moore and Mealy machines).

UNIT - II

REGULAR EXPRESSIONS (RE): Introduction, algebraic laws for Regular Expressions, Finite Automata and Regular Expressions- from DFA's to Regular Expressions, converting Regular Expressions to Automata, applications of Regular Expressions.

REGULAR GRAMMARS: Definition, regular grammars and FA, FA for regular grammar, regular grammar for FA. Proving languages to be non-regular -Pumping lemma, applications. Closure properties of regular languages.

UNIT - III

CONTEXT FREE GRAMMARS (CFG): Formal definition, sentential forms, leftmost and rightmost derivations, the language of a CFG. Derivation tree or parse tree, relationship between parse trees and derivations. Applications of Context Free Grammars, Ambiguous Grammar.

SIMPLIFICATION OF CFG: Removing useless symbols, Null (epsilon) - productions and unit productions. Normal forms: Chomsky Normal Form and Grieback Normal Form. Proving that some languages are not context free, Pumping lemma for Context Free Languages (CFL), applications. Some closure properties of CFLs, decision properties of CFLs, undecidable CFL problems.

UNIT - IV

PUSHDOWN AUTOMATA (PDA): Definition of the Pushdown Automata, the languages of PDA (acceptance by final state and empty stack), Equivalence of PDA's and CFG's, from Grammars to Pushdown Automata, Pushdown Automata to Grammars. Deterministic PDA(DPDA) -definition, DPDAs and regular languages, DPDAs and CFLs. Languages of DPDAs

UNIT - V

TURING MACHINES (TM): Formal definition and behavior, languages of a TM, TM as accepters, TM as a computer of integer functions, Types of TMs.

RECURSIVE AND RECURSIVELY ENUMERABLE LANGUAGES (REL): Some properties of recursive and recursively enumerable languages, universal Turing machine, the Halting problem, undecidable problems about TMs.

COMPUTABILITY THEORY: Context sensitive language and linear bounded automata (LBA), Chomsky hierarchy, the classes P and NP, post's correspondence problem (PCP), undecidability of PCP.

TEXT BOOKS:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman (2007), *Introduction to Automata Theory Languages and Computation*, 3rd edition, Pearson Education, India.

REFERENCE BOOKS:

1. K. L. P Mishra, N. Chandrashekaran (2003), *Theory of Computer Science-Automata Languages and Computation*, 2nd edition, Prentice Hall of India, India.
2. John C. Martin (2003), *Introduction to Languages and the Theory of Computation*, 3rd edition, Tata McGraw Hill, New Delhi.
3. Daniel I. A. Cohen (2007), *Introduction to Computer Theory*, 2nd edition, John Wiley, New Delhi, India.

B. Tech. CSE IV SEMESTER

WEB TECHNOLOGIES
(Common to CSE & IT)

Course Code: **A1603**

L	T	P	C
3	1	-	4

This course is designed in collaboration with Infosys Technologies Limited.

UNIT - I

INTRODUCTION TO WEB TECHNOLOGY: Web pages-types and issues, tiers, the concept of a tier, web pages, static web pages, plug-ins, introduction to HTML, common tags, the need for dynamic web pages. **Java Script**: Introduction to scripting, Control Structures-I, Control Structures-II, Functions, Arrays, Objects. **DHTML:** Cascading style sheets, Object model and collections, Event Model, Filters and Transitions.

UNIT - II

EXTENSIBLE MARKUP LANGUAGE: Standard generalized markup language (SGML), basics of XML, XML parsers, the need for the standard. **Web Servers**: PWS, IIS, Tomcat, Apache, Jigsaw Web Servers.

UNIT - III

JAVA BASED WEB TECHNOLOGIES - **JAVA SERVLETS**: Introduction to Java Servlets, Servlet Life Cycle, Http Servlet Class, Http Servlet Request & Response interfaces, Deploying a web application, Session Tracking, Cookies, Using JDBC from a Servlet.

UNIT - IV

JAVA BASED WEB TECHNOLOGIES - JAVA SERVER PAGES(JSP): Introduction to JSP, JSP elements, **JSP Directives**: Page Directive, Include Directive, Introduction to Java Beans, Action Elements: Use Bean Element, Custom Tag Libraries, Accessing database from a JSP Page.

UNIT - V

ASP: Common gateway interface (CGI), Microsoft ASP, Basics of ASP technology, ASP example, ASP trends. **Content Management Systems:** Introduction to content Management Systems, need and benefits of CMS, Case study using CMS Tools: Silver light, Joomla. Introduction to web development tools: Java server faces technology, Ruby concepts, Ajax.

TEXT BOOKS:

1. Dietel and Nieto(2008), *Internet and World wide Web How to Program,* 4th edition, PHI/Pearson Education Asia, New Jersey.

REFERENCE BOOKS:

1. H. Schild(2002), *The Complete Reference JAVA 2*, 5th edition, Tata McGraw Hill, New Delhi, India.
2. B. Boiko(2005), *Content Management Bible,* USA.
3. S. M. Grath(1998), *XML by Example*, 5th edition, Prentice Hall of India / Pearson Education, India.
4. C. Bates(2002), *Web Programming building Internet Applications*, 2nd edition, WILLEY Dream Tech, New Delhi, India.

WEB RESOURCES:

1. *XML in 10 point*. http://www.w3.org/XML/1999/XML-in-10-points.
2. *Cascading Style Sheets from W3*. http://www.w3.org/Style/CSS/
3. J*ava Programming* http://www.apl.jhu.edu/~hall/java/

B. Tech. CSE IV SEMESTER

COMPUTER GRAPHICS
(Common to CSE & IT)

Course Code: **A1604**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION: Application areas of computer graphics, overview of graphics systems, video-display devices and raster-scan systems, random scan systems, graphics monitors, work stations and input devices, graphics standards.

UNIT - II

OUTPUT PRIMITIVES: Points and lines, line drawing algorithms, midpoint circle and ellipse algorithms. Filled area primitives - scan line polygon fill algorithm, boundary fill and flood fill algorithms.

UNIT - III

2D - GEOMETRICAL TRANSFORMS: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms transformations between coordinate systems.

2D - 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

3D - GEOMETRIC TRANSFORMATIONS: Translation, rotation, scaling, reflection and shear transformations, composite transformations.

3D - VIEWING: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.

3D - OBJECT REPRESENTATION: Polygon surfaces, quadric surfaces, spline representation, Hermite curve, Bezier curve and B-spline curves, Bezier and B-spline surfaces.

UNIT - V

VISIBLE SURFACE DETECTION METHODS: classifications, back face detection, depth buffer, scan line and depth sorting.

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

TEXT BOOKS:

1. Donald Hearn, M. Pauline Baker (2011), *Computer Graphics with Open GL,* 3rd edition, Pearson Education, India.

REFERENCE BOOKS:

1. David F. Rogers (1998), *Procedural elements for Computer Graphics*, 2nd edition, Tata Mc Graw Hill, New Delhi, India.
2. Steven Harrington (1987), *Computer Graphics*, 2nd edition, Tata Mc Graw Hill, New Delhi, India.
3. Zhigand xiang, Roy Plastock (2000), *Computer Graphics,* 2nd edition, Schaum's outlines, Tata Mc Graw Hill Edition, USA.

B. Tech. CSE IV SEMESTER

DATABASE MANAGEMENT SYSTEMS
(Common to CSE & IT)

Course Code: **A1511**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: History of database systems, introduction to database management systems, database system applications, database systems versus file systems, view of data, data models, database languages- DDL & DML commands and examples of basic SQL queries, database users and administrators, transaction management, database system structure, application architectures.

DATABASE DESIGN: Introduction to database design and E-R diagrams, entities, attributes and entity sets, relationships and relationship sets, additional features of the E-R model, conceptual design with the E-R model, conceptual design for large enterprises.

UNIT - II

THE RELATIONAL MODEL: Introduction to the relational model, integrity constraints over relations, enforcing integrity constraints, querying relational data, logical database design: E-R to relational, introduction to views, destroying/altering tables and views.

RELATIONAL ALGEBRA AND CALCULUS: Preliminaries, relational algebra operators, relational calculus - tuple and domain relational calculus, expressive power of algebra and calculus.

SQL: Overview, the form of a basic SQL query, union, intersect and except operators, nested queries, aggregate operators, null values, complex integrity constraints in SQL, triggers and active databases, designing active databases.

UNIT - III

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, functional dependencies, reasoning about FDs. Normal forms: 1NF, 2NF, 3NF, BCNF, properties of decompositions, normalization, schema refinement in database design, other kinds of dependencies: 4NF, 5NF, DKNF, case studies.

UNIT - IV

TRANSACTIONS MANAGEMENT: Transaction concept, transaction state, implementation of atomicity and durability, concurrent executions, serializability, recoverability, implementation of isolation, transaction definition in SQL, testing for serializability.

CONCURRENCY CONTROL AND RECOVERY SYSTEM: Concurrency control - lock based protocols, time-stamp based protocols, validation based protocols, multiple granularity, and deadlock handling. Recovery system - failure classification, storage structure, recovery and atomicity, log-based recovery, shadow paging, recovery with concurrent transactions, buffer management, failure with loss of non-volatile storage, advanced recovery techniques, remote backup systems.

UNIT - V

OVERVIEW OF STORAGE AND INDEXING: Data on external storage, file organizations and indexing, index data structures, comparison of file organizations, indexes and performance tuning. Tree structured indexing - intuition for tree indexes, indexed sequential access method (ISAM), B+ Trees - a dynamic tree structure.

IBM DB2 FUNDAMENTALS*: DB2 product family - versions and editions, DB2 database and its objects, DB2 pure XML, backup and recovery, concurrency and its isolation levels, working with SQL, DB2 programming fundamentals - UDF, stored procedures.

** This topic is designed in collaboration with IBM India Private Limited.*

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke (2007), *Database Management Systems*, 3rd edition, Tata McGraw Hill, New Delhi, India.

REFERENCE BOOKS:

1. Elmasri Navate (1994), *Fundamentals of Database Systems*, Pearson Education, India.
2. Abraham Silberschatz, Henry F. Korth, S. Sudarshan (2005), *Database System Concepts,* 5th edition, McGraw-Hill, New Delhi, India.
3. Peter Rob, Carlos Coronel (2009), *Database Systems Design, Implementation and Management*, 7th edition, India.

B. Tech. CSE IV SEMESTER

COMPUTER GRAPHICS AND WEB TECHNOLOGIES LAB
(Common to CSE & IT)

Course Code: **A1605**

L	T	P	C
-	-	3	2

COMPUTER GRAPHICS LAB EXPERIMENTS:

1. a. Drawing lines using DDA, Bresenham's Algorithms.
   b. Drawing Circle using Bresenham's Algorithm.
   c. Drawing Ellipse using Bresenham's Algorithm.
2. a. Creating various types of text and fonts.
   b. Creating two dimensional objects using the lines and curves (Circle, Ellipse…..).
3. a. Animating the two dimensional pictures using transformations.
   b. Coloring the picture and Zooming.
4. a. Rotation, scaling and translating the 3D objects.
   b. Coloring the 2D & 3D objects.
5. a. Creating smooth surfaces and Curves.
   b. Creating an object and applying animation of key framing.

WEB TECHNOLOGIES LAB EXPERIMENTS:

This Laboratory is designed in collaboration with Infosys Technologies Limited.

1. Develop a static web page that demonstrates basic HTML tags.
2. Develop a web page to demonstrate different types of CSS.
3. Develop a web application using Java script to perform the following tasks:
   a. Registration validation
   b. User login
   c. User profile and credit card payment.
4. Design an XML document to structure the student data and validate using DTD.
5. Design an XML document to structure and display the data using an XSL.
6. a. Implement a simple Hello world program using Java Servlets.
   b. Implement User Management application using Java Servlets.
7. a. Implement a simple JSP page to perform simple functions.
   b. Implement User Management application using JSP.
8. Implement session Tracking and cookie Management in JSP.
9. Develop a simple application to create a custom tag using JSP.
10. Implement User Management application in ASP.

B. Tech. CSE IV SEMESTER

DATABASE MANAGEMENT SYSTEMS LAB
(Common to CSE & IT)

Course Code: **A1512**

L	T	P	C
-	-	3	2

*The Experiments can be executed in **Oracle** or **IBM DB2 Express C edition***

1. CASE STUDY : BANK DATABASE

A bank has many branches and a large number of customers. A customer can open different kinds of accounts with the bank. The bank keeps track of a customer by his SSN, name, address, and phone number. Age is used as a factor to check whether he is a major. There are different types of loans, each identified by a loan number. A customer can take out more than one type of loan, and all branches can give loans. Loans have a duration and interest rate. The account holder can enquire about the balance in his account, Draw an ER Diagram, data base design for the bank. Make suitable assumptions and use them in showing maximum and minimum cardinality ratio.

Answer to the following Queries:

1. List the details of customer of the bank?
2. Display details of loans?
3. List the details of the loans?
4. Give the names and cities of residence of all employee who work for First Bank Corporation?
5. Find the names, street, addresses and cities of residence of all employees who work for First Bank Corporation and earn more than 10000/-?
6. Delete all account tuples in the London?
7. List in alphabetic order all customers who have a loan at the “perryridge” branch?
8. Find all employees in the database who do not work for First Bank Corporation.
9. Give all loans numbers for a loan made at the Perryidge branch with loan amount greater than 1200
10. Display loan numbers of those loans with loan amount between 80000/- and 1,00,000/-?
11. Find loan numbers in loan relation whose mount is NIL?
12. Express SQL patterns by using like operators? Write a query to display the system date by rounding it to next year.
13. Write a query to display the last date of the system date.
14. Write a query to display the next date of system date which is Friday.
15. Write a query to display sale date and date after 02 months from sale date.
16. Write a query to display system date, sale date and months between two dates.
17. Write a query to display the greatest date between sale date and system date, name it as BIG, also display sale date and SYSDATE.
18. Write a query to display the least date between sale date and system date name it as SMALL, also display sale date and SYSDATE.
19. Write a query to display the product name along with the rounded value of product cost for product name is pencil ?
20. Write a query to display product cost along with MOD value if divided by 5.
21. Write a query to display ename in uppercase, lowercase, titlecase from employees table where employee name is “rohan”.
22. Write a query to display all concatenated value of **from, to** by converting **from** into titlecase and **to** into uppercase.
23. Write a query to display the first 3 characters of ename.
24. Write a query to display the position of ‘M’ in the ename of the employee whose name is “SAMHITA”.
25. Write a query to display the length of all employee names.

2. CASE STUDY : EMPLOYEE AND DEPARTMENT DATABASE:

The BlueX Company pvt. ltd has maintaining Employee information contains employee details .The company has four departments. Any employee working in the company belongs to any one of the department. An employee joined in company above 25 years only. The company may give commission for every employee if and only if more than 2 years experience. Construct the database design with that there is no redundancy .

Answer to the following Queries

1. List Employee Details
2. List the department Details?
3. Update emp table and change employee name ,ADAMS to ADAM
4. Update emp table and change sal, comm. To 2000 &500 to an employeeno 7844
5. Select deptno, dname ,of deptno>10 and located in 'NEWYORK'
6. List all employee details who belongs to deptno=10 and whose job is clerk
7. List all employee hired during 1981?
8. List all empno, ename of all employee in format "empno ename"
9. Find the total number of clerks in department 10
10. Find the average salary of employees?
11. List all employee of their average salaries
12. Find minimum salary paid employee and employee details with that salaries
13. Find the name of employee which starts with 'A' and end with 'N'?
14. List all employees who have a salary greater than 15000 in the order of department number?
15. List deptno , dname ,min(sal) for all departments?
16. List all employees dept-wise and job –wise?
17. Display all employee names, number, deptname & location of all employees?
18. Find the employees belongs to the research department?
19. Find employee name employee number, their salary who were hired after 01/02/97
20. Find the second maximum salary of employee table?
21. Find employee name from employee table whose manager is nil?

3. CASE STUDY: SAILORS, RESERVES, BOATS DATA BASE

In Database user has to maintain sailors information with sailors identity., and every sailor age is more than 25 years and has a rating i.e (rating >=10),the sailors re reserved the boats for shipment of goods. Each boat identified by Id, name, color Every sailors may reserve more than one boat. Reservation can noticed based on the date.

Answer to the following Queries

1. Find the sids ,names of sailors who have reserved boat 103
2. Find the ids , names of sailors who have reserved a red boat?
3. Find the color of boats reserved by Lubber.
4. Find the sids ,names of sailors who have reserved at least one boat?
5. Find the sids ,names of sailors who have reserved a red or a green boat?
6. Find the sids ,names of sailors who have reserved a red and a green boat?
7. Find the sids ,names of sailors who have reserved at least two boats?
8. Find the sids of sailors with age over 20 who have not reserved a red boat?
9. Find the sids ,names of sailors who have reserved all boats
10. Find the sids ,names of sailors who have reserved all boats called "INTERLAKE"
11. Find the ids, name and ages of sailors with rating above 11?
12. Find the sname , bid and reservation date for each reservation?
13. Find sids of all sailors who have reserved all boats
14. Find names and ages of all sailors
15. Find sids of all sailors who have reserved a red boats
16. Compute increments for the rating of sailors who have sailed two different boats on the same day?
17. Find the ages of sailors whose name begin and end with B and ha at least 3 characters?
18. Find sids of all sailors who have reserved a red boat but not a green boat?
19. Find the ids of sailors who have a rating of 10 o who have reserved boat 04?
20. Find the names of sailors who have not reserved a red boat
21. Find sailors whose rating is better than some sailor called "Horatio"
22. Find sailors whose rating is better than every sailor called "Horatio
23. Find the sailors with highest rating
24. Find average age of all sailors

25. Find average age of all sailors with a rating of 10?
26. Count number of sailors
27. Count number of different sailor with a rating of 10
28. Find the names of sailors who are older than the oldest sailor with a rating of 10
29. Find the age of youngest sailor for each rating level
30. Find the average age of sailors for each rating level that has at least two sailors

4. CASE STUDY: CAR RENTAL SYSTEM DATA BASE

The Carlux Ltee Rental Company. It is found in Cure pipe. This company rents many types of cars. When the company rents a car, the car is identified by its registration number, rents by a customer. Customer (Last name, First name, Birth date, Telephone num and Address) is identified by a Client Id, the transaction being processed by the employee. Employee (Last name, First name, Address, Position, Telephone num, Mobile num and Birth date) is identified by its Employee Id. Whenever a customer rents a car, date rented, amount, deposit and the number of days are kept. In returning the car the date returned, date rented and the person who processed the transaction are recorded.

Overview of the Functionalities: This System will facilitate the functioning of a "typical" rental car store. Each type of car should have a different rental fee per day. Rental fee depends on number of days, brand and how fast the car runs. The system should have the following functionalities:

Rent: the system equipped to answer customer's inquiries about the availability and rental fee of various "types" of cars for certain dates in the future. When the customer makes a decision about the "Type" of car and the dates, the system should be able to "Reserve" or "Earmark" the requested type of car for requested dates. the customer should be given a" confirmation number".

Pick Up: The system process a Car Pick Up. Customer walks in and supplies either the confirmation number or name. The system should pull up all the reservation information about this customer. The customer is then asked to supply a drivers' license.

Return: The system process a return. The system should record the date, time taken and provide information about clients and which employee attend which customer.

The purpose of this project is to facilitate their work with a new computerized database, which provides management with details concerning the employees, cars and clients as well as the transaction that took place for better co-ordination of job. The new computerized database will create a better system where information can be added, deleted, modified and updated easily.

Answer to the following Queries

1. List all the available car models?
2. Display all the rents of car?
3. Display the employee details
4. Display the cars which are booked
5. Display details of the car whose rent is below 1000
6. Display the car details which I booked by older customer
7. Display the costliest car
8. Display the most experienced employee
9. Display the car details on the particular date
10. Display the employee details and customers details for booked car
11. Display the details of car which is mostly booked
12. Display the customer detail who booked car mostly
13. Display the telephone number, mobile number of employee who are not booked
14. Display the details of the employee who is booked on the particular date
15. Display the rent and speed of each car
16. Enter the details of the customer who booked the car
17. Display all the client id, customer id, employee first name and booked car model s
18. Display the birth dates of customer and employee
19. List the customer details who has same first name
20. Display the average number of the cars booked in a week
21. Count the number of cars
22. Count the number of customers for a particular car
23. Count the number of cars booked by a single customer

24. Display the average rent of the car
25. Display the details of the employ who are having same position

5. CASE STUDY: INVENTORY MANAGEMENT SYSTEM DATA BASE

There are many items in a departmental store, which are sold to customer and purchased from supplier. An order is placed by the customer-required details, which are listed below:

- Item name
- Quantity
- Delivery time

The order processing executes, look up the stock of each item(parts) is available or not then order fulfilled by the management of departmental store. The system periodically checks the stock of each item if it is found below the reorder level then purchase order placed to the supplier for that item, if the supplier is not able to supply whole order then rest of quantity supplied by the another supplier. After fulfilled the formalities, bill generated by the system and sent to the customer. Create a database design to maintained by the management for whole process is being done

Answer to the following Queries

1. Get supplier names for supplier who supply part P2?
2. Get supplier numbers for supplier in Paris with status >20?
3. Get supplier names for suppliers who supply at least one red part?
4. Display supplier names for supplier who supply at least one part supplied by supplier s2?
5. Get supplier names for supplier who supply all parts?
6. Get supplier names for suppliers who do not supply part P2?
7. Find supplier numbers for suppliers who supply at leas all those parts supplied by supplier S2
8. Get a part numbers for parts that either weight more than 16 pounds or are supplied by supplier S2, or both.
9. Display the total shipment quantity?
10. For each part , get the pat number and the total shipment quantity?
11. For each supplier , get the supplier number and the total number of parts supplied?
12. Get all paris of supplier numbers such that the who suppliers are located in the same city?
13. Get color and city for “non paris” parts with weight greater than ten?
14. For all parts , get the number and the weight of that part in grams?
15. Get full details of suppliers?
16. Get part number for all parts supplied by more than one supplier?
17. Get supplier numbers for supplier with less than the current maximum status in the “s” table?
18. Display supplier , parts, quantity for all parts?
19. Change the color of the part from green to brown?
20. Get supplier names for supplier who supply at least one brown part?

6. CASE STUDY: COLLEGE ADMISSION BASED ON THE RANK DATA BASE

It is proposed to develop NON-PERSONAL COMPUTER_BASED MCA ADMISSION SYSTEM. In this system applications need not attend the interview. Admission are made based on rank, reservation claims, sex and order of preference with respect o colleges. The applications will provide the data given below.

I) Identification data

1. Rank
2. HALL-ticket No
3. Name
4. Percentage of marks in degree
5. Date of Birth
6. Reservation Claims
   - Residential status : Local/other
   - Caste : SC/ST/BC-A/BC-B/BC-C/BC-D/OC
   - Special Categories : NCC/CAP/GAMES& SPORTS/PH

- SEX : MEN/WOMEN

II) The order of preference of college data

1. College code
2. Preference(a numeric code where 1 I given for the most preferred college, 2 for the next preferred college and so on)

The college will provide the data given below

1. College code
2. College Name
3. College Location
4. Seat Distribution

Answer to the following Queries

1. Display the order of the preference of college data?
2. Retrieve college name ,address of various college?
3. Give college name seat distribution of that college
4. Find seat distribution, college code for 'GVR college for women'?
5. Display reservation claims for men &women?
6. Find student name who joined with reservation backward caste or games & sports
7. For each student display rank, hall ticket, name, Date of Birth?
8. Display name hall ticket no, name of the student who's rank is 120?
9. Display name , rank of all student who are in between 100 to 200?
10. Find student name , date of birth who name stats with 'Pp?
11. Get the details of hall ticket, date of birth whose name having 5 character?
12. Display student details who joined in the college with ranks (88, 91,97)?
13. List in alphabetic order of student details who have special category
14. Display college names , student hall ticket who joined with a rank above 3000?
15. Display student detail with highest rank in 'Vardhaman'
16. Count how many are joined with open category?
17. Find rank , name of female students with open category?
18. Display each student age who joined in vardhaman?
19. Display student details who having highest %of maks?
20. find student details for second highest rank in college?

7. CASE STUDY: THE RAILWAY RESERVATION SYSTEM DATA BASE

The railway reservation system facilitates the passengers to enquire about the trains available on the basis of source and destination, booking and cancellation of tickets, enquire about the status of the booked ticket, etc. The aim of case study is to design and develop a database maintaining the records of different trains, train status, and passengers. The record of train includes its number, name, source, destination, and days on which it is available, where as record of train status includes dates for which tickets can be booked, total number of seats available, and number of seats already booked.

Answer to the following Queries

1. Display all availability of trains from source to destination?
2. Find unique PNR number , status for the passenger?
3. Display seat status for the passenger?
4. Get the status for particular (Unique) PNR number?
5. Display name of passenger travailing on 21 February 2012 on Bombay expresses?
6. Find the number of tickets booked for a particular train from source to destination?
7. Count the number of cancellation of ticket for particular train?
8. Display the train names stating with 'v'?
9. Get availability of seats for a Gowthami expresses on 28.05.2012?
10. Find the total number seats booked or RAC for santham expresses for sec'bad to Vizag?
11. Count number of trains available on 19.05.2011?
12. Display the name of trains in alphabetical order?

13. cancel RAMLAL ticket for narayana expresses?
14. Update the status of all trains moving from Hyderabad to vizag?
15. Postpone the date of travelling from source to destination?

8. CASE STUDY: HOSPITAL MANAGEMENT SYSTEM DATABASE

In hospital Management system includes registration of patients, storing their details into the system, and also computerized billing in the pharmacy, and labs. The facility to give a unique id for every patient and stores the details of every patient and the staff automatically. It includes a search facility to know the current status of each room. User can search availability of a doctor and the details of a patient using the id. The Hospital Management System can be entered using a username and password. It is accessible either by an administrator or receptionist. Only they can add data into the database. The data can be retrieved easily. The interface is very user-friendly. The data are well protected for personal use and make the data processing very fast.

Functionalities:

1. Efficiently maintains the details about the patient
2. Simultaneously updates changes made to any data, item in the entire data base

Answer to the following Queries

1. List of outgoing patients on 21.05.2012?
2. Find the all patient who are joined in the hospital in alphabetical order?
3. Display doctor name &specialization of each doctor in alphabetical order?
4. How many are taking treatment by Dr. Grace Roy?
5. Find the date of joining for each patient?
6. Display all patient details?
7. Find the RAMLAL Room number?
8. Retrieve facilities available in the hospital?
9. Display disease details& type of treatment of 'LAKSHMI' by 'Dr.Grace.'
10. Display details of the patient who is youngest one in the hospital?
11. Count how many are joined on 30.05.2012 in his hospital?
12. Find the patient name, age who is having same treatment with not less than two members?
13. Display each patient bills (pay amounts) on the 12.05.2012?
14. Display doctor name stating with 'M'?
15. Find the ages of patient whose name begin with B and has at least 3 characters?
16. Find the patient who is better than some patient 'Horatio'
17. Find the patients who is better than every patient 'Horatio'
18. Find PID of patients who reserved the Special Room?
19. Find average age of the patient for each disease that has at least two patients?
20. Find the patient name, doctor name who reserved non a/c room but not A/c room?

PL/SQL PROGRAMS

1. The L& T Pvt.ltd Company has maintaining Employee information contains employee details .The company has four departments. Any employee working in the company belongs to any one of the department. Write a PL/SQL block to insert a record in EMP table and update the salaries of Blake and clerk by 2000 and 1500.Thn check to see that the total salary does not exceed 20000. If total >20000thn undo the updates made to salaries of Blake and clerk?

2. A table Product attributes pno, pname, sales price. A table old price attributes pno, old sales price. If the price of product pool1 is <4000 then change the price to 4000. The price change is to be recorded in the old price table with product number, date on which the price was last changed?

3. Write a PL/SQL block to find the number of occurrences of given digit in a given number.

CURSORS

1. Write a PL/SQL block that will display the name, dept no, salary of fist highest paid employees**.**

2. Update the balance –stock in the item master table each time a transaction takes place in the item transaction table. The change in item master table depends on the itemID is already present in the item master then update operation is performed to decrease the balance stock by the quantity specified in the item transaction in case the itemid is not present in the item master table then the record is inserted in the item master table.

3. The table trans has the following structure acno, transtype, trans date. The table bank has acno, bal, minbal. Assuming that the same acno exists in both tables update the bank table. If transype='d' then Balance=bank.blance+trans.amount. if transtype='w' then balance = bank.balance-trans.amount . Take precaution in case of withdrawals.

FUNCTIONS AND PROCEDURES USING CONTROL STRUCTURES

1. Create a function o find the factorial of a given number and hence find NCR?
2. Write a PL/SQL block o pint prime Fibonacci series using local functions.
3. Create a procedure to find the lucky number of a given birth date?

TRIGGER

1. Convert employee name into uppercase whenever an employee record is inserted or updated. Trigger to fire before the insert or update?
2. Trigger before deleting a record from emp table. Trigger will insert the row to be deleted into table called delete _emp and also record user who has deleted the record and date and time of delete?

SYLLABI FOR V SEMESTER

B. Tech. CSE V SEMESTER

MICROPROCESSORS AND INTERFACING
(Common to CSE & IT)

Course Code: **A1423**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION: Architecture of 8086 microprocessor, Register organization, 8086 flag register and its functions, addressing modes of 8086, Pin diagram of 8086, Minimum mode system operation, Timing diagram.

UNIT - II

8086 FAMILY ASSEMBLY LANGUAGE PROGRAMMING: 8086 Instruction Set, Simple programs, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation, assembler directives, procedures and macros.

UNIT - III

8086 MEMORY AND DIGITAL INTERFACING: 8086 addressing and address decoding, Interfacing RAM, ROM, EPROM to 8086, 8255 programmable Peripheral Interface, various modes of operation and interfacing to 8086, Interfacing keyboard, Interfacing to Alphanumeric Displays, seven segment LED displays, stepper motor, D/A and A/D converter interfacing.

UNIT - IV

INTERRUPTS AND PROGRAMMABLE INTERRUPT CONTROLLERS: 8086 Interrupts and Interrupt Responses introduction to DOS and BIOS interrupts. 8259A Priority Interrupt Controller, Software Interrupt Applications.

The 8086 Maximum Mode, Direct Memory Access (DMA) Data Transfer, Interfacing and Refreshing Dynamic RAMs, 8254 Software-Programmable Timer/Counter.

UNIT - V

SERIAL DATA TRANSFER SCHEMES: Asynchronous and synchronous data transfer schemes, 8251 USART architecture and interfacing, RS - 232C Serial data standard, RS - 423A and RS - 422A, sample program of serial data transfer.

ADVANCED MICROPROCESSORS: Introduction to 80286, salient features of 80386, real and protected mode segmentation and paging.

TEXT BOOKS:

1. Douglas V. Hall (2007), *Microprocessors Interface*, 2nd edition, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. Walter A. Triebel, Avtar Singh (2003), *The 8088 and 8086 Microprocessors* 4th edition, Prentice Hall of India, New Delhi.
2. Mazidi (2000), *The 8051 Microcontroller and Embedded System*, Prentice Hall of India, New Delhi.
3. Deshmukh (2004), *Microcontrollers*, Tata McGraw Hill Edition, New Delhi.

B. Tech. CSE V SEMESTER

SOFTWARE ENGINEERING
(Common to CSE & IT)

Course Code: **A1513**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO SOFTWARE ENGINEEIRN: The Evolving nature of software engineering, Changing nature of software engineering, Software engineering Layers, The Software Processes, Software Myths.

PROCESS MODELS: A Generic Process Model, Waterfall Model, Incremental Process Models, Evolutionary Process Models, Spiral Model, the Unified Process, Personal and Team Process Models, the Capability Maturity Model Integration (CMMI).

UNIT - II

REQUIREMENTS ENGINEERING: Functional and Non-Functional Requirements, The Software requirements Document, Requirements Specification, requirements Engineering, Requirements Elicitation and Analysis, Requirement Validation, Requirement Management, System Modeling: Context Models, Interaction Models, Structural Models, Behavioral Model, Model-Driven Engineering.

DESIGN CONCEPTS: The Design Process, Design Concepts, The Design Models, Architectural Design: Software Architecture, Architectural Genres, Architectural Styles.

UNIT - III

DESIGN AND IMPLEMENTATION: The Object Oriented Design with UML, Design Patterns, Implementation Issues, Open Source Development. User Interface Design: The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation.

SOFTWARE TESTING STRATEGIES: A Strategic approach to Software Testing, Strategic Issues, Test Strategies for Conventional Software, Validation Testing, System Testing, The Art of Debugging, White-Box Testing, Black Box Testing.

UNIT - IV

PRODUCT METRICS: A Frame Work for Product Metrics, Metrics for the Requiremets Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing.

PROCESS AND PROJECT METRICES: Metrics in the Process and Project Domains, Software Measurements, Metrics for Software Quality, Risk Management: Risk verses Proactive Risk Strategies, Software Risks, Risk Identification, Risk Projection, Risk Refinements, Risk Mitigation Monitoring and Management (RMMM), The RMMM Plan.

UNIT - V

QUALITY MANAGEMENT: Quality Concepts, Software Quality, Software Quality Dilemma, Achieving Software Quality, Review Techniques, Reviews: A Formal spectrum, Informal Reviews, Formal Technical Reviews,

SOFTWARE QUALITY ASSURANCE: Background Issues, Elements of Software Quality Assurance, Tasks, Goals and Metrics, Software Reliability, the ISO 9000 Quality Standards.

TEXT BOOKS:

1. Roger S. Pressman (2011), *Software Engineering, A Practitioner's approach,* 7th edition, McGraw Hill International Edition, New Delhi.
2. Sommerville (2001), *Software Engineering,* 9th edition, Pearson education, India.

REFERENCE BOOKS:

1. K. K. Agarval, Yogesh Singh (2007), *Software Engineering,* 3rd edition, New Age International Publishers, India.
2. Lames F. Peters, Witold Pedrycz(2000), *Software Engineering an Engineering approach,* John Wiely & Sons, New Delhi, India.
3. Shely Cashman Rosenblatt (2006), *Systems Analysis and Design*, 6th edition, Thomson Publications, India.

B. Tech. CSE V SEMESTER

UNIX PROGRAMMING
(Common to CSE & IT)

Course Code: **A1514**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO UNIX AND UNIX UTILITIES: A brief history of UNIX, architecture of UNIX, features of UNIX, introduction to vi editor. General purpose utilities, file handling utilities, security by file permissions, process utilities, disk utilities, networking commands, detailed commands to be covered are passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin.

TEXT PROCESSING AND BACKUP UTILITIES: Text processing utilities and backup utilities , detailed commands to be covered are cat, tail, head , sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

UNIT - II

WORKING WITH THE BOURNE AGAIN SHELL (BASH): Shell, shell responsibilities, types of shell, pipes and i/o redirection, shell as a programming language, shell syntax: variables, conditions, control structures, commands, command execution, here documents, and debugging scripts.

UNIX FILE STRUCTURE: Introduction to UNIX file system, inode (Index Node), file descriptors, system calls and device drivers, library functions. Low level file access: open, read, write, close, lseek, stat, fstat, lstat, ioctl, umask, dup and dup2. The Standard i/o library: fopen, fread, fwrite, fclose, fflush, fseek, fgetc, fputc, fgets. Formatted input and output: printf, fprintf, sprint, scanf, fscanf, and sscanf. File and directory maintenance: chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd, scanning directories: opendir, readdir, telldir, seekdir, closedir.

UNIT - III

PROCESS AND SIGNALS: Process, process identifiers, process structure: process table, viewing processes, system processes, process scheduling, starting new processes: waiting for a process, zombie processes, fork, vfork, exit, wait, waitpid, exec, signals functions, unreliable signals, interrupted system calls, kill, raise, alarm, pause, abort, system, sleep functions, signal sets.

DATA MANAGEMENT AND FILE LOCKING: Data Management: managing memory: malloc, free, realloc, calloc, file locking: creating lock files, locking regions, use of read and write with locking, competing locks, other lock commands, deadlocks.

UNIT - IV

INTER PROCESS COMMUNICATION: Pipe, process pipes, the pipe call, parent and child processes, named pipes: fifos, semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

UNIT - V

INTRODUCTION TO SOCKETS: Socket, socket connections - socket attributes, socket addresses, socket, connect, bind, listen, accept, socket communications.

TEXT BOOKS:

1. W. Richard. Stevens (2005), *Advanced Programming in the UNIX Environment*, 1st edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Sumitabha Das (2007), *Your Unix The Ultimate Guide,* Tata Mc graw Hill, New Delhi, India.
2. Neil Matthew, Richard Stones, *Beginning Linux Programming (2011)*, 4th Edition, Wrox, USA.
3. W. Richard Stevens, Bill Fenner, Andrew M. Rudoff, (2002) *UNIX Network Programming - The Sockets Networking API*, 3rd edition, Volume 1, PHI Learning Private Limited India, New Delhi.

B. Tech. CSE V SEMESTER

COMPUTER NETWORKS
(Common to CSE & IT)

Course Code: **A1515**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Network applications, network hardware, network software, reference models: OSI, TCP/IP, Internet, Connection oriented network - X.25, frame relay.

THE PHYSICAL LAYER: Theoretical basis for communication, guided transmission media, wireless transmission, the public switched telephone networks, mobile telephone system.

UNIT - II

THE DATA LINK LAYER: Design issues, error detection and correction, elementary data link protocols, sliding window protocols, example data link protocols - HDLC, the data link layer in the internet.

THE MEDIUM ACCESS SUBLAYER: Channel allocations problem, multiple access protocols, Ethernet, Data Link Layer switching, Wirelwss LAN, Broadband Wireless, Bluetooth

UNIT - III

THE NETWORK LAYER: Network layer design issues, routing algorithms, Congestion control algorithms, Internetworking, the network layer in the internet (IPv4 and IPv6), Quality of Service.

UNIT – IV

THE TRANSPORT LAYER: Transport service, elements of transport protocol, Simple Transport Protocol, Internet transport layer protocols: UDP and TCP.

UNIT - V

THE APPLICATION LAYER: Domain name system, electronic mail, World Wide Web: architectural overview, dynamic web document and http.

APPLICATION LAYER PROTOCOLS: Simple Network Management Protocol, File Transfer Protocol, Simple Mail Transfer Protocol, Telnet.

TEXT BOOKS:

1. A. S. Tanenbaum (2003), *Computer Networks*, 4th edition, Pearson Education/ PHI, New Delhi, India.

REFERENCE BOOKS:

1. Behrouz A. Forouzan (2006), *Data communication and Networking*, 4th Edition, Mc Graw-Hill, India.
2. Kurose, Ross (2010), *Computer Networking: A top down approach,* Pearson Education, India.

B. Tech. CSE V SEMESTER

SYSTEMS PROGRAMMING

Course Code: **A1516**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO SYSTEM PROGRAMMING: Introduction, System Software and Machine Architecture, the Simplified Instruction Computer (SIC), Traditional (CISC) Machines, RISC Machines.

ASSEMBLERS: Basic Assembler Functions, Machine Dependent Assembler Features, Machine Independent Assembler Features, Assembler Design Options, Implementation Examples.

UNIT - II

LOADERS AND LINKERS: Basic Loaders Functions, Design of an Absolute, A Simple Bootstrap Loader, Machine Dependent Loader Features, Relocation, Program Linking, Algorithm and Data Structures for a Linking Loader, Machine Independent Loader Features, Automatic Library Search, Loader Options, Loader Design Options, Linkage Editors Dynamic Linking, Bootstrap Loaders, Implementation Examples, MS-DOS Linker, SunOS Linkers, Cray MPP Linker.

UNIT - III

MACRO PROCESSORS: Basic Macro Processors Functions, Macro Definition and Expansion, Macro Processor Algorithm and Data Structures, Machine Independent Macro Processors Features, Concatenation of Macro Parameters, Generation of Unique Labels, Conditional Macro Expansion, Keyword Macro Parameters, Macro Processor Design Options, Recursive Macro Expansion, General Purpose Macro Processors, Macro Processing Within Language Translators, Implementation Examples, MASM Macro Processor, ANSI C Macro Language, The ELENA Macro Processor.

UNIT - IV

OPERATING SYSTEMS: Basic Operating System Functions, Machine Dependent Operating System Features, Machine Independent Operating System Features, Operating System Design Options, Implementation Examples, MS-DOS, Windows 95, SunOS, UNICOS/Mk, Amoeba.

UNIT - V

SYSTEM SOFTWARE: Embedded System Software, Mobile System Software, Android Platform System Software, Cloud Computing and Virtualization.

TEXT BOOKS:

1. L. L. Beck (1997), *System software: An introduction to system programming,* 3rd edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. John J. Donovan (1991), *Systems Programming,* Tata McGraw - Hill Publishing Company Limited, New Delhi.
2. D. M. Dhamdhere (1999), *Systems Programming and Operating Systems*, 2nd revised edition, Tata McGraw - Hill Publishing Company Limited, New Delhi.
3. I. A. Dhotre, A. A. Puntambekar (2008), Systems Programming, Technical Publications, Pune.

B. Tech. CSE V SEMESTER

DESIGN AND ANALYSIS OF ALGORITHMS
(Common to CSE & IT)

Course Code: **A1517**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION: Algorithm, pseudo code for expressing algorithms, performance analysis-space complexity, time complexity, asymptotic notation- big (O) notation, omega notation, theta notation and little (o) notation, recurrences, probabilistic analysis, disjoint set operations, union and find algorithms.

DIVIDE AND CONQUER: General method, applications-analysis of binary search, quick sort, merge sort, strassen's matrix multiplication, finding the maxima and minima.

UNIT - II

GREEDY METHOD: General method, applications-job sequencing with dead lines, 0/1 knapsack problem, minimum cost spanning trees, single source shortest path problem, optimal storage on tapes.

GRAPHS (Algorithm and Analysis): Graphs-breadth first search and traversal, depth first search and traversal, spanning trees, connected components and biconnected components, articulation points.

UNIT - III

DYNAMIC PROGRAMMING: General method, applications-matrix chain multiplication, optimal binary search trees, 0/1 knapsack problem, all pairs shortest path problem, travelling sales person problem, reliability design, string editing.

UNIT - IV

BACKTRACKING: General method, applications-n-queen problem, sum of subsets problem, graph colouring, 0/1 knapsack problem, Hamiltonian cycles.

BRANCH AND BOUND: General method, applications - travelling sales person problem, 0/1 knapsack problem- LC branch and bound solution, FIFO branch and bound solution.

UNIT - V

LOWER BOUND THEORY: Comparison trees, oracles and adversary arguments, lower bounds through reductions.

NP-HARD AND NP-COMPLETE PROBLEMS: Basic concepts, non-deterministic algorithms, NP-hard and NP-complete classes, cook's theorem.

TEXT BOOKS:

1. Ellis Horowitz, Satraj Sahni, Rajasekharam(2007), *Fundamentals of Computer Algorithms*, 2nd edition, University Press, New Delhi.

REFERENCE BOOKS:

1. R. C. T. Lee, S. S. Tseng, R.C. Chang and T. Tsai (2006), *Introduction to Design and Analysis of Algorithms A strategic approach*, McGraw Hill, India.
2. Allen Weiss (2009), *Data structures and Algorithm Analysis in C++*, 2nd edition, Pearson education, New Delhi.
3. Aho, Ullman, Hopcroft (2009), *Design and Analysis of algorithms*, 2nd edition, Pearson education, New Delhi.

B. Tech. CSE V SEMESTER

MICROPROCESSORS AND INTERFACING LAB
(Common to CSE & IT)

Course Code: **A1427**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

- **MICROPROCESSOR 8086:**

1. Programs involving data Transfer Instructions
   a. Byte and word transfer in different addressing modes
   b. Block move Without overlapping
   c. Block move With overlapping
   d. Block interchanging

2. Programs involving arithmetic and logical operations like addition and subtraction of multi precision numbers
   a. Addition and Subtraction of Multi precision numbers
   b. Multiplication and division of signed and unsigned Hexadecimal numbers
   c. ASCII adjustment instructions
   d. Code Conversion
   e. Arithmetic program to find square ,cube ,LCM ,GCD and factorial

3. Programs involving bit manipulation instructions like checking
   a. If given data is positive or negative
   b. If given data is odd or even
   c. Logical ones and zeros in a given data
   d. 2 out of 5 code
   e. Bit wise palindrome
   f. Nibble wise palindrome

4. Programs involving Branch / Loop instructions like :
   a. Programs on arrays : addition/subtraction of N nos., finding largest/smallest no., ascending/descending order, etc.
   b. Near and Far Conditional and Unconditional jumps, Calls and Returns

5. Programs on String Manipulations like string transfer, string reversing, searching for a character in a string, palindrome etc.

6. Programs involving on Software Interrupts

7. Programs to use DOS interrupt INT 21H Function calls For:
   a. Reading a Character from Keyboard, Buffer Keyboard input
   b. Display of characters/String on console
   c. Creation of a new file, read/write from a file,
   d. Read system date, set system date, read system time, set system time

- **INTERFACING 8086:**

1. Experiments on interfacing 8086 with the following modules through 8255 PPI / 8257 DMA / 8259 PIC
   a. A/D and D/A converters
   b. Matrix keyboard interface
   c. Seven segment display interface
   d. Logical controller interface
   e. Stepper motor interface
   f. Traffic signals by interfacing traffic controller to 8086
   g. Real time Clock using PIT 8253/8254

2. Interfacing a printer to an 8086 Microcomputer kit

B. Tech. CSE V SEMESTER

UNIX PROGRAMMING LAB
(Common to CSE & IT)

Course Code: **A1518**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. Study and Practice on various commands like
   man, passwd, tty, script, clear, date, cal, cp, mv, ln, rm, unlink, mkdir, rmdir, du, df, mount, umount, find, unmask, ulimit, ps, who, w.

2. Study and Practice on various commands like
   cat, tail, head , sort, nl, uniq, grep, egrep,fgrep, cut, paste, join, tee, pg, comm, cmp, diff, tr, awk, tar, cpio.

3. a) Write a Shell Program to print all .txt files and .c files.
   b) Write a Shell program to move a set of files to a specified directory.
   c) Write a Shell program to display all the users who are currently logged in after a specified time.
   d) Write a Shell Program to wish the user based on the login time.

4. a) Write a Shell program to pass a message to a group of members, individual member and all.
   b) Write a Shell program to count the number of words in a file.
   c) Write a Shell program to calculate the factorial of a given number.
   d) Write a Shell program to generate Fibonacci series.

5. a) Write a Shell program to print all prime numbers between 1 and n.
   b) Write a Shell program to count no of lines in a text file which starts with a specified letter (Use grep command).

6. a) Simulate **cat** command. b) Simulate **cp** command.

7. a) Simulate **head** command. b) Simulate **tail** command.

8. a) Simulate **mv** command. b) Simulate **nl** command.

9. Write a program to handle the signals like **SIGINT, SIGQUIT, SIGFPE**.

10. Implement the following IPC forms
    a) **FIFO** b) **PIPE**

11. Implement **message queue** form of IPC.

12. Implement **shared memory** form of IPC.

13. Write a Socket program to print system date and time (Using TCP/IP).

SYLLABI FOR VI SEMESTER

B. Tech. CSE VI SEMESTER

EMBEDDED SYSTEMS
(Common to CSE & IT)

Course Code: **A1430**

L	T	P	C
4	-	-	4

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.
3. David E. Simon (1999), *An Embedded Software Primer*, Pearson Education, India.

REFERENCE BOOKS:

1. Jean J. Labrosse (2000), Embedding System Building Blocks, 2nd edition, CMP publishers, USA.
2. Raj Kamal (2004), *Embedded Systems*, Tata McGraw hill, India.
3. Ajay V. Deshmukh (2005), *Micro Controllers*, Tata McGraw hill, India.
4. Frank Vahid, Tony Givargis (2002), *Embedded System Design*, John Wiley, India.

B. Tech. CSE VI SEMESTER

NETWORK SECURITY AND CRYPTOGRAPHY

Course Code: **A1606**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Security trends, The OSI Security Architecture, Security Attacks, Security Services and Security Mechanisms, A model for Network security.

CLASSICAL ENCRYPTION TECHNIQUES: Symmetric Cipher Modes, Substitute Techniques, Transposition Techniques, Rotor Machines, Stenography.

UNIT - II

BLOCK CIPHER AND DATA ENCRYPTION STANDARDS: Block Cipher Principles, Data Encryption Standards, the Strength of DES, Differential and Linear Crypt Analysis, Block Cipher Design Principles.

ADVANCED ENCRYPTION STANDARDS: Evaluation Criteria for AES, the AES Cipher.

MORE ON SYMMETRIC CIPHERS: Multiple Encryption, Triple DES, Block Cipher Modes of Operation, Stream Cipher and RC4.

INTRODUCTION TO NUMBER THEORY: Prime Numbers, Fermat's and Euler's Theorem, Testing for Primality, The Chinese Remainder Theorem, Discrete logarithms,

UNIT - III

PUBLIC KEY CRYPTOGRAPHY AND RSA: Principles Public key crypto Systems the RSA algorithm, Key Management, Diffie Hellman Key Exchange, Elliptic Curve Arithmetic, Elliptic Curve Cryptography.

MESSAGE AUTHENTICATION AND HASH FUNCTIONS: Authentication Requirement, Authentication Function, Message Authentication Code, Hash Function, Security of Hash Function and MACs.

HASH AND MAC ALGORITHM: Secure Hash Algorithm, Whirlpool, HMAC, CMAC.

DIGITAL SIGNATURE: Digital Signature, Authentication Protocol, Digital Signature Standard.

UNIT - IV

AUTHENTICATION APPLICATION: Kerberos, X.509 Authentication Service, Public Key Infrastructure.

EMAIL SECURITY: Pretty Good Privacy (PGP) and S/MIME.

IP SECURITY: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

UNIT - V

WEB SECURITY: Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Intruders, Viruses and related threats.

FIREWALL: Firewall Design principles, Trusted Systems.

TEXT BOOKS:

1. William Stallings (2006), *Cryptography and Network Security: Principles and Practice*, 4th edition, Pearson Education, India.
2. William Stallings (2000), *Network Security Essentials (Applications and Standards)*, Pearson Education, India.

REFERENCE BOOKS:

1. Charlie Kaufman (2002), *Network Security: Private Communication in a Public World*, 2nd edition, Prentice Hall of India, New Delhi.
2. Atul Kahate (2008), *Cryptography and Network Security,* 2nd edition, Tata Mc Grawhill, India.
3. Robert Bragg, Mark Rhodes (2004), *Network Security: The complete reference,* Tata Mc Grawhill, India.

B. Tech. CSE VI SEMESTER

LANGUAGE PROCESSORS
(Common to CSE & IT)

Course Code: **A1519**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO COMPILERS: Definition of compiler, interpreter and its differences, the phases of a compiler, role of lexical analyzer, regular expressions, finite automata, from regular expressions to finite automata, pass and phases of translation, bootstrapping, LEX-lexical analyzer generator.

PARSING: Parsing, role of parser, context free grammar, derivations, parse trees, ambiguity, elimination of left recursion, left factoring, eliminating ambiguity from dangling-else grammar, classes of parsing, top down parsing - backtracking, recursive descent parsing, predictive parsers, LL(1) grammars.

UNIT - II

BOTTOM UP PARSING: Definition of bottom up parsing, handles, handle pruning, stack implementation of shift-reduce parsing, conflicts during shift-reduce parsing, LR grammars, LR parsers-simple LR, canonical LR(CLR) and Look Ahead LR (LALR) parsers, error recovery in parsing, parsing ambiguous grammars, YACC-automatic parser generator.

UNIT - III

SYNTAX DIRECTED TRANSLATION: Syntax directed definition, construction of syntax trees, S-attributed and L-attributed definitions, translation schemes, emitting a translation.

INTERMEDIATE CODE GENERATION: intermediate forms of source programs– abstract syntax tree, polish notation and three address code, types of three address statements and its implementation, syntax directed translation into three-address code, translation of simple statements, boolean expressions and flow-of-control statements.

UNIT - IV

TYPE CHECKING: Definition of type checking, type expressions, type systems, static and dynamic checking of types, specification of a simple type checker, equivalence of type expressions, type conversions, overloading of functions and operators.

RUN TIME ENVIRONMENTS: Source language issues, Storage organization, storage-allocation strategies, access to non local names, parameter passing, symbol tables and language facilities for dynamic storage allocation.

UNIT - V

CODE OPTIMIZATION: Organization of code optimizer, basic blocks and flow graphs, optimization of basic blocks, the principal sources of optimization, the directed acyclic graph (DAG) representation of basic block, global data flow analysis.

CODE GENERATION: Machine dependent code generation, object code forms, the target machine, a simple code generator, register allocation and assignment, peephole optimization.

TEXT BOOKS:

1. Alfred V. Aho, Ravi Sethi, Jeffrey D. Ullman (2007), *Compilers Principles, Techniques and Tools*, 2nd edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Alfred V. Aho, Jeffrey D. Ullman (2001), *Principles of compiler design*, Indian student edition, Pearson Education, New Delhi, India.
2. Kenneth C. Louden(1997), *Compiler Construction– Principles and Practice*, 1st edition, PWS Publishing.
3. K. L. P Mishra, N. Chandrashekaran (2003), *Theory of computer science- Automata Languages and computation*, 2nd edition, Prentice Hall of India, New Delhi, India.
4. Andrew W. Appel (2004), *Modern Compiler Implementation C*, Cambridge University Press, UK.

B. Tech. CSE VI SEMESTER

OBJECT ORIENTED DESIGN AND PATTERNS
(Common to CSE & IT)

Course Code: **A1520**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO UML: Introduction to object oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modeling, Principles of modeling, Object oriented modeling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle.

BASIC STRUCTURAL MODELING: *Classes:* Terms and concepts, Common modeling techniques; *Relationships:* Modeling simple dependencies, Single inheritance and structural relationships; Common mechanisms and diagrams.

ADVANCED STRUCTURAL MODELING: Advance classes, Advance relationships, Interfaces, Types and Roles, Packages, Instances.

UNIT - II

THE OBJECT-ORIENTED DESIGN PROCESS: The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using javadoc for design documentation, *Case Study:* A voice mail system.

UNIT - III

GUIDELINES FOR CLASS DESIGN: An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing.

INTERFACE TYPES AND POLYMORPHISM: The icon interface type, polymorphism, drawing shapes, the comparable interface type, the comparator interface type, anonymous classes, frames and user interface components, user interface actions, timers, designing an interface type.

UNIT - IV

PATTERNS AND GUI PROGRAMMING: Iterator, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns to work.

INHERITANCE AND ABSTRACT CLASSES: The concept of inheritance, graphics programming with inheritance, abstract classes, the template method pattern, protected interfaces, the hierarchy of swing components, the hierarchy of standard geometric shapes, the hierarchy of exception classes, when not to use inheritance.

UNIT - V

FRAMEWORKS: Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework.

MULTITHREADING: Thread basics, Thread synchronization, Animations.

MORE DESIGN PATTERNS: The adapter pattern, Actions and the command pattern, the factory method pattern, the proxy pattern, the singleton pattern, the visitor pattern, other design patterns.

TEXT BOOKS:

1. Grady Booch, James Rumbaugh, Ivar Jacobson (2009), *The Unified Modeling Language User guide*, 2nd edition, Pearson Education, New Delhi, India.
2. Cay Horstmann(2004), *Object-Oriented Design And Patterns*, Wiley India edition, New Delhi, India.

REFERENCE BOOKS:

1. Meilir Page-Jones (2000), *Fundamentals of Object Oriented Design in UML*, Pearson Education, New York.
2. Craig Larman(2005), *An introduction to Object –Oriented Analysis and Design and Unified Process Appling UML and Patterns*, 3rd edition, Pearson Education, New Delhi, India.
3. John W. Satzinger, Robert B Jackson, Stephen D Burd(2004), *Object-Oriented Analysis and Design with the Unified Process*, Cengage learning, India.

B. Tech. CSE VI SEMESTER

C# AND .NET FRAMEWORK
(Common to CSE & IT)

Course Code: **A1521**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCING C# AND THE .NET PLATFORM: The Philosophy of .NET, The .NET Solution, Building Blocks of the .NET platform(the CLR, CTS, and CLS), Additional .NET-Aware Programming Languages, An Overview of .NET Assemblies, Understanding the CTS, CLS, and CLR, The Assembly / namespace / Type Distinction, Exploring an Assembly Using ildasm.exe, Exploring an Assembly Using Reflector, The Platform-Independent Nature of .NET.

BUILDING C# APPLICATION: The Role of the .NET Framework 4.0 SDK, Building C# Applications Using csc.exe, Building .NET Applications Using Notepad++, Building .NET Applications Using SharpDevelop, Building .NET Applications Using Visual C# 2010 Express, Building .NET Applications Using Visual Studio 2010.

UNIT - II

CORE C# PROGRAMMING CONSTRUCTS PART - I: The Anatomy of Simple C# Program, Environment Class, The Syste.Console Class, System Data Types and C# Shorthand notation, Working with String data, Narrowing and Widening Data Type Local Variables, C# Iteration Constructs, Decision Constructs and the relational / Equality Operators.

CORE PROGRAMMING CONSTRUCTS PART-II: Methods and Parameter Modifiers, Understanding C# Arrays, Understanding the Enum Type, Understanding the Structure Type, Understanding Value Types and Reference Types, Understanding C# Nullable Type.

UNIT - III

UNDERSTANDING INHERITANCE AND POLYMORPHISM: The Basic Mechanics of Inheritance, revising Visual Studio Class Diagrams, Defining the Pillars of OOP, The First Pillar, The Second Pillar of OOP, The Third Pillar of OOP, Understanding Base Class / Derived Class Casting Rules, The Master Parent Class.

UNDERSTANDING STRUCTURED EXCEPTION HANDLING: ODE to Errors, Bugs, and Exceptions, The Role of .NET Exception Handling, The Simplest Possible Example, Configuring the State of an Exception, System-Level Exceptions, application-Level Exceptions, Processing Multiple Exceptions.

UNIT - IV

DELEGATES AND EVENTS: Understanding the .NET Delegate type, defining a Delegate Type in C#, The System.MulticastDelegate and System.Delegate Base Classes, The Simple Possible Delegate Example, Sending Object State Notification using Delegates.

PROGRAMMING WITH .NET ASSEMBLIES: Configuring .NET Assemblies, defining Custom Namespaces, The role of .NET Assemblies, Understanding the Format of a .NET assembly, Building and Consuming a Single-File Assembly, Building and Consuming a Multifile Assembly, Understanding Private Assembly, Understanding Shared Assembly, Consuming a Shared Assembly, Configuring Shared assemblies, Understanding Publisher Policy assemblies, Understanding the <codebase> Element, The System.Configuration Namespace.

UNIT - V

ADO.NET PART - I: The Connected Layer: A High-Level Definition of ADO.NET, Understanding ADO.NET Data Provider, Additional ADO.NET Namespaces, The Types of the System.Data.namespace, Abstracting Data Providers Using Interfaces, Creating the AutoLot Database, The ADO.NET data Provider Factory Model, Understanding the Connected Layer of Ado.NET, Working with Data Readers, Building a reusable Data Access Library, Creating a Console UI-Based Front End, Understanding Database Transactions.

ADO.NET PART - II: Disconnected Layer: Understanding the Disconnected Layer of ADO.NET, Understanding the Role of the Dataset, Working with DataColumns, Working with Datarows, Working with DataTables, Binding with Data Adapters, Adding Disconnected Functionality to AutoLotDAL.dll, Multitabled Dataset Objects and Data Relationships, the Windows Forms Database Code into a Class Library, Programming with LINQ to DataSet.

TEXT BOOKS:

1. Andrew Troelsen (2010), *Pro C# and the .NET 4 Platform*, 5th edition, Springer (India) Private Limited, New Delhi, India.

REFERENCE BOOKS:

1. E. Balagurusamy (2004), *Programming in C#,* 5th edition, Tata McGraw-Hill, New Delhi, India.
2. Herbert Schildt (2004), *The Complete Reference: C#,* Tata McGraw-Hill, New Delhi, India.
3. Simon Robinson, Christian Nagel, Karli Watson, Jay Gl (2006), *Professional C#*, 3rd edition, Wiley & Sons, India.

B. Tech. CSE VI SEMESTER

HUMAN VALUES AND ETHICS
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1016**

L	T	P	C
4	-	-	4

UNIT - I

HUMANVALUES: Morals, values and ethics, integrity, work ethic, service learning, civic virtue, respect for others, living peacefully, caring, sharing, honesty, courage, valuing time, co-operation, commitment, empathy, self-confidence, character and spirituality.

UNIT - II

ENGINEERING ETHICS: Senses of 'Engineering Ethics', variety of moral issued, types of inquiry, moral dilemmas, moral autonomy, Kohlberg's theory, Gilligan's theory, consensus and controversy, models of professional roles, theories about right action, self-interest, customs and religion, uses of ethical theories.

UNIT - III

ENGINEERING AS SOCIAL EXPERIMENTATION: Engineering as experimentation, engineers as responsible experimenters, codes of ethics, a balanced outlook on law, the challenger case study.

UNIT - IV

SAFETY, RESPONSIBILITIES AND RIGHTS: Safety and risk, assessment of safety and risk, risk benefit analysis and reducing risk, the Three Mile Island and Chernobyl case studies. Collegiality and loyalty, respect for authority, collective bargaining, confidentiality, conflicts of interest, occupational crime, professional rights, employee rights, Intellectual Property Rights (IPR), discrimination.

UNIT - V

GLOBAL ISSUES: Multinational corporations, environmental ethics, computer ethics, weapons development, engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of ethics like ASME, ASCE, IEEE, institution of engineers (India), Indian institute of materials management, institution of electronics and telecommunication engineers (IETE),India, etc.

TEXT BOOKS:

1. Mike Martin, Roland Schinzinger(1996), *Ethics in Engineering*, McGraw-Hill, New York.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S (2004), *Engineering Ethics*, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:

1. Charles D. Fleddermann(2004), *Engineering Ethics*, Pearson Education / Prentice Hall, New Jersey.
2. Charles E Harris, Michael S. Protchard, Michael J Rabins(2000), *Engineering Ethics - Concepts and Cases*, Wadsworth Thompson Learning, United States.
3. John R Boatright(2003), *Ethics and the Conduct of Business*, Pearson Education, New Delhi.
4. Edmund G Seebauer and Robert L Barry, (2001), *Fundamentals of Ethics for Scientists and Engineers,* Oxford University Press, New York.

B. Tech. CSE VI SEMESTER

HUMAN RESOURCE MANAGEMENT
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1017**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION HUMAN RESOURCE MANAGEMENT: Introduction and significance of HRM, Scope, functions of HRM, changing environment of HRM and Challenges. Human Resource Planning, Objectives, Factors influencing Human Resource planning, HR Planning Process.

UNIT - II

JOB ANALYSIS AND RECRUITMENT: Process and Sources of Recruitment; Selection, process of selection and techniques, Retention of Employees.

UNIT - III

HUMAN RESOURCES DEVELOPMENT: Training Vs Development, Need, Process of training, Methods of training, Training Evaluation, Career planning, Performance Management System, Methods of Appraisal, Common Errors.

UNIT - IV

COMPENSATION MANAGEMENT: Concepts and components of wages, Factors influencing wage fixation, Job evaluation, Methods of payment, Incentives and Fringe benefits.

UNIT - V

MANAGING INDUSTRIAL RELATIONS: Components of Industrial Relation, Trade Unions, functions of Trade Union, Employee Participation, Importance and Schemes, Collective Bargaining, Grievance Redressal, Industrial Dispute Settlement machinery.

TEXT BOOKS:

1. Biswajeet Pattnayak (2009), *Human Resource Management*, Prentice hall of India, New Delhi, India.
2. R. Wayne Mondy and Robert M. Noe (2009), *Human Resource Management*, Pearson, India.

REFERENCE BOOKS:

1. Aswathappa. K. (2007), *Human Resources and Personnel Management*, Tata MC Graw Hill, New Delhi, India.
2. Monappa. A, Saiyadain. M. (1979), *Personnel Management*, Tata Mc Graw Hill, New Delhi, India.
3. C. B. Mamoria (2003), *Personnel Management*, Himalaya Publishing House, India.

B. Tech. CSE VI SEMESTER

ENTERPRENEURSHIP
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1018**

L	T	P	C
4	-	-	4

UNIT - I

ENTREPRENEURSHIP: Importance and role of entrepreneurship, Characteristics of entrepreneurship, Qualities of an entrepreneur, Functions of entrepreneur; Theories of entrepreneurship, Stimulants of entrepreneurship and Barriers to entrepreneurship, Ethics and Social Responsibility, Role of entrepreneur in economic development.

UNIT - II

INSTITUTIONAL SUPPORT: Role of Government; Role of IDBI, SIDBI, SIDO, NIESBUD, SISI, DIC, Entrepreneurship Development Institute, MSMEs.

UNIT - III

WOMEN ENTREPRENEURSHIP: Role & Importance, Functions of women entrepreneur, Profile of Indian Women Entrepreneur, Problems of Women Entrepreneurs, Women Entrepreneurship Development in India and in Foreign Countries.

UNIT - IV

PROJECT MANAGEMENT: Concept of project and classification of project identification, project formulation - project report - project design, Project appraisal - profitability appraisal - project planning - social cost benefit analysis - financial analysis and project financing.

UNIT - V

TRAINING: Designing appropriate training programmes to inculcate Entrepreneurial Spirit, significance of entrepreneurial training, Training for New and Existing Entrepreneurs, Feedback and Performance of Trainees.

TEXT BOOKS:

1. Robert Hisrich, Michael P. Peter, Dean A. Shepherd (2010), E*ntrepreneurship*, Tata Mc Graw Hill, New Delhi.

REFERENCE BOOKS:

1. Bholanath Datta (2009), *Entrepreneurship*, Excel publications, India.
2. David H Holt (2010), *Entrepreneurship*, Prentice hall of India, New Delhi, India.

B. Tech. CSE VI SEMESTER

BUSINESS COMMUNICATION
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1019**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO MANAGERIAL COMMUNICATION: Meaning, Importance and objectives, Principles of Communication, Forms of communication, Communication Process, Barriers To effective communication, Gateways to effective communication.

UNIT - II

NONVERBAL COMMUNICATION: Body Language, Gestures, Postures, Facial Expressions, Dress Code. Listening and Speaking Skills, Probing questions, Observation, Business and Social etiquette.

UNIT - III

MANAGERIAL SPEECHES: Principles of Effective Speech & Presentations. Technical and Non-technical presentations. Speech of introduction, speech of thanks, occasional speech, theme speech, Use of audio visual aids.

UNIT - IV

INTERVIEW TECHNIQUES: Mastering the art of conducting and giving interviews, Placement interviews, discipline/technical interviews, appraisal interviews, exit Interviews. *Group communication*: Importance, Meetings, group discussions, Video conferencing.

UNIT - V

INTRODUCTION TO BUSINESS CORRESPONDENCE: *Business letters*: Enquiries, Circulars, Quotations, Orders, Acknowledgments, Executions, Complaints, Persuading letters, Sales letters, Job application letters, Bio-data, Covering Letter, Interview Letters, Letter of Reference, Memos, minutes, Circulars and Notices. *Reports:* Types of Business Reports - Format, Choice of vocabulary, Coherence, paragraph writing, organization reports by individual, Report by committee.

TEXT BOOKS:

1. Lesikar R. V, Flatley M. E (2005), *For Empowering the Internet Generation*, Tata McGraw Hill Publishing Company Ltd., New Delhi, India.
2. Ludlow. R, Panton. F (1998), *The Essence of Effective Communications*, Prentice Hall of India Pvt. Ltd., New Delhi, India.

REFERENCE BOOKS:

1. Adair .J (2003), *Effective Communication,* Pan Macmillan, London.
2. Pan Mcmillan Thill J. V, Bovee G. L (1993), *Excellence in Business Communication,* Tata McGraw Hill, New York.
3. Bowman J.P, Branchaw P. P (1987), *Business Communications: From Process to Product*, Dryden Press, Chicago.

B. Tech. CSE VI SEMESTER

INTELLECTUAL PROPERTY AND PATENT RIGHTS
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1020**

L	T	P	C
4	-	-	4

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 trademarks, 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 regisffation, 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 secrete litigation.

UNFAIR COMPETITION: 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, and international development trade secrets law.

TEXT BOOKS:

1. Deborah. E. Bouchoux (2009*), Intellectual property*, Cengage learning, India.
2. Deborah. E. Bouchoux (2001), *Protecting your companies intellectual property*, AMACOM, USA.

REFERENCE BOOKS:

1. Prabudda ganguli (2003), *Intellectual property right*, Tata McGraw Hill Publishing company ltd., India.
2. Robert Hisrich, Michael P. Peter, Dean A. Shepherd (2010), *Entrepreneurship*, Tata Mc Graw Hill., India.

B. Tech. CSE VI SEMESTER

PROJECT PLANNING AND MANAGEMENT
Interdepartmental Elective - I
(Common to CSE, IT & ECE)

Course Code: **A1021**

L	T	P	C
4	-	-	4

UNIT - I

PERT AND CPM : Introduction, origin of PERT and CPM, planning, scheduling and controlling, bar charts, milestone charts, weaknesses in bar charts, PERT and CPM networks comparison, event, activity, rules for drawing networks, numbering the events (Fulkerson's law), dummy activities.

UNIT - II

CPM - PERT NETWORK ANALYSIS : Time estimate, expected time, earliest allowable occurrence time, latest allowable occurrence time, slack, project duration, probability of completion, start and finish time estimates, floats, project scheduling, critical and sub-critical path. Updating - process of updating, when to update.

UNIT - III

CPM COST MODEL & RESOURCES ALLOCATIONS, RESOURCE SCHEDULING : Cost analysis, direct and indirect costs, operation time, normal and crash times and costs, optimizing project cost, crash limit, free float limit, optimization. Resource smoothening, resource leveling.

UNIT - IV

MANAGEMENT: Scope of construction management, significance of construction management, concept of scientific management, psychology in management, a historical account of management philosophy, qualities of manager, the roles/functions performed by effective and competent managers, the manager - as a decision maker, as a motivator, as a communication-link, as a conflict resolver, as a well wisher of co-employees and the employer etc.

UNIT - V

ORGANIZATION: Types of organization, merits and demerits of different types of organization, authority, policy, recruitment process and training; development of personnel department; labor problems; labor legislation in India; 'workmen's compensation act of 1923 and minimum wages act of 1948', and subsequent amendments. Safety in construction.

TEXT BOOKS:

1. Punmia, Khandelwal (2006), *Project planning and control with PERT and CPM*, 3rd edition, Laxmi Publications, New Delhi, India.

REFERENCE BOOKS:

1. L. S. Srinath (1975), *PERT and CPM*, 2nd Edition, Afflicted East West Press Pvt. Ltd, New Delhi, India.
2. U. K. Shrivastava (1999), Construction Planning and Management, Galgotia Publications Pvt. Ltd., New Delhi, India.

B. Tech. CSE VI SEMESTER

OBJECT ORIENTED DESIGN AND PATTERNS LAB
(Common to CSE & IT)

Course Code: **A1522**

L	T	P	C
-	-	3	2

I. OBJECT ORIENTED ANALYSIS (UML) LAB EXPERIMENTS:

Case studies given below should be Modeled using Rational Rose tool in different views i.e Use case view, logical view, component view, Deployment view.

CASE STUDY 1: LIBRARY INFORMATION SYSTEM

Problem Statement:

A library lends books and magazines to members, who are registered in the system. Also it handles the purchase of new titles for the library. Popular titles are bought in multiple copies. A member can reserve a book or magazine that is not currently available in the library, so that when it is returned by the library that person is notified. The library can easily create, update and delete information about the titles, members, loans and reservations in the systems.

CASE STUDY 2: A POINT OF SALE (POS) SYSTEM

Problem Statement:

A POS System is a computerized application used to record sales and handle payments; it is typically used in a retail store. It includes hardware components such as a computer and bar code scanner, and software to run the system. It interfaces to various service applications, such as a third-party tax calculator and inventory control. These systems must be relatively fault tolerant; that is, even if remote services and temporarily unavailable they must still be of capturing sales and handling at least cash payments. A POS system must support multiple and varied client – side terminals and interfaces such as browser, PDA's, touch – screens.

CASE STUDY 3: AUTOMATED TELLER MACHINE (ATM)

Problem Statement:

Software is designed for supporting a computerized ATM banking network. All the process involved in the bank is computerized these days. All the accounts maintained in the bank and also the transactions effected, including ATM transactions are to be processed by the computers in the bank. An ATM accepts a relevant cash card, interacts with user, communicates with the central system to carry out the transaction, dispenses cash, and prints receipts. The system to be designed and implemented must include appropriate record keeping and security provisions. The system must handle concurrent access to the same account.

CASE STUDY 4: ONLINE TICKET RESERVATION FOR RAILWAYS

Problem Statement:

Computer play an integral part of the day in today's life. It makes the entire job easier and faster, every job is computerized so as the ticket reservation we can book over the online ticket reservation system. During the booking of the ticket reservation passenger has to select origin, date of journey, destination, class of train etc. The reservation counter keeps track of passenger's information. Thus the system will have all the details about the trains and facilities provided by them. There are various trains with the different level of convenience for the passengers. The whole database will be maintained by database administrator. There are varieties of trains where the passengers can select the train according to the convenience for their destination journey. The journey could be within the state or across the India. Each train has the three types of classes i.e. Sleeper class, First class and the AC compartment. Design the application for the above problem description.

CASE STUDY 5: RECRUITMENT PROCEDURE FOR SOFTWARE INDUSTRY

Problem Statement:

In the software industry the recruitment procedure is the basic thing that goes in the hand with the requirement as specified by the technical management team. HR first gives an advertisement in leading Newspapers, Journals, Weeklies and Websites. The job seekers can apply for it through by Post or by e-mail to the company.

The technical skill and the experience of the candidates are reviewed and the short listed candidates are called for the interview.

There may be different rounds for interview like the written test, technical interview, HR interview. After the successful completion of all rounds of interview, the selected candidates names are displayed. Mean while HR gives all the details about the salary, working hours, terms and conditions and the retirement benefit to the candidate.

CASE STUDY 6: DESIGN A STUDENT REGISTRATION SYSTEM

Problem Statement:

Each student has access to his or her course and grade information only and must be authenticated prior to viewing or updating the information. A course instructor will use the system to view the list of courses he or she is assigned for a given semester or has taught previously, view the list of students registered for the course(s) he or she is teaching and record final grades for each student in the course(s). TA assignments will also be viewable through this system. Instructors must also be authenticated prior to viewing or updating any information.

CASE STUDY 7: ONLINE AUCTION SALES

Problem Statement:

The online auction system is a design about a website where sellers collect and prepare a list of items they want to sell and place it on the website for visualizing. To accomplish this purpose the user has to access the site. Incase it's a new user he has to register. Purchaser's login and select items they want to buy and keep bidding for it. Interacting with the purchasers and sellers through messages does this. There is no need for customer to interact with the sellers because every time the purchasers bid, the details will be updated in the database. The purchaser making the highest bid for an item before the close of the auction is declared as the owner of the item. If the auctioneer or the purchaser doesn't want to bid for the product then there is fixed cutoff price mentioned for every product. He can pay that amount directly and own the product. The purchaser gets a confirmation of his purchase as an acknowledgement from the website. After the transition by going back to the main menu where he can view other items.

B. DESIGN PATTERNS LAB EXPARIMENTS

1. Write a program to define one to many dependency relationship between the objects so that one object changes its state, all its dependents are notified and updated automatically using MVC relations.
2. Write a program to build the components of maze for computer game applications using creational patterns.
3. Write a program to create online help system like chain which are request receiving objects and pass the request along the chain until an object handles the request using chain of responsibility mechanism.
4. Write a program to make any subsystem easier within a compiler system by providing the unified Interface to a set of interfaces within compiler.
5. Write a program to add additional properties and behaviors like borders and scroll bars respectively to any user interface component using the decorator design pattern.

B. Tech. CSE VI SEMESTER

C# AND .NET FRAMEWORK LAB
(Common to CSE & IT)

Course Code: **A1523**

L	T	P	C
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LIST OF EXPERIMENTS:

1. **Working with callbacks and delegates in C#:** Demonstrates the use of delegates, callbacks, and synchronous and asynchronous method invocation, including how Microsoft .NET Framework classes provide explicit asynchronous support using the BeginXXXX and EndXXXX naming conventions and how you can make use of this support in your own code.

2. **Code access security with C#:** Demonstrates the use of .NET Framework Code Access Security, in which code can have permissions independent of the person executing the code.

3. **Creating a COM+ component with C#:** Demonstrates how to create a COM+ component, that takes advantage of Transaction management service within COM+, then assign a strong name to the assembly, register the assembly in the Global Assembly Cache, and register the component with COM+.

4. **Creating a Windows Service with C#:** Demonstrates how to create a Microsoft Windows Service that uses a File System Watcher object to monitor a specific directory for changes in files.

5. **Read and Write Images to a SQL Server Database with C#:** Demonstrates how to upload images into SQL Server by using standard HTML upload methods and then insert each image as a byte array into SQL Server.

6. **Interacting with a Windows Service with C#:** Develop a sample application that launches a Windows Form to allow the user to interact and manipulate the IIS Admin service on the local machine. The application should work by placing an icon in the System Tray.

7. **Partitioning an Application into Multiple Assemblies with C#:** Understand why it can be beneficial to create separate modules for an application download, and then demonstrates how to do so with C#.

8. **Using System Printing in C# Applications:** Develop a sample application that shows how to print a formatted report from sample data stored in an XML file using the PrintDocument class in the System.Drawing.Printing namespace. Also illustrates the user selection of a destination printer and multiple print fonts.

9. **Using Reflection in C#:** Demonstrate how to gather information on various types included in any assembly by using the System.Reflection namespace and some main .NET base classes.

10. **Sending Mail with SmtpMail and C#:** Uses a simple Web form to demonstrate how to use the SmtpMail class in the .NET Framework.

11. **Perform String Manipulation with the String Builder and String Classes and C#:** Demonstrates some basic string manipulation using both the String Builder and String classes.

12. **Application Configuration Using Configuration Files and the Registry Using C#:** A sample application that demonstrates methods of storing application settings by making use of both the system registry and application configuration files. Implements a custom configuration section to show how you can tailor these files to the specific needs of a particular application.

13. **Using the System.Net.WebClient to Retrieve or Upload Data with C#:** Demonstrate how to create a Windows Form that can use HTTP to download and save a resource from a specified URI, upload a resource to a specified URI, or read and write data through a stream object.

14. **Web Services Security with C#:** Examines how to use IIS to perform user authentication so that no changes to the Web Service are required in order to provide superior security.

15. **Reading and Writing XML Documents with the XmlTextReader and XmlTextWriter Class and C#:** Demonstrate how to retrieve information from an existing XML document and how to create a new XML document.

SYLLABI FOR VII SEMESTER

B. Tech. CSE VII SEMESTER

WIRELESS AND MOBILE COMPUTING

Course Code: **A1605**

L	T	P	C
4	-	-	4

UNIT - I

SATIELLITE SYSTEM: History, Applications, Routing, Localization, Handover.

WIRELESS LAN: Infrared vs. radio transmission, infrastructure and ad hoc networks, IEEE 802.11.

HIPER LAN: Protocol architecture, physical layer, channel access control sub-layer, MAC sub-layer, information bases and networking.

UNIT - II

MOBILE COMPUTING: Introduction, history, architecture, devices and applications, limitations.

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS (GSM): Mobile services, system architecture, radio interface, protocols, localization and calling, handover, security, and new data services.

MEDIUM ACCESS CONTROL: Motivation for a specialized MAC (Hidden and exposed terminals, near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - III

MOBILE NETWORK LAYER: Mobile IP (goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, Rrk egistration, tunneling and encapsulation, optimizations), dynamic host configuration protocol (DHCP).

MOBILE ADHOC NETWORKS (MANETS): Overview, properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

MOBILE TRANSPORT LAYER: Traditional TCP, indirect TCP, snooping TCP, mobile TCP, fast retransmit/ fast recovery, transmission /time-out freezing, selective retransmission, transaction oriented TCP.

UNIT - IV

DATA DISSEMINATION: Push based mechanisms, pull based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

DATABASE ISSUES: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues.

UNIT - V

PROTOCOLS AND TOOLS: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (user scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS:

1. Jochen Schiller (2004), *Mobile Communications*, 2nd edition, Low price edition, Pearson Education, New Delhi.
2. Rajkamal (2007), *Mobile Computing*, 2nd edition, Oxford University Press, USA.

REFERENCE BOOKS:

1. Stojmenovic, Cacute(2002), *Handbook of Wireless Networks and Mobile Computing,* John Wiley, New York.
2. Hansmann, Merk, Nicklous, Stober(2003), *Principles of Mobile Computing*, 2nd edition, Springer, New Delhi, India.

B. Tech. CSE VII SEMESTER

SOFTWARE PROJECT MANAGEMENT
(Common to CSE & IT)

Course Code: **A1524**

L	T	P	C
4	-	-	4

UNIT - I

SOFTWARE EFFORTS ESTIMATION TECHNIQUES: The waterfall model, conventional software Management performance. Evolution of software economics **-**Software Economics, pragmatic software cost estimation.

IMPROVING SOFTWARE ECONOMICS: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections, the principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

UNIT - II

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.

MODEL BASED SOFTWARE ARCHITECTURES: A Management perspective and technical perspective. Workflows of the process - Software process workflows, Iteration workflows.

PROJECT ORGANIZATIONS AND RESPONSIBILITIES: Line of Business Organizations, Project Organizations, evolution of Organizations. Process automation - Automation Building blocks, The Project Environment.

UNIT - III

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

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

NEXT GENERATION SOFTWARE ECONOMICS: Modern Project Profiles, Next generation Software economics, modern process transitions.

CASE STUDIES: The Command Center Processing and Display system- Replacement (CCPDS-R), Process Improvement and Mapping to the CMM.

TEXT BOOKS:

1. Walker Royce (2005), *Software Project Management*, Pearson Education, India

REFERENCE BOOKS:

1. Bob Hughes, Mike Cottrell (2006), *Software Project Management*, Tata McGraw-Hill Edition, India.
2. Joel Henry (2003), *Software Project Management,* Pearson Education, India.

B. Tech. CSE VII SEMESTER

SOFTWARE TESTING AND QUALITY ASSURANCE
(Common to CSE & IT)

Course Code: **A1525**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION AND THE TAXONOMY OF BUGS: Purpose of testing, some dichotomies, a model for testing, the consequences of bugs, taxonomy for bugs, some bug statistics.

FLOW GRAPHS AND PATH TESTING: Path testing basics, predicates, path predicates and achievable paths, path sensitizing, path instrumentation, implement and application of path testing.

UNIT - II

TRANSACTION FLOW TESTING AND DATA FLOW TESTING: Transaction flows, transaction flow testing techniques, dataflow testing basics, data flow testing strategies, application, tools and effectiveness.

DOMAIN TESTING: Domains and paths, nice and ugly domains, domain testing, domains and interfaces testing, domains and testability.

UNIT - III

PATHS, PATH PRODUCTS AND REGULAR EXPRESSIONS: Path products and path expressions, a reduction procedure, applications, regular expressions and flow anomaly detection.

LOGIC BASED TESTING: Motivational overview, decision tables, path expressions again, KV charts, specifications.

UNIT - IV

STATES, STATE GRAPHS AND TRANSITION TESTING: State graphs, good state graphs and bad, state testing, testability tips.

GRAPH MATRICES AND APPLICATIONS: Motivational overview, the matrix of a graph, relations, the powers of a matrix, node reduction algorithm, building tools.

UNIT - V

AN OVERVIEW OF SOFTWARE TESTING TOOLS: Overview of win runner and QTP testing tools for functional / regression testing, testing an application using win runner and QTP, synchronization of test cases, data driven testing, testing a web application.

TEXT BOOKS:

1. Boris Beizer (2004), *Software Testing Techniques*, 2nd edition, Dreamtech Press, New Delhi, India.
2. Dr. K. V. K. K. Prasad (2005), *Software Testing Tools*, Dreamtech Press, India.

REFERENCE BOOKS:

1. William E. Perry (2006), *Effective methods of Software Testing*, 3rd edition, John Wiley Edition, USA.
2. Meyers (2004), *Art of Software Testing*, 2nd edition, John Wiley, New Jersey, USA.

B. Tech. CSE VII SEMESTER

DATA MINING AND DATA WAREHOUSING

Course Code: **A1526**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO DATA MINING: Motivation, Importance, Definition of Data Mining, Kind of Data, Data Mining Functionalities, Kinds of Patterns, Classification of Data Mining Systems, Data Mining Task Primitives, Integration of A Data Mining System With A Database or Data Warehouse System, Major Issues In Data Mining, Types of Data Sets and Attribute Values, Basic Statistical Descriptions of Data, Data Visualization, Measuring Data Similarity.

PREPROCESSING: Data Quality, Major Tasks in Data Preprocessing, Data Reduction, Data Transformation and Data Discretization, Data Cleaning and Data Integration.

UNIT - II

DATA WAREHOUSING AND ON-LINE ANALYTICAL PROCESSING: Data Warehouse basic concepts, Data Warehouse Modeling - Data Cube and OLAP, Data Warehouse Design and Usage, Data Warehouse Implementation, Data Generalization by Attribute-Oriented Induction.

DATA CUBE TECHNOLOGY: Efficient Methods for Data Cube Computation, Exploration and Discovery in Multidimensional Databases.

UNIT - III

MINING FREQUENT PATTERNS, ASSOCIATIONS AND CORRELATIONS: Basic Concepts, Efficient and Scalable Frequent Itemset Mining Methods, Are All the Pattern Interesting, Pattern Evaluation Methods, Applications of frequent pattern and associations.

FREQUENT PATTERN AND ASSOCIATION MINING: A Road Map, Mining Various Kinds of Association Rules, Constraint-Based Frequent Pattern Mining, Extended Applications of Frequent Patterns.

UNIT - IV

CLASSIFICATION: Basic Concepts, Decision Tree Induction, Bayesian Classification Methods, Rule-Based Classification, Model Evaluation and Selection, Techniques to Improve Classification Accuracy: Ensemble Methods, Handling Different Kinds of Cases in Classification, Bayesian Belief Networks, Classification by Neural Networks, Support Vector Machines, Pattern-Based Classification, Lazy Learners (or Learning from Your Neighbors), Other Classification Methods.

UNIT - V

CLUSTER ANALYSIS: Basic Concepts of Cluster Analysis, Clustering structures, Major Clustering Approaches, Partitioning Methods, Hierarchical Methods, Density-Based Methods, Model-Based Clustering - The Expectation-Maximization Method, Other Clustering Techniques, Clustering High-Dimensional Data, Constraint-Based and User-Guided Cluster Analysis, Link-Based Cluster Analysis, Semi-Supervised Clustering and Classification, Bi-Clustering, Collaborative Clustering.

OUTLIER ANALYSIS: Why outlier analysis, Identifying and handling of outliers, Distribution-Based Outlier Detection: A Statistics-Based Approach, Classification-Based Outlier Detection, Clustering-Based Outlier Detection, Deviation-Based Outlier Detection, Isolation-Based Method: From Isolation Tree to Isolation Forest.

TEXT BOOKS:

1. Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining: Concepts and Techniques*, 3rd edition, Elsevier, United States of America.

REFERENCE BOOKS:

1. Margaret H Dunham (2006), *Data Mining Introductory and Advanced Topics*, 2nd edition, Pearson Education, New Delhi, India.
2. Amitesh Sinha(2007), *Data Warehousing*, Thomson Learning, India.
3. Xingdong Wu, Vipin Kumar (2009), *The Top Ten Algorithms in Data Mining*, CRC Press, UK.
4. Max Barmer(2007), *Principles of Data Mining*, Springer, USA.

B. Tech. CSE VII SEMESTER

IMAGE PROCESSING
(Interdepartmental Elective - II)

Course Code: **A1610**

L	T	P	C
4	-	-	4

UNIT - I

FUNDAMENTALS OF IMAGE PROCESSING: Image acquisition, image model, sampling, quantization, relationship between pixels, distance measures, connectivity, image geometry, photographic film.

IMAGE TRANSFORMS: A detail discussion on Fourier transform, DFT, FFT, properties. A brief discussion on WALSH transform, WFT, HADAMARD transform, DCT.

UNIT - II

IMAGE ENHANCEMENT (by SPATIAL Domain Methods): Histogram Processing - definition, equalization, matching, local enhancement, use of histogram statics for image enhancement, Arithmetic and logical operations, pixel or point operations, size operations, Smoothing filters-mean, median, mode filters, sharpening spatial filtering.

IMAGE ENHANCEMENT (by FREQUENCY Domain Methods): Design of low pass, high pass, edge enhancement, smoothening filters in frequency domain. Butter worth filter, sharpening frequency domain filters, homomorphic filters in frequency domain.

UNIT - III

IMAGE COMPRESSION: Fundamentals, image compression models, elements of information theory, error-free compression, lossy compression, image compression standards.

UNIT - IV

IMAGE SEGMENTATION: Detection of discontinuities, edge linking and boundary detection, thresholding, region based segmentation, segmentation by morphological watersherds, the use of motion in segmentation.

UNIT - V

COLOR IMAGE PROCESSING: Fundamentals, models, pseudo color image, color transformation, smoothing, color segmentation, noise in color image, color image compression.

MORPHOLOGY: Dilation, erosion, opening, closing, hit-and-miss transform, boundary extraction, region filling, connected components, thinning, thickening, skeletons, pruning extensions to gray scale image application of morphology in image processing.

TEXT BOOKS:

1. Rafael C. Gonzalez, Richard E. Woods (2008), *Digital Image Processing*, Low Price Edition, Pearson Education, New Delhi, India.

REFERENCE BOOKS:

1. Arthur R. Weeks (1996), *Fundamentals of Electronic Image Processing*, Prentice Hall of India, New Delhi.
2. Milan Sonka, Vaclav Hlavac, Roger Boyle (2008), *Image processing, Analysis and Machine vision*, Thomson Publications, India.

B. Tech. CSE VII SEMESTER

POWER ELECTRONICS
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1222**

L	T	P	C
4	-	-	4

UNIT - I

POWER SEMI CONDUCTOR DEVICES AND COMMUTATION CIRCUITS: Thyristors - silicon controlled rectifiers (SCR's), BJT, power MOSFET, power IGBT and their characteristics, other thyristors. Basic theory of operation of SCR, static characteristics, turn on and turn off methods, dynamic characteristics of SCR, turn on and turn off times, salient points, two transistor analogy, SCR UJT firing circuit, series and parallel connections of SCR's, snubber circuit details, specifications and ratings of SCR's, BJT, IGBT numerical problems, line commutation and forced commutation circuits.

UNIT - II

SINGLE PHASE CONTROLLED CONVERTERS: Phase control technique, single phase line commutated converters, midpoint and bridge connections, half controlled converters, fully controlled converters with resistive, RL loads and RLE load, derivation of average load voltage and current line commutated inverters, active and reactive power inputs to the converters without and with freewheeling diode. Effect of source inductance, derivation of load voltage and current, numerical problems.

UNIT - III

THREE PHASE LINE COMMUTATED CONVERTERS: Three phase converters, three pulse and six pulse converters, midpoint and bridge connections average load voltage with R and RL loads, effect of source inductance, dual converters (both single phase and three phase), waveforms, numerical problems.

AC VOLTAGE CONTROLLERS: AC voltage controllers, single phase two SCR's in anti parallel with R and RL loads, modes of operation of Triac, Triac with R and RL loads, derivation of RMS load voltage, current and power factor wave forms, firing circuits, numerical problems.

UNIT - IV

CYCLO CONVERTERS: Cyclo converters, single phase midpoint cyclo converters with resistive and inductive load (principle of operation only), bridge configuration of single phase cyclo converter (principle of operation only), waveforms.

CHOPPERS: Time ratio control and current limit control strategies, step down choppers derivation of load voltage and currents with R, RL and RLE loads, step up chopper, load voltage expression. Morgan's chopper, jones chopper and oscillation chopper (principle of operation only) waveforms, AC chopper, problems.

UNIT - V

INVERTERS: Inverters, single phase inverter, basic series inverter, basic parallel capacitor inverter bridge inverter, waveforms, simple forced commutation circuits for bridge inverters, MC Murray and MC Murray, bedford inverters, voltage control techniques for inverters pulse width modulation techniques, numerical problems.

TEXT BOOKS:

1. M. D. Singh, K. B. Kanchandhani (2008), *Power Electronics*, 3rd edition, Tata Mc graw hill publishing company, New Delhi.
2. M. H. Rashid (1998), *Power Electronics: Circuits, Devices and Applications*, 3rd edition, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. Vedam Subramanyam (1997), *Power Electronics*, New Age International (P) Limited, New Delhi.
2. V. R. Murthy (2005), *Power Electronics,* 1st edition, Oxford University Press, New Delhi.
3. P. C. Sen(2001), *Power Electronics*, 30th edition, Tata Mc Graw Hill Publishing, New Delhi.

B. Tech. CSE VII SEMESTER

VLSI DESIGN
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1429**

L	T	P	C
4	-	-	4

UNIT - I

MOS TRANSISTOR THEORY: Introduction, MOS Device Design Equations–Threshold Voltage-Body Effect, Channel Length Modulation, MOS Models, the Complementary CMOS Inverter-DC characteristics, the differential inverter, the Tristate inverter, Bipolar devices.

UNIT - II

CMOS PROCESSING TECHNOLOGY: Overview-Wafer Processing, Oxidation, Epitaxy, deposition, ion-implantation and diffusion, the silicon gate process, Basic CMOS technology, Latchup – Origin of Latchup, Latchup triggering, Latchup prevention.

UNIT - III

MOS-CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams-nMOS Design style, CMOS design style, Design Rules and Layout-Lambda based design rules, contact cuts, double metal MOS process rules, CMOS Lambda based design rules, general observations on design rules, 2 µm Double metal Double poly CMOS rules, Layout Diagrams.

CIRCUIT CHARACTERIZATION: Introduction, Resistance Estimation, Capacitance Estimation, Inductance, Switching Characteristics-analytic delay models, Power Dissipation, Scaling of MOS Transistor Dimensions.

UNIT - IV

CMOS CIRCUIT DESIGN AND LOGIC DESIGN: Introduction, CMOS logic gate design, Basic Physical design of simple logic gates, CMOS logic structures-CMOS complementary logic, Pseudo-nMOS logic, Dynamic CMOS logic, Pass transistor Logic, CMOS Domino Logic.

UNIT - V

CMOS TESTING: Need for Testing, Manufacturing Test Principles-fault models, Observability, Controllability, Design Strategies for Test, Chip Level test Techniques.

TEXT BOOKS:

1. Neil H. E. Weste, Kamran Eshraghian (2001), *Principles of CMOS VLSI Design – A System Perspective*, 2nd Edition, Pearson Education Asia, India.
2. Kamran Eshraghian, Dougles A. Pucknell, Sholeh Eshraghian (2005)*, Essentials of VLSI Circuits and Systems*, PHI, New Delhi.

REFERENCE BOOKS:

1. John .P. Uyemura (2011), *Introduction to VLSI Circuits and Systems,* John Wiley, India.
2. S.M. Sze (2003), *VLSI Technology,* 2nd Edition, Tata McGraw Hill, New Delhi.

B. Tech. CSE VII SEMESTER

ROBOTICS
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1337**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION: Automation and Robotics, CAD/CAM and Robotics, an over view of Robotics, present and future applications – classification by coordinate system and control system.

COMPONENTS OF THE INDUSTRIAL ROBOTICS: Function line diagram representation of robot arms, common types of arms. Components, Architecture, number of degrees of freedom – Requirements and challenges of end effectors, determination of the end effectors, comparison of Electric, Hydraulic and Pneumatic types of locomotion devices.

UNIT - II

MOTION ANALYSIS: Homogeneous transformations as applicable to rotation and translation, problems.

MANIPULATOR KINEMATICS: Specifications of matrices, D-H notation joint coordinates and world coordinates Forward and inverse kinematics, problems.

UNIT - III

MANIPULATOR DYNAMICS - I: Differential transformation and manipulators, Jacobians, problems. Dynamics: Lagrange, Euler and Newton, Euler formations, Problems.

MANIPULATOR DYNAMICS - II: Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint integrated motion, straight line motion, Robot programming, languages and software packages.

UNIT - IV

ROBOT ACTUATORS AND FEEDBACK COMPONENTS: Actuators: Pneumatic, Hydraulic actuators, electric & stepper motors. Feedback components: position sensors, potentiometers, resolvers, encoders, Velocity sensors.

UNIT - V

ROBOT APPLICATION IN MANUFACTURING: Material Transfer, Material handling, loading and unloading, Processing spot and continuous arc welding & spray painting, Assembly and Inspection.

TEXT BOOKS:

1. M. P. Groover (2010), *Industrial Robotics*, 3rd edition, Pearson Education, New Delhi.
2. K.S. Fu (2010), *Robotics*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.

REFERENCE BOOKS:

1. R.K. Mittal, I. J. Nagrath (2012), *Robotics and Control*, 1st edition, Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
2. P. Coiffet, M. Chaironze (2010), *An Introduction to Robot Technology*, 3rd edition, Kogam Page Ltd., London.
3. Richard D. Klafter(2010), *Robotic Engineering*, 2nd edition, Prentice Hall of India, New Delhi.

B. Tech. CSE VII SEMESTER

AIR POLLUTION AND CONTROL METHODOLOGIES
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1148**

L	T	P	C
4	-	-	4

UNIT - I

AIR POLLUTION: Definitions, scope, significance and episodes, air pollutants – classifications - natural and artificial - primary and secondary, point and non- point, line and areal sources of air pollution- stationary and mobile sources. Effects of air pollutants on man, material and vegetation: global effects of air pollution - green house effect, heat islands, acid rains, ozone holes etc.

UNIT - II

THERMODYNAMICS AND KINETICS OF AIR - POLLUTION: Applications in the removal of gases like SOx, NOx, CO, HC etc., air-fuel ratio. Computation and Control of products of combustion. Meteorology and plume Dispersion,

UNIT - III

PROPERTIES OF ATMOSPHERE: Heat, Pressure, Wind forces, Moisture and relative Humidity, Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

LAPSE RATES: Pressure Systems, Winds and moisture plume behavior and plume Rise Models; Gaussian Model for Plume Dispersion.

UNIT - IV

CONTROL OF PARTICULATES: Control at Sources, Process Changes, Equipment modifications, Design and operation of control. Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators. General Methods of Control of NOx and Sox emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.

UNIT - V

AIR QUALITY MANAGEMENT: Monitoring of SPM, SO; NO and CO Emission Standards.

TEXT BOOKS:

1. M. N. Rao, H. V. N. Rao (1988), *Air pollution*, Tata McGraw Hill Education, New Delhi, India.
2. C. S. Rao (2006), *Environmental Pollution control Engineering*, New age international, New Delhi, India.

REFERENCE BOOKS:

1. R. K. Trivedy, P.K. Goel (2003), *Introduction to Air pollution*, ABD Publications, New Delhi, India.
2. Wark, Warner (1998), *Air pollution its origin and control,* Addison-Wesley, New York.

B. Tech. CSE VII SEMESTER

INTRODUCTION TO AIRCRAFT INDUSTRY
Interdepartmental Elective - II
(Common to CSE & IT)

Course Code: **A1701**

L	T	P	C
4	-	-	4

This Course is Designed in Collaboration with Insfosys Technologies Limited.

UNIT - I

AIRCRAFT INDUSTRY OVERVIEW: Evolution and History of Flight, Types Of Aerospace Industry, Introduction to ages of engineering, Aerospace Manufacturing, Introduction to the space environment & human space exploration.

UNIT - II

INTRODUCTION TO AIRCRAFTS, DURATION: Basic components of an Aircraft, Structural members, Aircraft Axis System, Aircraft Motions, Control surfaces and High lift Device. Types of Aircrafts - Lighter than Air/Heavier than Air Aircrafts Conventional Design Configurations based on Power Plant Location, Wing vertical location, intake location, Tail Unit Arrangements, Landing Gear Arrangements. Unconventional Configurations-Biplane, Variable Sweep, Canard Layout, Twin Boom Layouts, Span loaders, Blended Body Wing Layout, STOL and STOVL Aircraft, Stealth Aircraft. Advantages and disadvantages of these Configurations.

UNIT - III

INTRODUCTION TO AIRCRAFT SYSTEMs: Types of Aircraft Systems, Mechanical Systems, Electrical and Electronic Systems, Auxiliary systems. ***Mechanical Systems***: Environmental control systems (ECS), Pneumatic systems, Hydraulic systems, Fuel systems, Landing gear systems, Engine Control Systems, Ice and rain protection systems, Cabin Pressurization and Air Conditioning Systems, Steering and Brakes Systems Auxiliary Power Unit. ***Electrical systems:*** Avionics, Flight controls, Autopilot and Flight Management Systems, Navigation Systems, Communication, Information systems, Radar System.

UNIT - IV

BASIC PRINCIPLES OF FLIGHT: Significance of speed of Sound, Air speed and Ground Speed, Properties of Atmosphere, Bernoulli's Equation, Forces on the airplane, Airflow over wing section, Pressure Distribution over a wing section, Generation of Lift, Drag, Pitching moments, Types of Drag, Lift curve, Drag Curve, Lift/Drag Ratio Curve, Factors affecting Lift and Drag, Center of Pressure and its effects. Aerofoil Nomenclature, Types of Aerofoil, Wing Section- Aerodynamic Center, Aspect Ratio, Effects of lift, Drag, speed, Air density on drag.

UNIT - V

BASICS OF FLIGHT MECHANICS: Mach Waves, Mach Angles, Sonic and Supersonic Flight and its effects.

STABILITY AND CONTROL: Degree of Stability- Lateral, Longitudinal and Directional Stability and controls of Aircraft. Effects of Flaps and Slats on Lift Coefficients, Control Tabs, Stalling, Landing, Gliding Turning, Speed of Sound, Mach Numbers and Shock Waves.

AIRCRAFT PERFORMANCE AND MANEUVERS: Power Curves, Maximum and minimum speeds of horizontal flight, Effects of Changes of Engine Power, Effects of Altitude on Power Curves, Forces acting on a Aeroplane during a Turn, Loads during a Turn, Correct and incorrect Angles of Bank, Aerobatics, Inverted Maneuvers, Maneuverability

TEXT BOOKS:

1. Anderson J. D. (2012), *Introduction to Flight*, 7th edition, McGraw Hill, New Delhi.
2. Shevell (2004), *Fundamentals of Flight*, 2nd edition, Pearson Education Limited, India.
3. Allan Seabridge, Ian Moir (2008), *Aircraft Systems: Mechanical, Electrical and Avionics Subsystems Integration,* 3rd edition, John Willey & Sons, New Delhi, India.

REFERENCES BOOKS:

1. A.C Kermode (2012), *Mechanics of Flight*, 12th edition, Pearson Education Limited, India.
2. Kermode, A.C. (1989), *Flight without Formulae*, 5th edition, Pearson Education Limited, India.

B. Tech. CSE VII SEMESTER

OPERATIONS RESEARCH
Professional Elective - I
(Common to CSE, IT, ME & ECE)

Course Code: **A1331**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO OPERATIONS RESEARCH: Basics definition, scope, objectives, phases, models and limitations of Operations Research. Linear Programming Problem, Formulation and Graphical solution of Linear Programming Problem. Simplex Method, Artificial variables Techniques, big -M method, two -phase simplex method, degeneracy and unbound solutions.

UNIT - II

TRANSPORTATION PROBLEM: Formulation, solution, unbalanced Transportation problem. Finding basic feasible solutions, North-West corner rule, least cost method and Vogel's approximation method. Optimality test - MODI method.

ASSIGNMENT MODEL: Formulation, Hungarian method for optimal solution, solving unbalanced problem, Traveling salesman problem as assignment problem.

UNIT - III

SEQUENCING MODELS: Solution of Sequencing Problem, Processing n Jobs through two machines, Processing n Jobs through three machines, Processing two Jobs through m machines, Processing n Jobs through m Machines.

QUEUING THEORY: Introduction, Single Channel, Poisson arrivals, exponential service times with infinite population and finite population models.

UNIT - IV

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

INVENTORY MODELS: Inventory costs, Models with deterministic demand model: (a) Demand rate uniform and production rate infinite, (b) Demand rate non-uniform and production rate infinite, (c) Demand rate uniform and production rate finite.

UNIT - V

GAME THEORY: Competitive game, rectangular game, saddle point, minimax (maximin) method of optimal strategies, value of the game. Solution of games with saddle points, dominance principle, Rectangular games without saddle point, mixed strategy for 2 X 2 games.

DYNAMIC PROGRAMMING: Characteristics of dynamic programming, Dynamic programming approach for priority management employment smoothening, Capital budgeting, Stage Coach/Shortest Path, cargo loading and Reliability problems.

TEXT BOOKS:

1. A. M. Natarajan, P. Balasubramani, A. Tamilarasi (2006), *Operations Research*, Pearson Education, India.
2. S. D. Shama (2009), *Operation Research,* Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. J. K. Sharma (2007), *Operations Research – Theory and Applications,* 3rd edition, Macmillan India Ltd, India.
2. R. Panneerselvam (2008), *Operations Research*, 2nd edition, Prentice Hall of India, India.
3. F. S. Hillier, G. J. Lieberman (2007), *Introduction to Operations Research,* 8th edition, Tata McGraw Hill, New Delhi, India.

B. Tech. CSE VII SEMESTER

BUILDING ENTERIPSE APPLICATIONS
Professional Elective - I
(Common to CSE & IT)

Course Code: **A1608**

L	T	P	C
3	1	-	4

This Course is designed in Collaboration with Infosys Technologies Limited.

UNIT - I

INTRODUCTION: Introduction to Enterprise Applications and their types, Software Engineering Methodologies, Life cycle of raising Enterprise Application, Introduction to skills required to build an Enterprise Application, Key determinants of successful Enterprise Applications, and measuring the success of Enterprise Application.

UNIT - II

INCEPTING ENTERPRISE APPLICATIONS: Enterprise Analysis, Business Modeling, Requirements Elicitation, Actors and Use Cases Modeling, Prototyping, Non Functional Requirements, Requirements Validation, Planning and Estimation.

UNIT - III

ARCHITECTING AND DESIGNING ENTERPRISE APPLICATION: Concept of Architecture, Views and Viewpoints, Enterprise Architecture, Logical Architecture, Technical Architecture – Design, different Technical Layers, Best Practices, Data Architecture and Design – Relational, XML, and other Structured Data Representations, Infrastructure Architecture and Design Elements – Networking, Internetworking, and Communication Protocols, IT Hardware and Software, Middleware, Policies for Infrastructure Management, Deployment Strategy, Documentation of Application Architecture and Design.

UNIT - IV

CONSRUCTING ENTERPRISE APPLICATIONS: Construction readiness of Enterprise Applications – defining a Construction Plan, defining a Package Structure, Setting up a Configuration Management Plan, Setting up a Development Environment, Introduction to the concept of Software Construction Maps, Construction of Technical Solutions Layers, Methodologies of Code Review, Static Code Analysis, Build Process and Unit Testing, Dynamic Code Analysis – Code Profiling and Code Coverage.

UNIT - V

TESTING ROLLING OUT ENTERPRISE APPLICATIONS: Type and methods of testing an Enterprise Application, Testing Levels and Approaches, Enterprise Application Environments, Integration Testing, Performance Testing, Penetration Testing, Usability Testing, Globalization Testing and Interface Testing, User Acceptance Testing, Rolling out an Enterprise Application.

TEXT BOOKS:

1. Anubhav Pradhan, SathReesha B. Nanjappa, Senthil K. Nallasamy, VeeraKumar Esakimuthu(2010), *Raising Enterprise Applications: A Software Engineering Perspective*, Wiley India Pvt Ltd, India.

REFERENCE BOOKS:

1. Raffaele Garofalo(2011), *Building Enterprise Applications with Windows® Presentation Foundation and the Model View View Model Pattern*, O'Reilly Media, Inc, India.

B. Tech. CSE VII SEMESTER

BIOINFORMATICS
Professional Elective - I
(Common to CSE & IT)

Course Code: **A1609**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO BIOINFORMATICS: Scope of bioinformatics, elementary commands and protocols, FTP, Telnet, HTTP, primer on information theory.

INTRODUCTION TO HOMOLOGY: Introduction to homology (with special mention to Charles Darwin, Sir Richard Owen, Willie Henning, Alfred Russel Wallace).

UNIT - II

SPECIAL TOPICS IN BIOINFORMATICS: DNA mapping and sequencing, Map alignment, large scale sequencing methods, Shotgun and Sanger method.

UNIT - III

SEQUENCE ALIGNMENT AND DYNAMIC PROGRAMMING: Heuristic alignment algorithms, Global sequence alignments- Needleman-Wunsch algorithm, Smith-Waterman algorithm - local sequence alignments, Amino acid substitution matrices- PAM and BLOSUM.

UNIT - IV

PRIMARY DATABASE AND THEIR USE: Introduction to biological databases, organization and management of databases, Searching and retrieval of information from the World Wide Web, Structure databases - PDB (Protein Data Bank), Molecular Modeling Databases (MMDB), primary databases- NCBI, EMBL, DDBJ.

SECONDARY DATABASES: Introduction to secondary databases- organization and management of databases Swissprot, PIR, KEGG.

UNIT - V

BIOCHEMICAL DATA BASES: Introduction to biochemical databases, organization and management of databases, KEGG, EXGESCY, BRENDA, WIT.

TEXT BOOKS:

1. Hooman H. Rashidi, Lukas K. Buehler (2005), *Bioinformatics Basics, Applications in Biological Science and Medicine*, 2nd edition, CRC Press, Taylor and Francis Group, USA.
2. David W. Mount (2005), *Bioinformatics- Sequence and Genome Analysis*, 2nd edition, Cold Spring Harbor Laboratory Press, New York.

REFERENCE BOOKS:

1. Harshawardhan P. Bal (2005), *Bioinformatics Principles and Applications,* Tata McGraw Hill, New Delhi.
2. Cynthia Gibbas, Per Jamberk(2001), *Developing Bioinformatics Skills,* Cold Spring Harbor Laboratory Press, New York.
3. C. Stan Tsai (2002), *An Introduction to Computational Biochemistry*, John Wiley & Sons Inc, New York.

B. Tech. CSE VII SEMESTER

RATIONAL APPLICATION DEVELOPER
Professional Elective – I
(Common to CSE & IT)

Course Code: **A1527**

L	T	P	C
3	1	-	4

This Course is designed in Collaboration with IBM India Private Limited.

UNIT - I

WORKBENCH BASICS: Set Workbench preferences, Work with perspectives and views, Use the import and export wizards, Use the Help feature to aid in development activities, Use the Local History to compare and replace resources, Manage workspaces.

JAVA DEVELOPMENT: Create Java projects packages, classes, and methods, Manage the Java Build Path, Use the Outline view, Use the refactoring features, Use the Java editor features such as content assist and code formatting, Add and organize import declarations, Use the Java search function, Use the Task and Problems views, Use the Hierarchy view, Use the resource and project property dialogues.

UNIT - II

WEB DEVELOPMENT BASICS: Create dynamic and static Web projects, Understand classpath and module dependencies, Use Page Designer to add and modify HTML, JavaScript, and JSP content, Configure Web project properties, Create and configure Servlets.

UNIT - III

RUNNING APPLICATIONS: Use WebSphere Application Server V6 to run J2EE applications, Create and configure data sources, Add and remove projects from the server, Run stand-alone Java applications, Locate and view WebSphere application server logs.

DATABASES: Create a database connection, use the SQL Statement wizard, sample contents of a database table.

UNIT - IV

WEB DEVELOPMENT - ADVANCE: Understand the available Struts development tools, understand the available JSF (JavaServer Faces) development tools.

PACKAGING AND DEPLOYMENT: Create J2EE projects, Import and export J2EE modules, Create and locate resources in the appropriate location of the project hierarchy, Work with Web and Application Deployment Descriptor Editors.

UNIT - V

DEBUGGING WEB APPLICATION: Perform JSP debugging, Use step-by-step debugging.

TEST WEB APPLICATION: Perform unit testing using Junit, Perform Web Application testing.

TEXT BOOKS:

1. Ueli Wahli (2010), *Rational Application Developer V7.5 Programming Guide*, 1st edition, Redbooks, SPD, New Delhi, India.

REFERENCE BOOKS:

1. Jane Fung, Christina Lau, Ellen McKay, Valentina Birsan, Colin Yu, Joe Winchester, Dr. Gili Mendel, Gary Flood , Peter Walker, Timothy deBoer, Yen Lu, James Hunter(2005), *An Introduction to IBM Rational Application Developer: A Guided Tour (Ibm Illustrated Guide Series*)**,** Mc Press, IBM Press, USA.
2. Colette Burrus, Stephanie Parkin (2008), *Building Applications with IBM Rational Application Developer and JavaBeans*, 2nd edition, Mc Press, IBM Press, USA.

B. Tech. CSE VII SEMESTER

ADVANCED COMPUTER ARCHITECTURE
(Professional Elective – I)

Course Code: **A1528**

L	T	P	C
3	1	-	4

UNIT - I

PARALLEL COMPUTER MODELS: The State of Computing, Computer development milestones, Elements of modem computers, Evolution of computer architecture, System attributes to performance, Multiprocessors and Multicomputers, Shared -Memory Multiprocessors, Distributed -Memory Multicomputers, A Taxonomy of MIMD Computers, Multivector and SIMD computers, Vector Supercomputers, SIMD Supercomputers, Program and Network Properties, Conditions of Parallelism, Data and Resource Dependences, Hardware and Software Parallelism, The Role of Compilers, Program Partitioning and Scheduling, Grain Sizes and Latency, Grain Packing and Scheduling, Program flow Mechanisms, Control Flow Versus Data Flow , Demand-Driven Mechanisms, Comparisons of Flow Mechanisms.

UNIT - II

SYSTEM INTERCONNECT ARCHITECTURE: Network properties and Routing , Static Connection Networks, Dynamic Connection Networks, Processor and Memory Technologies, Advanced Processor Technology, Instruction Pipelines, Processors and Co-processors, Instruction Set Architectures, CISC Scalar Processor (exclude CISC Microprocessor Families), RISC Scalar Processor (exclude Sun Microsystems SPARC Architecture), Superscalar and Vector Processor, Superscalar Processors (exclude IBM RS/6000 Architecture), VLIW Architecture, Shared-Memory, Organizations, Interleaved Memory Organization, Bandwidth and fault Tolerance, Memory Allocation Schemes (exclude swapping in Unix, Demand Paging system and Hybrid Paging system).

UNIT - III

MEMORY HIERARCHY: Hierarchical Memory Technology, Inclusion, Coherence and Locality, Memory Capacity Planning, Cache Memory Organization, Cache Addressing Models.

BUSES AND ARBITRATION: Hierarchical Bus System, Backplane Bus Specification, Bus Arbitration and Control, Arbitration, Transaction and Interrupt, IEEE Futurebus+ Standards.

UNIT - IV

PIPELINING AND SUPERSCALAR TECHNIQUES: Linear Pipeline Processors, Asynchronous and Synchronous Models, Clocking and Timing control, Speed up, Efficiency and Throughput, Nonlinear Pipeline Processors, Reservation and Latency Analysis, Collision-Free Scheduling, Instruction Pipeline Design, Instruction Execution Phases, Mechanism for Instruction, Pipelining ,Dynamic Instruction Scheduling, Branch Handling Techniques, Arithmetic Pipeline Design, Computer Arithmetic Principles, Static Arithmetic Pipeline, Multifunctional Arithmetic Pipeline (exclude IBM360 Floating Point Unit).

UNIT - V

MULTIPROCESSORS AND MULTI-COMPUTERS: Multiprocessor System Interconnects, Hierarchical Bus Systems: Crossbar Switch and Multiport Memory, Multistage and Combing Networks, Cache Coherence and Synchronization Mechanisms, The Cache Coherence Problem, Snoopy Bus Protocol, Directory-based protocols, Hardware Synchronization Mechanisms, Message Passing Mechanisms, Message Routing Schemes, Deadlock and Virtual Channels, Flow Control Strategy.

TEXT BOOKS:

1. Kai Hwang (2000), *Advanced Computer Architecture- Parallelism, Scalability, Programmability*, The McGraw Hill Companies, New Delhi.

REFERENCE BOOKS:

1. David E. Culler, J. P. Singh, Anoop Gupta, Harcourt Asiam, Morgan Kaufmann (1999), *Parallel Computer Architecture,* Elsevier, India.
2. John P. Hayes (1998), *Computer Architecture and Organization*, 3rd edition, The McGraw Hill Companies, New Delhi, India.
3. V. Rajararnan, C. Siva Ram Murthy (2000), *Parallel Computers - Architecture and Programming*, Prentice Hall of India, New Delhi.

B. Tech. CSE VII SEMESTER

DISTRIBUTED OPERATING SYSTEMS
Professional Elective – I
(Common to CSE & IT)

Course Code: **A1529**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO DISTRIBUTED SYSTEMS: What is a Distributed System, Hardware concepts, software concepts, design issues.

UNIT - II

COMMUNICATION IN DISTRIBUTED SYSTEMS: Layered Protocols, ATM networks, the client / server model, remote procedure call, group communication.

UNIT - III

SYNCHRONIZATION IN DISTRIBUTED SYSTEM: Clock synchronization, mutual exclusion, election algorithms, atomic transactions, deadlocks in distributed systems.

UNIT - IV

PROCESS AND PROCESSORS IN DISTRIBUTED SYSTEM: Threads, system models, processors allocation, scheduling in distributed system, fault tolerance, real time distributed system.

DISTRIBUTED FILE SYSTEMS: Distributed file system design, distributed file system implementation, trends in distributed file system.

UNIT - V

DISTRIBUTED SHARED MEMORY: Introduction to Shared memory, Consistency models, page based distributed shared memory, shared variable distributed shared memory, object based distributed shared memory.

TEXT BOOKS:

1. Andrew S. Tanenbanm (2007), *Distributed Operating Systems,* Pearson Education Inc, India.

REFERENCE BOOKS:

1. Makes Singhal, Niranjan G. Shivaratna (2001), *Advanced Concepts in Operating Systems,* Tata McGraw-Hill Edition, New Delhi, India.

B. Tech. CSE VII SEMESTER

SOFTWARE TESTING AND QUALITY ASSURANCE LAB
(Common to CSE & IT)

Course Code: **A1530**

L	T	P	C
-	-	3	2

LIST OF EXPERIMENTS:

1. Generate meaningful Unit test cases for the Project module-wise and test them for defects, identify the defects from the code and correct them. Try Identify the various unit test metrics studied already to identify module stability. Fill the unit test report supplied by the instructor.

2. Generate meaningful Integration test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various Integration test metrics studied already to identify module stability. Fill the Integration test report supplied by the instructor.

3. Generate meaningful System test cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied by the instructor.

4. Generate meaningful User Acceptance cases for the Project and test them for defects, identify the defects and correct them. Try Identify the various System test metrics studied already to identify system stability. Fill the System test report supplied 0062y the instructor.

5. Test the supplied project/Application through testing tool: Win Runner, by generating appropriate test cases.

6. Test the supplied project/Application through testing tool: Load Runner by generating appropriate test cases.

7. Test the supplied project/Application through testing tool: Quick Test Professional by generating appropriate test cases.

TEXT BOOKS:

1. Dr. K.V.K.K. Prasad (2007), *Software Testing Tools*, Dream tech Press.
2. Boris Beizer(2003), *Software Testing Techniques*, 2nd edition, Dream tech Press.

B. Tech. CSE VII SEMESTER

DATA MINING AND DATA WAREHOUSING LAB

Course Code: **A1531**

L	T	P	C
-	-	3	2

I. DATA MINING LAB:

1. **Associations**

Derive associations manually from the following dataset.

Outlook	Temperature	Humidity	Windy	Play
Sunny	Hot	High	False	No
Sunny	Hot	High	True	No
Overcast	Hot	High	False	Yes
Rainy	Mild	High	False	Yes
Rainy	Cool	Normal	False	Yes
Rainy	Cool	Normal	True	No
Overcast	Cool	Normal	True	Yes
Sunny	Mild	High	False	No
Sunny	Cool	Normal	False	Yes
Rainy	Mild	Normal	False	Yes
Sunny	Mild	Normal	True	Yes
Overcast	Mild	High	True	Yes
Overcast	Hot	Normal	False	Yes
Rainy	Mild	High	True	No

2. **Clustering**

i. Open Weka and Load the data set editor. Get familiarize with the editor operations.
   a. Load the weather. nominal dataset. Use the filter weka. Unsupervised, instance. Remove with Values to remove all instances in which the humidity attribute has the value high. To do this, first make the field next to the Choose button show the text Remove with Values. Then click on it to get the Generic Object Editor window, and figure out how to change the filter settings appropriately.
   b. Undo the change to the dataset that you just performed, and verify that the data has reverted to its original state.

ii. Choosing k-means clustering algorithm for clustering use the Cancer data (.arff) perform clustering with a Euclidean distance function and visually inspect the nature of the clusters.

3. **Classification**

i. Choosing an appropriate filter for classification use the Iris data (.arff) perform classification and visualize the classification tree.

ii. The glass dataset glass.arff from the U.S. Forensic Science Service contains data on six types of glass. Glass is described by its refractive index and the chemical elements that it contains; the aim is to classify different types of glass based on these features. This dataset is taken from the UCI datasets, which have been collected by the University of California at Irvine and are freely available on the Web. They are often used as a benchmark for comparing data mining algorithms. Find the dataset glass.arff and load it into the Explorer interface. For your own information, answer the following exercises. How many attributes are there in the

dataset? What are their names? What is the class attribute? Run the classification algorithm IBk (weka.classifiers.lazy.IBk). Use cross-validation to test its performance.

II. DATA WAREHOUSING LAB:

1. Introduction to Informatica Power Center 7.1.1 and Introduction to Oracle 9i.

2. **Adding a Repository**
   a. Create a Source Definition using source connection and import the employee data from source table.
   b. Organize the columns in the table view to the requirement of Data Analysis.
   c. Create a Target Definition using target connection to the target table.
   d. Create tables for transformation and generate SQL to perform transformation.

3. **Mapping**
   a. Perform an ETL on Employees database. Select the employee table as the source and the same as the target and assume connectivity and delimiters as pipe without any specific transformations.
   b. Perform an ETL on Employees database. Select the employee table as the source and the same as the target and assume connectivity and delimiters as pipe using expression transformation, filter transformation, router transformation, aggregator transformation and joiner transformation.
   c. Perform and ETL on Employees database, connect the source and target and then perform debug on the filter transformation mapping.

4. **Lookup**
   a. Using the above mappings perform connected lookup with lookup transformation using natural keys and populate the other keys with default values.

SYLLABI FOR VIII SEMESTER

B. Tech. CSE VIII SEMESTER

INDUSTRIAL MANAGEMENT AND PSYCHOLOGY
(Common to CSE & IT)

Course Code: **A1015**

L	T	P	C
3	1	-	4

UNIT - I

CONCEPTS OF MANAGEMENT AND ORGANISATION: Functions of management, evolution of management thought, Taylor's scientific management, fayol's principles of management, Hertzberg's Maslow's hierarchy of human needs, systems approach to management.

DESIGNING ORGANISATIONAL STRUCTURES: Basic concepts related to organisation - departmentation and decentralization, types of mechanistic and organic structures of organisation (line organization, line and staff organization, functional organization.

UNIT - II

PLANT LOCATION: Definition, factors affecting the plant location, comparison of rural and urban sites, methods for selection of plant- matrix approach. Plant layout - definition, objectives, types of production, types of plant layout, various data analyzing forms travel chart.

WORK STUDY: Definition, objectives, method study - definition, objectives, steps involved- various types of associated charts, difference between micromotion and memomotion studies. Work measurement- definition, time study, steps involved, equipment, different methods of performance rating, allowances, standard time calculation. Work Sampling - definition, steps involved, standard time calculations, differences with time study.

UNIT - III

INTRODUCTION TO PERT / CPM : Project management, network modeling-probabilistic model, various types of activity times estimation, programme evaluation review techniques, critical path, probability of completing the project, deterministic model, critical path method (CPM), critical path calculation, crashing of simple of networks.

INSPECTION AND QUALITY CONTROL: Types of inspections, statistical quality control, techniques, variables and attributes, assignable and non assignable causes, variable control charts, and R charts, attributes control charts, p charts and c charts. Acceptance sampling plan, single sampling and double sampling plans, OC curves. Introduction to TQM - quality circles, ISO 9000 series procedures.

UNIT - IV

MATERIALS MANAGEMENT: Objectives, inventory functions, types, associated costs, inventory classification techniques-ABC and VED analysis. Inventory control systems, continuous review system, periodical review system. Stores management and stores records. Purchase management, duties of purchase of manager, associated forms.

INTRODUCTION TO HUMAN RESOURCE MANAGEMENT: Functions of HRM, job evaluation, different types of evaluation methods. Job description, merit rating, difference with job evaluation, different methods of merit ratings, wage incentives, different types of wage incentive schemes. Marketing, marketing vs. selling, marketing mix, product life cycle.

UNIT - V

INDUSTRIAL PSYCHOLOGY: Definition and concept, industrial psychology vs. personnel management, aims and objectives of industrial psychology, scope of industrial psychology, individual and group, individual differences in behavior, group dynamics, theory x and y, Hawthorne experiment, morale, motivation, working environmental conditions, industrial fatigue.

TEXT BOOKS:

1. O. P. Khanna (2004), *Industrial Engineering and Management*, Dhanpat Rai, New Delhi.

REFERENCE BOOKS:

1. Stoner, Freeman (2005), *Gilbert, Management*, 6th edition, Pearson Education, New Delhi.
2. Panner Selvam (2004), *Production and Operations Management*, Prentice Hall of India, New Delhi.
3. Ralph M. Barnes (2004), *Motion and Time Studies*, John Wiley and Sons.
4. L. S. Srinath (2000), *PERT / CPM*, affiliate East-West Press, New Delhi.
5. Gary Dessler (2002), *Human Resource Management*, Pearson Education Asia, India.

B. Tech. CSE VIII SEMESTER

GRID AND CLOUD COMPUTING
Professional Elective - II
(Common to CSE & IT)

Course Code: **A1611**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Introduction to middleware technologies and its classification.

DISTRIBUTED SYSTEM MODELS AND ENABLING TECHNOLOGIES: Scalable Computing Service over the Internet, the Age of Internet Computing, Computing Trends and New Paradigms, Internet of Things and Cyber-Physical Systems. System Models for Distributed and Cloud Computing, Clusters of Cooperative Computers, Grid Computing Infrastructures, Peer-to-Peer Network Families, Cloud Computing over the Internet. Software Environments for Distributed Systems and Clouds, Service-Oriented Architecture (SOA), Distributed Operating Systems and Software Tools, Parallel/Distributed Programming Models. ***Performance, Security and Energy-Efficiency:*** Performance Metrics and Scalability Analysis, Fault-Tolerance and System Availability, Network Threats and Data Integrity, Energy-Efficiency in Distributed Computing.

UNIT - II

DESIGN OF CLOUD COMPUTING PLATFORMS: Cloud Computing and Service Models; Public, Private and Hybrid Clouds, Cloud Ecosystem and Enabling Technologies, Infrastructure-as-a-Service (IaaS) Model, Platform -and Software-as-a-Service (Paas, SaaS). ***Architecture Design Of Compute And Storage Clouds:*** A Generic Cloud Architecture Design, Layered Cloud Architectural development, Virtualization Support and Disaster Recovery, Architectural Design Challenges. ***Public Cloud Platforms*****:** Google Application Engine (GAE), Amazon Web Service (AWS) and Windows Azure; Public Clouds and Service Offerings, Google Application Engine (GAE), Amazon Web Service (AWS), Microsoft Windows Azure. ***Inter- Cloud Resource Management:*** Extended Cloud Computing Services, Resource Provisioning and Platform Deployment, Virtual Machine Creation and Management, Global Exchange of Cloud Resources. ***Cloud Security and Trust Management:*** Cloud Security Defense Strategies, Distributed Intrusion/Anomaly Detection, Data and Software Protection Techniques, Reputation-Guided Protection of Datacenters.

UNIT - III

SERVICE ORIENTED ARCHITECTURES: ***Services and Service Oriented Architectures:*** REST and Systems of Systems, Services and Web Services, Enterprise Multi-tier Architecture, Grid Services and OGSA, Other Service Oriented Architectures and Systems. ***Message-Oriented Middleware:*** Enterprise Bus, Publish-Subscribe Model and Notification, Queuing and Messaging Systems, Cloud and Grid Middleware applications. ***Discovery, Registries, Metadata and Databases:*** UDDI and Service Registries, Databases and Publish-Subscribe, Metadata catalogues, Semantic Web and Grid, Job Execution Environments and Monitoring. ***Workflow in Service-Oriented Architectures:*** Basic Concepts of Workflow, Workflow Standards, Workflow Architecture and Specification, Workflow Execution Engine.

UNIT - IV

CLOUD PROGRAMMING AND SOFTWARE ENVIRONMENTS: Features of Cloud and Grid Platforms; Cloud Capabilities and Platform Features, Traditional Features Common to Grids and Clouds, Data Features and Databases, Programming and Runtime Features. Parallel and Distributed Programming Paradigms; Parallel Computing and Programming Paradigms, MapReduce, Twister and Iterative MapReduce, Hadoop Library from Apache, Mapping Applications to Parallel and Distributed Systems. ***Programming Support of Google App Engine:*** Programming the Google App Engine, Google File System (GFS), Bigtable, Google's NOSQL system, Chubby, Google's Distributed Lock service***. Programming on Amazon AWS and Microsoft Azure:*** Programming on Amazon EC2, Amazon Simple Storage Service S3, Amazon Elastic Block Store EBS and SimpleDB, Microsoft Azure programming support.

EMERGING CLOUD SOFTWARE ENVIRONMENTS: Open Source Eucalyptus and Nimbus, OpenNebula, Sector/Sphere and OpenStack, Manjrasoft Aneka Cloud and Appliances.

UNIT - V

GRID COMPUTING SYSTEMS AND RESOURCE MANAGEMENT: Grid Architecture and Service Modeling; Grid History and service families, CPU Scavenging and Virtual super computers, OGSA, Data intensive Grid service models.

GRID RESOURCE MANAGEMENT AND BROKERING: Resource Management and Job Scheduling, Grid Resource Monitoring with CGSP, Service Accounting and Economy Model, Grid Resource Brokering with Gridbus. Software and Grid Computing; Open-Source Grid Middleware Packages, The Globus Toolkit Architecture (GT4), Containers and

Resource/Data Management. Grid Application Trends and security measures; Trust models for grid security enforcement, Authentication and Authorization methods, GSI. On-Line Social and Professional Networking; Online Social Network Characteristics, Graph-Theoretic Analysis of Social networks, Communities and Applications of Social Networks, ***Facebook***: The World's Largest Content-Sharing Network, Twitter for Microblogging, News and Alert Services.

TEXT BOOKS:

1. Kai Hwang, Jack Dongarra, Geoffrey Fox (2011), *Distributed and Cloud Computing, From Parallel Processing to the Internet of Things*, Morgan Kaufman Publishers, India.

REFERENCE BOOKS:

1. Joshy Joseph, Craig Fellenstein(2007), *Grid Computing*, IBM Press, India.
2. Prabhu(2007), *Grid and Cluster Computing*, Prentice Hall of India, New Delhi.
3. Anthony T. Velte, Toby J. Velte, Robert Elsenpeter(2010), *Cloud Computing, A Practical Approach*, McGraw Hill Edition, New Delhi.

B. Tech. CSE VIII SEMESTER

BUSINESS INTELLIGENCE AND ANALYTICS
Professional Elective - II
(Common to CSE & IT)

Course Code: **A1533**

L	T	P	C
3	1	-	4

This Course is designed in collaboration with Infosys Technologies Limited.

UNIT - I

INTRODUCTION TO BUSINESS INTELLIGENCE: Introduction to digital data and its types – structured, semi-structured and unstructured, Introduction to OLTP and OLAP (MOLAP, ROLAP, HOLAP), BI Definitions & Concepts, BI Framework, Data Warehousing concepts and its role.

UNIT - II

ASPECTS OF BUSINESS INTELLIGENCE: BI Infrastructure Components – BI Process, BI Technology, BI Roles & Responsibilities, Business Applications of BI, BI best practices.

UNIT - III

BASICS OF DATA INTEGRATION: Concepts of data integration, needs and advantages of using data integration, introduction to common data integration approaches, Meta data – types and sources, Introduction to data quality, data profiling concepts and applications, introduction to ETL using Pentaho data Integration (formerly Kettle).

UNIT - IV

INTRODUCTION TO MULTI-DIMENSIONAL DATA MODELING: Introduction to data and dimension modeling, multidimensional data model, ER Modeling vs. multi dimensional modeling, concepts of dimensions, facts, cubes, attribute, hierarchies, star and snowflake schema, introduction to business metrics and KPIs, creating cubes using Microsoft Excel.

UNIT - V

BASICS OF ENTERPRISE REPORTING: A typical enterprise, Malcolm Baldrige – quality performance framework, balanced scorecard, enterprise dashboard, balanced scorecard vs. enterprise dashboard, enterprise reporting using MS Access / MS Excel, best practices in the design of enterprise dashboards.

TEXT BOOKS:

1. Daniel J. Power (2002), *Decision Support Systems: Concepts and Resources for Managers*, Greenwood Publishing Group, Inc, USA.
2. Roland Bouman, Jos van Dongen(2009), *Pentaho Solutions - Business Intelligence and Data warehousing With Pentaho and MySQL,* Wiley Publishing, Inc, Indiana.

REFERENCE BOOKS:

1. Jerzy Surma (2011), *Business Intelligence: Making Decisions through Data Analytics,* Business Expert Press, New Delhi, India.
2. William H. Inmon(2005), *Building the Data Warehouse,* 4th edition, Wiley- India Private Limited, New Delhi.
3. Solomon Negash (2004), *Communications of the Association for Information Systems,* Volume13, USA.
4. Jiawei Han, Micheline Kamber, Jian Pei (2012), *Data Mining: Concepts and Techniques*, 3rd edition, Elsevier, United States of America.
5. David Taniar (2009), *Progressive methods* in *Data Warehousing and Business Intelligence: Concepts and Competitive Analytics,* Idea Group Inc (IGI), USA.
6. Rajiv Sabherwal, Irma Becerra-Fernandez (2011), *Business Intelligence: Practices, Technologies and Management,* John Wiley & Sons, USA.

B. Tech. CSE VIII SEMESTER

ARTIFICIAL INTELLIGENCE
(Professional Elective - II)

Course Code: **A1534**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO ARTIFICIAL INTELLIGENCE: Problem and search- what is AI technique, criteria for success, Problem space and search - defining the problem as a state space search, production systems problem characteristics, production system characteristics.

PROBLEM SPACE AND SEARCH: Defining the problem as a state space search, production systems problem characteristics, production system characteristics.

HEURISTIC SEARCH TECHNIQUES: Generate test, Hill Climbing, BFS, Problem Reduction Constraint Satisfaction.

UNIT - II

KNOWLEDGE REPRESENTATION ISSUE: Representation and mapping, Issues in knowledge Representation.

USING PREDICATE LOGIC: Representation simple facts in logic, Representation Instance, Computable Function and Predicates, Resolution, conversion to clause form, the unification Algorithm.

REPRESENTING KNOWLEDGE USING RULES: Procedural verses Declarative knowledge, logic programming. Forward and backward, Matching, Control Knowledge.

SYMBOLIC REASONING UNDER UNCERTAINTY: Introduction to non-monotonic reasoning, Logic for non-monotonic Reasoning. Implementation Issue, Augmenting a problem solver, Implementation of DFS, Implementation of BFS.

UNIT - III

WEAK SLOT AND FILTER STRUCTURE: Semantic nets-Intersection search, representing non binary predicates, partitioned semantic nets, Frame-Frames as sets and instances, slots.

STRONG SLOT AND FILTER STRUCTURE: conceptual dependency-the dependencies of conceptual dependency, Scripts

GAME PLAYING: Overview, The minimax search Procedure, Adding alpha-beta Cutoffs.

UNIT - IV

UNDERSTANDING: what is understanding-the conceptual dependency of a paragraph, what makes understanding, Understanding as constraint Satisfaction-applying constraints in analysis problems, Algorithm: waltz.

NATURAL LANGUAGE PROCESSING: Introduction, Syntactic processing-grammars and parsers, top down vs. bottom up, finding one interpretation or many, ATN, Semantic Analysis-lexical processing, sentence level processing, semantic grammars, case grammars .

LEARNING: what is learning, Rote learning, Learning by taking Advice, Learning in problem solving, learning from examples.

UNIT - V

EXPERT SYSTEMS: Representing and using domain Knowledge, expert system skills, Explanation, knowledge Acquisition.

PERCEPTION AND ACTION: Real -Time search, Perception-vision, speech recognition, Action.

TEXT BOOKS:

1. Rich knight (2002), *Artificial Intelligence*, 2nd edition, Tata McGraw-Hill, New Delhi.
2. Simon Haykin (1999), *Neural Networks: a comprehensive Foundation*, 2nd edition, Pearson Education, India.

REFERANCE BOOKS:

1. Patrick Henry Winston (2001), *Artificial Intelligence*, 3rd edition, Pearson Education Private Limited, India.
2. B. Yegnanarayana (2001), *Artificial Neural Networks,* Prentice Hall of India, New Delhi.

B. Tech. CSE VIII SEMESTER

NATURAL LANGUAGE PROCESSING
(Professional Elective - II)

Course Code: **A1535**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO NATURAL LANGUAGE UNDERSTANDING: The study of Language, Applications of NLP, Evaluating Language Understanding Systems, Different levels of Language Analysis, Representations and Understanding, Organization of Natural language Understanding Systems.

LINGUISTIC BACKGROUND: Words, Elements of simple noun phrases, verb phrases and simple sentences, noun phrases revisited, adjective phrases, adverbial phrases.

UNIT - II

GRAMMARS AND PARSING: Grammars and sentence Structure, Top-Down and Bottom-Up Parsers, Transition Network Grammars, Top- Down Chart Parsing, finite state models and morphological processing, grammars and logic programming.

FEATURES AND AUGMENTED GRAMMARS: Feature systems and augmented grammars, basic Feature system for English, Morphological Analysis and the Lexicon, Parsing with Features, Augmented Transition Networks.

GRAMMARS FOR NATURAL LANGUAGE: Auxiliary verbs and verb phrases, movement phenomena in language, handling questions in context-free grammar, relative clauses, the hold mechanism in ATNs, gap threading.

UNIT - III

TOWARD EFFICIENT PARSING: Human preferences in parsing, encoding uncertainty: shift-reduce parsers, deterministic parser, techniques for efficient encoding of ambiguity, partial parsing.

AMBIGUITY RESOLUTION: STATISTICAL METHODS: Basic probability theory, Estimating Probabilities, Part-of-Speech tagging, Obtaining Lexical Probabilities, Probabilistic Context-Free Grammars, Best First Parsing.

UNIT - IV

SEMANTICS AND LOGICAL FORM: Semantics and logical form, word senses and ambiguity, the basic logical form language, encoding ambiguity in the logical form, verbs and states in logical form, thematic roles, speech acts and embedded sentences and defining semantics structure model theory.

LINKING SYNTAX AND SEMANTICS: Semantic interpretation and compositionality**,** simple grammar and lexicon with semantic interpretation, prepositional phrases and verb phrases, lexicalized semantic interpretation and semantic roles, semantic interpretation using feature unification, generating sentences from logical form.

UNIT - V

AMBIGUITY RESOLUTION: Selectional restrictions, semantic filtering using selectional restrictions, semantic networks, statistical word sense disambiguation, statistical semantic preferences, combining approaches to disambiguation, grammatical relations, semantic grammars, template matching.

KNOWLEDGE REPRESENTATION AND REASONING: Knowledge representation, representation based on FOPC, Frames: representing stereotypical information, handling natural language quantification, time and aspectual classes of verbs automating deduction in logic-based representations, procedural semantics and question answering, hybrid knowledge representation.

TEXT BOOKS:

1. James Allen (2008), *Natural Language Understanding*, 2nd edition, Pearson Education, India.

REFERENCE BOOKS:

1. Akshar Bharti, Vineet Chaitanya, Rajeev Sangal(1996), *Natural Language Processing: a Paninian Perspective*, Prentice Hall of India, New Delhi.
2. Daniel Jurafsky, James H. Martin (2000), *Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics, and Speech Recognition,* Pearson Education, India.
3. Malgorzata Marciniak, Agnieszka Mykowiecka (2009), *Aspects of Natural Language Processing,* Springer, New York, USA.

B. Tech. CSE VIII SEMESTER

DISTRIBUTED DATABASES
(Professional Elective - II)

Course Code: **A1536**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: Features of distributed versus centralized databases, principles of distributed databases , levels of distribution transparency, reference architecture for distributed databases , types of data fragmentation, integrity constraints in distributed databases.

TRANSLATION OF GLOBAL QUERIES TO FRAGMENT QUERIES: Equivalence transformations for queries, transforming global queries into fragment queries, distributed grouping and aggregate function evaluation, parametric queries.

UNIT - II

OPTIMIZATION OF ACCESS STRATEGIES: A Framework for query optimization, join queries, general queries.

THE MANAGEMENT OF DISTRIBUTED TRANSACTIONS: A Framework for transaction management, supporting atomicity of distributed transactions, concurrency control for distributed transactions, architectural aspects of distributed transactions.

CONCURRENCY CONTROL: Foundation of distributed concurrency control, distributed deadlocks, concurrency control based on timestamps, optimistic methods for distributed concurrency control.

UNIT - III

RELIABILITY: Basic concepts, no blocking commitment protocols, reliability and concurrency control, determining a consistent view of the network, detection and resolution of inconsistency, checkpoints and cold restart.

DISTRIBUTED DATABASE ADMINISTRATION: Catalog management in distributed databases, authorization and protection.

UNIT - IV

ARCHITECTURAL ISSUES: Alternative client/server architectures, cache consistency object management, object identifier management, pointer swizzling, object migration, distributed object storage, object query processing, object query processor architectures, query processing issues, query execution , transaction management, transaction management in object database management systems , transactions as objects.

UNIT - V

DATABASE INTEROPERABILITY: Database integration scheme translation, scheme integration, query processing query processing layers in distributed multi- database management systems, query optimization issues. Transaction management, transaction and computation model, multi database concurrency control, multi database recovery, object orientation and interoperability, object management architecture, CORBA and database interoperability. Distributed component model, COM/OLE and database interoperability, push-based technologies.

TEXT BOOKS:

1. Stefano Ceri, Giuseppe Pelagatti (2008), *Distributed Database Principles & Systems*, Tata McGraw Hill, India.
2. M. Tamer Ozsu, Patrick Valduriez (2009), *Principles of Distributed Database Systems*, Pearson Education, India.

REFERENCE BOOKS:

1. Chanda Ray (2009), *Distributed Database Systems,* Pearson Education, India.

B. Tech. CSE VIII SEMESTER

MULTI - CORE ARCHITECTURE AND PROGRAMMING
(Professional Elective - II)

Course Code: **A1537**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION: The power and potential of parallelism, Examining sequential and parallel programs, Parallelism using multiple instruction streams, *The Goals:* Scalability and performance portability, Balancing machine specifics with portability, *A look at six parallel computers*: Chip multiprocessors, Symmetric multiprocessor architectures, Heterogeneous chip designs, Clusters, Supercomputers, Observations from the six parallel computers.

REASONING ABOUT PERFORMANCE: Motivation and basic concepts, Sources of performance loss, Parallel structure, Performance trade-offs, Measuring performance, Scalable performance.

UNIT - II

EXAMPLES OF MULTI-CORE ARCHITECTURES: Introduction to Intel Architecture, How an Intel Architecture System works, *Basic Components of the Intel Core 2 Duo Processor*: The CPU, Memory Controller, I/O Controller; *Intel Core i7:* Architecture, The Intel Core i7 Processor, Intel Quick Path Interconnect, The SCH; Intel Atom Architecture. Introduction to Texas Instruments' Multi-Core Multilayer SoC architecture for communications, infrastructure equipment.

PARALLEL ALGORITHM DESIGN: Introduction, The Task / Channel model, Foster's design methodology, *Examples:* Boundary value problem, finding the maximum, the n-Body problem, Adding data input.

UNIT - III

PARALLEL PROGRAMMING - 1 (USING OPENMP): *Designing for threads:* Task decomposition, Data decomposition, Data flow decomposition, Implications of different decompositions; Challenges in decomposition, Parallel programming patters, *A motivating problem*: Error diffusion.

THREADING AND PARALLEL PROGRAMMING CONSTRUCTS: Synchronization, Critical sections, Deadlocks, *Synchronization primitives:* Semaphores, Locks, Condition variables; Messages, *Flow Control-Based concepts*: Fence, Barrier; Implementation-Dependent threading issues.

UNIT -IV

PARALLEL PROGRAMMING - 2 (USING OPENMP): Introduction, The shared-memory model, Parallel *for* loops, Declaring private variables, Critical sections, Reductions, Performance improvements, More general data parallelism, Functional parallelism.

SOLUTIONS TO COMMON PARALLEL PROGRAMMING PROBLEMS: Too many threads, Data races, deadlocks, and live locks, heavily contended locks, Non-blocking algorithms, Thread-safe functions and libraries, Memory issues, Cache-related issues, Avoiding pipeline stalls, Data organization for high performance.

UNIT - V

THREADING IN THE PROCESSOR: ***Single-Core Processors***: Processor architecture fundamentals, Comparing Superscalar and EPIC architectures. ***Multi-Core Processors*:** Hardware-based threading, Hyper-threading technology, Multi-Core processors, multiple processor interactions, Power consumption, beyond multi-core architecture.

TEXT BOOKS:

1. Yun Calvin Lin, Lawrence Snyder (2009), *Principles of Parallel Programming*, Pearson Education Limited, India. (Listed topics only from Chapters 1, 2, 3)
2. Michael Jay Quinn (2004), *Parallel Programming in C with MPI and OpenMP*, Tata McGraw Hill Higher Education, USA. (Listed topics only from Chapters 3, 17)
3. Shameem Akhter, Jason Roberts (2006), *Multi-Core Programming: Increasing Performance through Software Multithreading*, Intel Press, USA. (Listed topics only from Chapters 3, 4, 7, 9, 10)

REFERENCE BOOKS:

1. Ananth Grama et. Al (2009), *Introduction to Parallel Computing*, Pearson Education, India
2. James Reinder (2007), *Intel Threading Building Blocks,* O'reilly Media Inc, USA.
3. David Culler, Jaswinder Pal Singh, Anoop Guptha(1999), *Parallel Computer Architecture: A Hardware/Software Approach*, Gulf Professional Publishing, Elsevier, USA.

B. Tech. CSE VIII SEMESTER

INFORMATION RETRIEVAL SYSTEM
Professional Elective - III
(Common to CSE & IT)

Course Code: **A1616**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO INFORMATION RETRIEVAL SYSTEMS: Definition, Objectives, Functional Overview, Relationship to Database Management Systems, Digital Libraries and Data Warehouses.

INFORMATION RETRIEVAL SYSTEM CAPABILITIES: Search, Browse and 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, Hidden Markov Models.

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.

INFORMATION VISUALIZATION: Introduction, Cognition and Perception, Information Visualization Technologies.

UNIT - IV

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 Systems, OPACs, Digital Libraries.

TEXT BOOKS:

1. Gerald J. Kowalski, Mark T. Maybury (2000), *Information Storage and Retrieval Systems: Theory and Implementation*, 2nd edition, Springer International Edition, USA.
2. Ricardo Baeza Yates, Berthier Ribeiro Neto (2009), *Modern Information Retrieval*, Pearson Education, India.

REFERENCE BOOKS:

1. Robert R. Korfhage (1997), *Information Storage and Retrieval,* John Wiley & Sons, India Edition, India.
2. Frakes W. B, Ricardo Baeza Yates (1992), *Information Retrieval Data Structures and Algorithms,* Pearson Education / Prentice Hall of India, New Delhi, India.

B. Tech. CSE VIII SEMESTER

SEMANTIC WEB AND SOCIAL NETWORKS
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1617**

L	T	P	C
3	1	-	4

UNIT - I

WEB INTELLIGENCE: Thinking and Intelligent Web Applications, The Information Age, The World Wide Web, Limitations of today's 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

KNOWLEDGE REPRESENTATION FOR THE SEMANTIC WEB: 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.

UNIT - III

ONTOLOGY ENGINEERING: Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

LOGIC, RULE AND INFERENCE: Logic and interface, Monotonic and Non monotonic rules, Description logic, Interface engines, RDF Interface engine.

UNIT - IV

SEMANTIC WEB APPLICATIONS, SERVICES AND TECHNOLOGY: Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base, XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods,

UNIT - V

SOCIAL NETWORK ANALYSIS AND SEMANTIC WEB: 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.

TEXT BOOKS:

1. Berners Lee, Godel, Turing, H. Peter Alesso Craig F. Smith (2009), *Thinking on the Web,* Wiley interscience.
2. Peter Mika (2007), *Social Networks and the Semantic Web,* Springer, USA.

REFERENCE BOOKS:

1. J. Davies, Rudi Studer, Paul Warren (2006), *Semantic Web Technologies, Trends and Research in Ontology Based Systems,* John Wiley & Sons, England.
2. Liyang Yu (2007), Introduction to the *Semantic Web and Semantic Web Services,* Chapman & Hall / CRC , USA.
3. Heiner Stuckenschmidt, Frank Van Ilarmelen (2005), *Information sharing on the semantic Web*, Springer Publications, New York.

B. Tech. CSE VIII SEMESTER

FAULT TOLERANT COMPUTING
(Professional Elective - III)

Course Code: **A1538**

L	T	P	C
3	1	-	4

UNIT - I

BASIC CONCEPTS OF RELIABILITY: Definition, failure rate, relation between reliability and mean time between failures; Faults in Digital Circuits – failures and faults, modeling of faults, temporary faults; Test Generation – fault diagnosis of digital systems, test generation for combinational logic circuits and sequential logic circuits, detection of multiple faults in combinational logic circuits.

UNIT - II

INTRODUCTION TO FAULT TOLERANT DESIGN OF DIGITAL SYSTEMS: Fault Tolerance, Static redundancy, Dynamic redundancy, Fault tolerant design of Memory systems using error correcting codes, Practical Fault Tolerant Systems: FTMP, ESS, COMTRAC.

UNIT - III

SELF CHECKING AND FAIL SAFE LOGIC: Introduction, design of totally self checking checkers, self checking sequential machines, partially self checking circuits, strongly fault secure circuits.

UNIT - IV

FAIL - SAFE DESIGN, TOTALLY SELF CHECKING PLA DESIGN AND DESIGN FOR TESTABILITY: Testability, Controllability and Observability, Design of testable Combinational Logic Circuits.

UNIT - V

TESTABLE DESIGN OF SEQUENTIAL CIRCUITS: The scan path technique for testable sequential circuit design, LSSD, Random Access Scan Technique, Built- In Test, design for autonomous Self-test, Designing testability into logic boards.

TEXT BOOKS:

1. Parag K. Lala (1985), *Fault Tolerant and Fault Testable Hardware Design*, Prentice Hall of India, New Delhi.

REFERENCE BOOKS:

1. D. K. Pradhan (1986), *Fault Tolerant Computing Theory and Techniques Volume*- I, Prentice Hall of India, New Delhi, India.
2. Nirajjha, Sandeep Gupta (2003), *Testing of Digital Systems*, Cambridge University Press, UK.

B. Tech. CSE VIII SEMESTER

GAME DEVELOPMENT USING CUDA
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1539**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION AND HISTORY: GPUs as Parallel Computers, Architecture of a Modem GPU, Why More Speed or Parallelism, Parallel Programming Languages and Models, Overarching Goals, Evolution of Graphics Pipelines, The Era of Fixed-Function, Graphics Pipelines, Evolution of Programmable Real-Time Graphics, Unified Graphics and Computing Processors, GPGPU, An Intermediate Step, GPU Computing, Scalable GPUs, Recent Developments, Future Trends.

UNIT - II

INTRODUCTION TO CUDA: Data Parallelism, CUDA Program Structure, A Matrix-Matrix Multiplication Example, Device Memories and Data Transfer, Kernel Functions and Threading, Function declarations, Kernel launch, Predefined variables, Runtime API.CUDA Thread Organization, Using b 1 0 C k Id X and t h re a d Id x , Synchronization and Transparent Scalability, Thread Assignment, Thread Scheduling and Latency Tolerance.

UNIT - III

CUDA MEMORIES: Importance of Memory Access Efficiency, CUDA Device Memory Types, a Strategy for Reducing Global Memory Traffic, Memory as a Limiting Factor to Parallelism, Global Memory Bandwidth.

DYNAMIC PARTITIONING OF SM RESOURCES: Data Perfecting, Instruction Mix, Thread Granularity, Measured Performance.

UNIT - IV

INTRODUCTION TO OPENCL: Introduction to OPENCL, Background, Data Parallelism Model, Device Architecture, Kernel Functions, Device Management and Kernel Launch, Electrostatic Potential Map in OpenCL.

UNIT - V

GAME DESIGN AND DEVELOPMENT: Concept of Game Design and Development and case studies.

TEXT BOOKS:

1. David B Kirk, Wen Mei W Hwu (2010), *Programming Massively Parallel Processors: A Hands - on Approach*, Elsevier India Private Limited, India.

REFEERENCE BOOKS:

1. Jason Sanders, Edward Kandrot (2010), Cuda by Example: An Introduction to General-Purpose GPU Programming, Addison-Wesley Professional, USA.
2. Steve Rabin (2010), Introduction to Game Development, Volume 2, 2nd edition, Course Technology, Cengage Learning, USA

WEB REFERENCES:

1. http://www.nvidia.co.in/object/cuda_home_new_in.html

B. Tech. CSE VIII SEMESTER

SOFTWARE ARCHITECTURE
Professional Elective - III
(Common to CSE & IT)

Course Code: **A1540**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO SOFTWARE ARCHITECTURE: Introduction to software architecture, status of software architecture, architecture business cycle, software architectures evolution. Software processes and the architecture business cycle, features of good architecture.

ARCHITECTURE STYLES: Pipes and filters, data abstraction and object oriented organization, even-based implicit invocation, layered systems, repositories, interpreters, process control, other familiar architectures, heterogeneous architectures.

UNIT - II

SHARED INFORMATION SYSTEMS: Database integration, interpretation in software development environments, architectural structures for shared information systems.

ARCHITECTURAL DESIGN GUIDANCE: Guidance for user interface architectures, case study in inter-operability: World Wide Web.

UNIT - III

PATTERN TYPES: Architectural patterns, structural patterns, patterns for distribution, patterns for interactive systems.

FORMAL MODELS AND SPECIFICATIONS: Formalizing the architectural of a specific system, architectural styles, architectural design space, Case study: a product line development.

UNIT - IV

LINGUISTIC ISSUES: Requirements for architectural-description languages, first-class connectors, adding implicit invocation to traditional programming languages.

TOOLS FOR ARCHITECTURAL DESIGN: *Unicon:* a universal connector language, exploiting style in architectural design environments, beyond definition /use: architectural interconnection

UNIT - V

CREATING AN ARCHITECTURE: Understanding quality attributes, achieving qualities, air traffic control, documenting software architectures.

TEXT BOOKS:

1. Mary Shaw, David Garlan (1996), *Software Architecture Perspective: on an Emerging Discipline*, Prentice Hall of India, New Delhi.
2. Len Bass, Paul Elements, Rick Kazman (1998), *Software Architecture in Practice*, Pearson Education Asia, India.

REFERENCE BOOKS:

1. Garmus, Herros(1996), *Measuring the Software Process: A Practical Guide to Functional Measure*, Prentice Hall of India, New Delhi.
2. Peters, Yourdon (1981), *Software Design: Methods and Techniques,* Yourdon Press, New York.
3. Buschmann (1996), *Pattern Oriented Software Architecture*, Wiley, New Delhi.
4. Gamma et al (1995), *Design Patterns*, Pearson Education Asia, New Delhi.
5. Gamma, Shaw(1993), *An Introduction to Software Architecture*, World Scientific Publishing Company,
6. Shaw, Gamma (1996), *Software Architecture*, Prentice Hall of India, New Delhi.

B. Tech. CSE VIII SEMESTER

SOFT COMPUTING
Professional Elective – III
(Common to CSE & IT)

Course Code: **A1541**

L	T	P	C
3	1	-	4

UNIT - I

BASICS OF ARTIFICIAL NEURAL NETWORK: Characteristics of Neural Networks, Structure and working of a biological neural network, Artificial neural network: terminology, models of neurons: McCulloch Pitts model, Perceptron model, Adaline model, topology, Basic learning laws.

FUNCTIONAL UNITS FOR ANN FOR PATTERN RECOGNITION TASK: Pattern recognition problem, Basic functional units, PR by functional units.

UNIT - II

FEEDFORWARD NEURAL NETWORKS:

SUPERVISED LEARNING - I: Perceptrons - Learning and memory, Learning algorithms, Error correction and gradient decent rules, Perceptron learning algorithms.

SUPERVISED LEARNING-II: Backpropogation, Multilayered network architectures, Back propagation learning algorithm, Example applications of feed forward neural networks.

UNIT - III

FEEDBACK NEURAL NETWORKS & SELF ORGANIZING FEATURE MAP: Introduction, Associative learning, Hopfield network, Error performance in Hopfield networks, simulated annealing, Boltzmann machine and Boltzmann learning, state transition diagram and false minima problem, stochastic update, simulated annealing, Boltzmann machine, bidirectional associative memory, bam stability analysis. Self organization, generalized learning laws, competitive learning, vector quantization, self organizing feature map, applications of self organizing feature map.

UNIT - IV

FUZZY LOGIC: Fuzzy set theory, crisp sets, operations on crisp set, fuzzy sets, fuzzy versus crisp, operations, fuzzy relations, crisp relations, properties. Fuzzy logic Application: Fuzzy Control of Blood Pressure.

UNIT - V

FUZZY LOGIC IN DATABASE AND INFORMATION SYSTEMS: Fuzzy Information, Fuzzy Logic in database Systems, Fuzzy Relational data Models, operations in Fuzzy Relational data Models, Design theory for Fuzzy Relational databases, Fuzzy information Retrieval and Web search, Fuzzy Object Oriented databases.

GENETIC ALGORITHMS: Introduction to Genetic Algorithms, Evolutionary Algorithms.

TEXT BOOKS:

1. Satish Kumar (2004), *Neural Networks A classroom Approach*, Tata McGraw Hill Publication, New Delhi.
2. Lotfi A. Zadeh(1997), *Soft computing and Fuzzy Logic*, World Scientific Publishing Co., Inc. River Edge, NJ, USA.

REFERENCE BOOKS:

1. B. Yegnanarayana (2006), *Artificial Neural Networks*, Prentice Hall of India, New Delhi, India.
2. John Yen, Reza Langari(2006), *Fuzzy Logic*, Pearson Education, New Delhi, India.
3. S. Rajasekaran, Vijaylakshmi Pari (2003), *Neural networks, Fuzzy Logic and Genetic Algorithms Synthesis and Applications*, Prentice Hall of India, New Delhi, India.

B. Tech. CSE VIII SEMESTER

SYSTEMS ANALYSIS AND DESIGN LABORATORY

Course Code: **A1542**

L	T	P	C
-	-	6	2

For Experiments 1 – 10, do the followings:

I. Prepare the SRS document. You have to identify the appropriate requirements for each problem.

II. Draw the Context flow diagrams, level 1 and level 2 DFDs, using any CASE tool.

III. Draw the Structure charts, using any CASE tool.

IV. Develop the corresponding software using C with a user friendly GUI and appropriate Database.

LIST OF EXPERIMENTS:

1. Develop a Library Information System for a technological University.
2. Develop a software for student registration in a technological University.
3. Develop a software for hall management of your Institute.
4. Develop a software for the Guesthouse automation of your Institute.
5. Develop a software for automating various bookkeeping activities of the student's cooperative store of your Institute.
6. Develop the Student's Academic Record Management Software of your Institute.
7. Develop a word processing software with some limited number of facilities such as making bold, italics, underline, cut, copy and paste etc.
8. Develop a graphics editor software package, using which one can create / modify several common types of graphics entities.
9. Develop a software for automating the various activities associated with developing a CASE tool for structured software analysis.
10. Develop a software for automating various activities of the department offices of your Institute.

B. Tech. CSE VIII SEMESTER

TECHNICAL SEMINAR

Course Code: **A1543**

L	T	P	C
-	-	6	2

1. OBJECTIVE:

Seminar is an important component of learning in an Engineering College, where the student gets acquainted with preparing a report & presentation on a topic.

2. **PERIODICITY / FREQUENCY OF EVALUATION: Twice**

3. PARAMETERS OF EVALUATION:

1. The seminar shall have two components, one chosen by the student from the course-work without repetition and approved by the faculty supervisor. The other component is suggested by the supervisor and can be a reproduction of the concept in any standard research paper or an extension of concept from earlier course work.
2. The two components of the seminar are distributed between two halves of the semester and are evaluated for 50 marks each. The average of the two components shall be taken as the final score.
3. The students shall be required to submit the rough drafts of the seminar outputs within one week of the commencement of the class work.
4. Supervisor shall make suggestions for modification in the rough draft. The final draft shall be presented by the student within a week thereafter.
5. Presentation schedules will be prepared by different Departments in line with the academic calendar.

The Seminars shall be evaluated in two stages as follows:

A. Rough draft

In this stage, the student should collect information from various sources on the topic and collate them in a systematic manner. He/ She may take the help of the concerned supervisor.

The report should be typed in “MS-Word” file with “calibri” font, with font size of 16 for main heading, 14 for sub-headings and 11 for the body text. The contents should also be arranged in Power Point Presentation with relevant diagrams, pictures and illustrations. It should normally contain 18 to 25 slides, consisting of the followings:

1.	Topic, name of the student & guide	1 Slide
2.	List of contents	1 Slide
3.	Introduction	1 - 2 Slides
4.	Descriptions of the topic (point-wise)	7 - 10 Slides
5.	Images, circuits etc.	6 - 8 Slides
6.	Conclusion	1 - 2 Slides
7.	References/Bibliography	1 Slide

The soft copy of the rough draft of the seminar presentation in MS Power Point format along with the draft Report should be submitted to the concerned supervisor, with a copy to the concerned HOD within 30 days of the commencement of class work.

The evaluation of the Rough draft shall generally be based upon the following.

1.	Punctuality in submission of rough draft and discussion	2 Marks
2.	Resources from which the seminar have been based	2 Marks
3.	Report	3 Marks
4.	Lay out, and content of Presentation	3 Marks
5.	Depth of the students knowledge in the subject	5 Marks
Total		15 Marks

After evaluation of the first draft the supervisor shall suggest further reading, additional work and fine tuning, to improve the quality of the seminar work.

Within 7 days of the submission of the rough draft, the students are to submit the final draft incorporating the suggestions made by the supervisor.

B. Presentation:

After finalization of the final draft, the students shall be allotted dates for presentation (in the designated seminar classes) and they shall then present it in presence students, supervisor, faculties of the department and at least one faculty from some department / other department.

The student shall submit 3 copies of the Report neatly bound along with 2 soft copies of the PPT in DVD medium. The students shall also distribute the title and abstract of the seminar in hard copy to the audience. The final presentation has to be delivered with 18-25 slides.

The evaluation of the Presentation shall generally be based upon the following.

1.	Contents	10 Marks
2.	Delivery	10 Marks
3.	Relevance and interest the topic creates	5 Marks
4.	Ability to involve the spectators	5 Marks
5.	Question answer session	5 Marks
Total		35 Marks

4. WHO WILL EVALUATE?

The presentation of the seminar topics shall be made before an internal evaluation committee comprising the Head of the Department or his/her nominee, seminar supervisor and a senior faculty of the department / other department.

B. Tech. CSE VIII SEMESTER

COMPREHENSIVE VIVA

Course Code: **A1544**

L	T	P	C
-	-	-	2

1. OBJECTIVE:

- To enable the examiners to assess the candidate's knowledge in his or her particular field of learning.
- To test the student's awareness of the latest developments and relate them to the knowledge acquired during the classroom teaching.

2. PARAMETERS OF EVALUATION:

Subject Knowledge	Current Awareness	Career Orientation	Communication Skills	Total
20	10	10	10	50

3. WHO WILL EVALUATE?

The comprehensive Viva will be conducted by a committee comprising Head of the Department or his/her nominee, two senior faculty of the respective department and an external examiner from outside the college. The comprehensive viva shall be evaluated for 50 marks at the end of VIII semester. A minimum of 40% of maximum marks shall be obtained to earn the corresponding credits.

4. **PERIODICITY / FREQUENCY OF EVALUATION: Once**

5. PEDAGOGY:

- The viva will be held on a face to face basis.
- The students will be expected to answer the questions related to latest developments and all courses taken till date.
- Viva voce will be conducted within week before the beginning of midterm examinations. However, in exceptional circumstances it can be scheduled immediately after the end of midterm examinations.
- Students will have to make themselves available on the date of the viva voce.

B. Tech. CSE VIII SEMESTER

MINI PROJECT / PROJECT WORK

Course Code: **A1545/ A1532**

L	T	P	C
-	-	12	8

1. OBJECTIVE:

The main objective of the Project Work is for the students to learn and experience all the major phases and processes involved in solving "real life engineering problems".

2. EXPECTED OUTCOME:

The major outcome of the B. Tech project must be well-trained students. More specifically students must have acquired:

- System integration skills
- Documentation skills
- Project management skills
- Problem solving skills

3. PROJECT SELECTION:

Projects are suggested by the faculty, with or without collaboration with an industry. All faculty are to suggest projects. Students are also encouraged to give project proposals after identifying a faculty who would be willing to supervisor the work. A Project brief is to be given by the faculty to the group defining the project comprehensively.

All B. Tech major projects are to be done in the Institute. For industry specified projects, students will be permitted to spend 1-2 weeks in the industry on recommendation by the supervisor. The number of students per batch should be between 2 and 4. If more number of students is really needed, the project may be split into functional modules and given to subgroups.

4. WHO WILL EVALUATE?

The end semester examination shall be based on the report submitted and a viva-voce exam for 150 marks by committee comprising of the Head of the Department, project supervisor and an external examiner.

5. EVALUATION:

The basic purpose is to assess the student competencies with regard to his project work. More specifically to assess the student's individual contribution to the project, to establish the level of understanding of basic theoretical knowledge relevant to the project and to ensure that the student has good understanding and appreciation of design and development decisions taken in the course of the project. It is desirable that all faculty members are present for the evaluations as this is a platform to get to know the student projects and to motivate the students to do good projects. The faculty should adopt a clear and consistent pattern of asking questions from general to specific aspects of the project. The presentation and evaluation is open to other students of the department.

The project work shall be evaluated for 200 marks out of which 50 marks for internal evaluation and 150 marks for end-semester evaluation. The evaluation shall be done on the following basis

Semester VII	**Semester VIII**
Preliminary Evaluation - 10 marks	Design Evaluation II - 25 marks
Design Evaluation I - 15 marks	Final Evaluation – 150 marks

6. GUIDELINES FOR THE PREPARATION OF B. TECH PROJECT REPORTS

6.1. Project reports should be typed neatly only on one side of the paper with 1.5 or double line spacing on a A4 size bond paper (210 x 297 mm). The margins should be: Left - 1.25", Right - 1", Top and Bottom - 0.75".

6.2. The total number of reports to be prepared are:

- One copy to the department

- One copy to the concerned guide(s)
- One copy to the candidate.

6.3. Before taking the final printout, the approval of the concerned guide(s) is mandatory and suggested corrections, if any, must be incorporated.

6.4. For making copies dry tone Xerox is suggested.

6.5. Every copy of the report must contain

- Inner title page (White)
- Outer title page with a plastic cover
- Certificate in the format enclosed both from the college and the organization where the project is carried out.
- An abstract (synopsis) not exceeding 100 words, indicating salient features of the work.

6.6. The organization of the report should be as follows:

1.	Inner title page	Usually numbered in roman
2.	Abstract or Synopsis	
3.	Acknowledgments	
4.	Table of Contents	
5.	List of table & figures (optional)	

6.7 Chapters (to be numbered) containing Introduction, which usually specifies the scope of work and its importance and relation to previous work and the present developments, Main body of the report divided appropriately into chapters, sections and subsections.

- The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc., and subsections as 2.2.3, 2.5.1 etc.
- The report should be typed in "MS-Word" file with "calibri" font. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 11.
- The figures and tables must be numbered chapter wise for e.g.: Fig. 2.1 Block diagram of a serial binary adder, Table 3.1 Primitive flow table, etc.
- The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.

6.8. Reference OR Bibliography: The references should be **numbered serially** in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [3]. The section on references should list them in serial order in the following format.

1. For textbooks - A.V. Oppenheim and R.W. Schafer, Digital Signal Processing, Englewood, N.J., Prentice Hall, 3 Edition, 1975.
2. For papers - Devid, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.

6.9. Only SI units are to be used in the report. Important equations must be numbered in decimal form for e.g. **V = IZ** ..... **(3.2)**

6.10. All equation numbers should be right justified.

6.11. The project report should be brief and include descriptions of work carried out by others only to the minimum extent necessary. Verbatim reproduction of material available elsewhere should be strictly avoided. Where short excerpts from published work are desired to be included, they should be within quotation marks appropriately referenced.

6.12. Proper attention is to be paid not only to the technical contents but also to the organization of the report and clarity of the expression. Due care should be taken to avoid spelling and typing errors. The student should note that report-write-up forms the important component in the overall evaluation of the project

6.13. Hardware projects must include: the component layout, complete circuit with the component list containing the name of the component, numbers used, etc. and the main component data sheets as Appendix. At the time of report submissions, the students must hand over a copy of these details to the project coordinator and see that they are entered in proper registers maintained in the department.

6.14. Software projects must include a virus free disc, containing the software developed by them along with the read me file. Read me file should contain the details of the variables used, salient features of the software and procedure of using them: compiling procedure, details of the computer hardware/software requirements to run the same, etc. If the developed software uses any public domain software downloaded from some site, then the address of the site along with the module name etc. must be included on a separate sheet. It must be properly acknowledged in the acknowledgments.

6.15. Sponsored Projects must also satisfy the above requirements along with statement of accounts, bills for the same dully attested by the concerned guides to process further, They must also produce NOC from the concerned guide before taking the internal viva examination.

6.16. The reports submitted to the department/guide(s) must be hard bounded, with a plastic covering.

6.17. Separator sheets, used if any, between chapters, should be of thin paper

VARDHAMAN COLLEGE OF ENGINEERING

(Autonomous)

Shamshabad – 501 218, Hyderabad, Andhra Pradesh, India

Department of ……..

CERTIFICATE

Certified that the project work entitled …….. carried out by Mr./Ms. ……., Roll Number ……, a bonafide student of ……in partial fulfillment for the award of **Bachelor of Technology** in …… of the Jawaharlal Nehru Technological University, Hyderabad during the year …….. It is certified that all corrections / suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Name & Signature of the Guide **Name Signature of the HOD** **Signature of the Principal**

External Viva

Name of the examiners Signature with date

1.

2.

CERTIFICATE ISSUED AT THE ORGANIZATION WHERE THE PROJECT WAS CARRIED OUT

(On a separate sheet, If applicable)

NAME OF THE INDUSTRY / ORGANIZATION, Address with pin code

CERTIFICATE

Certified that the project work entitled …….. carried out by Mr./Ms . ……., Roll Number……., a bonafide student of ……in partial fulfillment for the award of **Bachelor of Technology** in …… of the Jawaharlal Nehru Technological University, Hyderabad during the year …….. It is certified that, he/she has completed the project satisfactorily

Name & Signature of the Guide **Name & Signature of the Head of Organization**

7. **DISTRIBUTION OF MARKS FOR B.TECH DISSERTATION EVALUATION**

S No.	Particulars	Max. Marks
1	Relevance of the subject in the present context	**10**
2	Literature Survey	**10**
3	Problem formulation	**20**
4	Experimental observation / theoretical modeling	**10**
5	Results – Presentation & Discussion	**20**
6	Conclusions and scope for future work	**10**
7	Overall presentation of the Thesis / Oral presentation	**40**
8	Project Report Writing	**30**
Total Marks		**150**

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 sent to the University.
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 University 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 University 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	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

	written or by signs 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.	the 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 University 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.	

Frequently asked Questions and Answers about autonomy

1. Who grants Autonomy? UGC, Govt., AICTE or University

In case of Colleges affiliated to a university and where statutes for grant of autonomy are ready, it is the respective University that finally grants autonomy.

2. Shall VCE award its own Degrees?

No. Degree will be awarded by Jawaharlal Nehru Technological University, Hyderabad with a mention of the name Vardhaman College of Engineering on the Degree Certificate.

3. What is the difference between a Deemed University and an Autonomy College?

A Deemed University is fully autonomous to the extent of awarding its own Degree. A Deemed University is usually a Non-Affiliating version of a University and has similar responsibilities like any University. An Autonomous College enjoys Academic Autonomy alone. The University to which an autonomous college is affiliated will have checks on the performance of the autonomous college.

4. How will the Foreign Universities or other stake – holders know that we are an Autonomous College?

Autonomous status, once declared, shall be accepted by all the stake holders. Foreign Universities and Indian Industries will know our status through our college website.

5. What is the change of Status for Students and Teachers if we become Autonomous?

An autonomous college carries a prestigious image. Autonomy is actually earned out of continued past efforts on academic performances, capability of self-governance and the kind of quality education we offer.

6. Who will check whether the academic standard is maintained / improved after Autonomy? How will it be checked?

There is a built in mechanism in the autonomous working for this purpose. An Internal Committee called Academic Programme Evaluation Committee is a Non – Statutory body, which will keep a watch on the academics and keep its reports and recommendations every year. In addition to Academic Council, the highest academic body also supervises the academic matters. At the end of three years, there is an external inspection by the University for this purpose. The standards of our question papers, the regularity of academic calendar, attendance of students, speed and transparency of result declaration and such other parameters are involved in this process.

7. Will the students of VCE as an Autonomous College qualify for University Medals and Prizes for academic excellence?

No. VCE has instituted its own awards, medals, etc. for the academic performance of the students. However for all other events like sports, cultural and co-curricular organized by the University the students shall qualify.

8. Can VCE have its own Convocation?

No, since the University awards the Degree the Convocation will be that of the University.

9. Can VCE give a provisional degree certificate?

Since the examinations are conducted by VCE and the results are also declared by VCE, the college sends a list of successful candidates with their final percentage of marks to the University. Therefore with the prior permission of the University the college will be entitled to give the provisional certificate.

10. Will Academic Autonomy make a positive impact on the Placements or Employability?

Certainly. The number of students qualifying for placement interviews is expected to improve, due to rigorous and repetitive classroom teaching and continuous assessment, besides the autonomous status is more responsive to the needs of the industry. As a result, there will be a lot of scope for industry oriented skill development built-in into the system. The graduates from an autonomous college will therefore represent better employability.

11. What is the proportion of Internal and External Assessment as an Autonomous College?

Presently, it is 25 % for internal assessment and 75 % for external assessment. As the autonomy matures the internal assessment component shall be increased at the cost of external assessment.

12. Will there be any Revaluation or Re-Examination System?

No. There will not be any Revaluation system or Re-examination. But, there is a personal verification of the answer scripts.

13. How fast Syllabi can be and should be changed?

Autonomy allows us the freedom to change the syllabi as often as we need.

14. Will the Degree be awarded on the basis of only final year performance?

No. The percentage of marks will reflect the average performance of all the semesters put together.

15. Who takes Decisions on Academic matters?

The Academic Council of College is the top academic body and is responsible for all the academic decisions. Many decisions are also taken at the lower level like the BOS which are like Boards of Studies of the University.

16. What is the role of Examination committee?

The Exam Committee is responsible for the smooth conduct of inter and external examinations. All matters involving the conduct of examinations, spot valuations, tabulations, preparation of Memorandum of Marks etc fall within the duties of the Examination Committee.

17. Is there any mechanism for Grievance Redressal?

Yes, the college has grievance redressal committee, headed by a senior faculty member of the college.

18. How many attempts are permitted for obtaining a Degree?

All such matters are defined in Rules & Regulations.

19. Who declares the result?

The result declaration process is also defined. After tabulation work the entire result is reviewed by the Moderation Committee. Any unusual deviations or gross level discrepancies are deliberated and removed. The entire result is discussed in the College Academic Council for its approval. The result is then declared on the college notice boards as well put on the web site of the college. It is eventually sent to the University.

20. What is our relationship with the Jawaharlal Nehru Technological University, Hyderabad?

We remain an affiliated college of the Jawaharlal Nehru Technological University, Hyderabad. The University has the right to nominate its members on the academic bodies of the college.

21. Shall we require University approval if we want to start any New Courses?

Yes, It is expected that approvals or such other matters from an autonomous college will receive priority.

22. Shall we get autonomy for PG and Doctoral Programmes also?

Yes, presently our PG programmes are also enjoying autonomous status.

23. How many exams will be there as an autonomous college?

This is defined in the Rules & Regulations.