VARDHAMAN COLLEGE OF ENGINEERING
(AUTONOMOUS)
(Permanently Affiliated to JNTUH, Approved by AICTE, New Delhi and Accredited by NBA)
Shamshabad - 501 218, Hyderabad

ACADEMIC REGULATIONS (VCE R-11A), COURSE STRUCTURE AND SYLLABI FOR B. TECH (I & II SEMESTERS) UNDER AUTONOMOUS STATUS FOR 2013 ADMITTED BATCH

B.Tech. Regular Four Year Degree Programme
(For the batches admitted from the academic year 2013 - 2014)
&
B.Tech. (Lateral Entry Scheme)
(For the batches admitted from the academic year 2014 - 2015)

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, A1001: Mathematics - I, A1503: 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 2013 - 14)
&
B.Tech. (Lateral Entry Scheme)
(for the batches admitted from the academic year 2014 - 15)

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 2013-2014 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. MEDIUM OF INSTRUCTION
The medium of instruction and examinations for all courses is English.

6. DURATION OF THE PROGRAMS

6.1 Normal Duration

6.1.1 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.

6.1.2 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.

6.2 Maximum Duration

6.2.1 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.

6.2.2 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.

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

7. 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)	Instruction Period : 17 weeks	19 weeks
	Continuous Assessment Tests and Mid Semester Test : 2 weeks	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Semester Break		2 weeks
SECOND SEMESTER (23 weeks)	Instruction Period : 17 weeks	19 weeks
	Continuous Assessment Tests and Mid Semester Test : 2 weeks	
	Preparation & Practical Examinations	2 weeks
	External Examinations	2 weeks
Summer Vacation		4 weeks

8. 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**

9. **CREDIT BASED SYSTEM**

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

9.1.   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.

9.2.   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.

9.3.   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.

10.   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.

10.1   Theory Courses

The evaluation of the students in a course is a continuous process and is based on their performance in different examinations as mentioned below:

Continuous Assessment Test	10 marks
Mid Semester Test	15 marks
End Semester Examination	75 marks

10.1.1.   Continuous Assessment Tests

There will be two Continuous Assessment Tests in theory courses having a weightage of 10 marks to be answered in two hours duration each. The first Continuous Assessment Test will be held in the 7th week with the announced schedule in the first two units of syllabus. The second Continuous Assessment Test will be held at the end of the semester with the announced schedule in the fourth and fifth units of syllabus. Marks shall be awarded considering the average of two Continuous Assessment Tests in each course. In case a student does not appear in the Continuous Assessment Tests due to any reason whatsoever, will get zero marks(s).

10.1.2.   Mid Semester Test

There will be one Mid Semester Test in theory courses for a maximum of 15 marks to be answered in two hours duration. The Mid Semester Test will be held in the 10th week with the announced schedule in the first three units of syllabus. In case a student does not appear in the Mid Semester Test due to any reason whatsoever, will get zero marks(s).

10.1.3.   End Semester Examination

The end semester examination question paper in theory courses 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.

The question paper shall be set externally and valued both internally and externally. If the difference between the first and second valuations is less than or equal to 15% of the maximum of the paper the better of the two valuations shall be awarded and if the difference between the first and second valuation is more than 15%, the chief examiner appointed has to discuss with the two valuers and have his own assessment of the script. The marks given by the chief examiner shall be final for award.

10.2   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.

10.3.   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.

10.4. 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.

10.5. **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.

10.6. **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.

10.7. **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.

10.8. **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.

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

11.1. 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.

11.2. 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.

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

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

11.5.   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.

11.6.   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.

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

11.8.   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.

12.   MISSING EXAMINATION

A student who fails to attend a Continuous Assessment Test / Mid Semester Test due to hospitalization or accident shall be permitted with prior approval of the HOD and Dean (UG) to take up missing examination of the particular course, subject to payment of Rs.600/- for each missing examination. Students deputed for official programmes of the college are exempted from paying the fee for missing test. Such missing examinations should be completed outside the regular class hours within 7 working days of the respective examinations. Attendance will not be given for taking up missing examinations. The missing examinations are allowed only for Continuous Assessment Test / Mid Semester Test and not for end semester final theory and practical examinations.

13.   EVALUATION
Following procedure governs the evaluation.

13.1.   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.

13.2.   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.

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

14.   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.

15.   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.

16.   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 2014–2015)

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.

17. 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.

18. 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.

19. AWARD OF DEGREE

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

19.1. 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.

19.2. 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

20. 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.

21. REGISTRATION

21.1. Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the Academic Calendar IN PERSON. It is absolutely compulsory for the student to register for courses in time. IN ABSENTIA registration will not be permitted under any circumstance.

21.2. Registration without fine: The courses prescribed for a semester can be registered on the date scheduled in the academic calendar. The registration is also permitted on the second day (which is the first working day of the semester) without fine.

21.3. Registration with fine: Late registration shall be permitted by the HOD concerned up to seven working days inclusive of the date of registration on payment of a late registration fee of Rs.500/- (Rupees Five hundred only)

21.4. Procedure to get permission for late registration: The student concerned shall apply with proper reason to the HOD concerned through the Academic Counselor to get the permission of the Dean (UG) for the late registration of the courses. Beyond the prescribed time limit, no student shall be permitted to register the courses for a particular semester.

22. 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.

23. CURRICULUM

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

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

24. 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.

25. 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.

26. 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.

27. 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.

28. 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.

29. 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.

30. AWARD OF A RANK UNDER AUTONOMOUS SCHEME

30.1. 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.

30.2. 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.

30.3. 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.

30.4. 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.

30.5. 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.

31. CONDUCT AND DISCIPLINE

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

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

31.3 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.

31.4 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.

31.5 **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.**

31.6 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.

31.7 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.

31.8 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.

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

32. 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.

33. 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

I SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
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
A1305	Computer Aided Engineering Drawing Lab	BE	-	-	6	2	25	50	75
TOTAL			**18**	**02**	**12**	**26**	**200**	**525**	**725**

II SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
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
A1601	PC Software Lab	BE	-	-	6	2	25	50	75
TOTAL			**18**	**02**	**12**	**26**	**200**	**525**	**725**

III SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
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-R11A

IV SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
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	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
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	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1430	Embedded Systems	CE	4	-	-	4	25	75	100
A1607	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

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1606	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

B. TECH - COMPUTER SCIENCE AND ENGINEERING

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	
A1611	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
A1609	Building Enterprise Applications
A1610	Bioinformatics
A1527	Rational Application Developer
A1528	Advanced Computer Architecture
A1529	Distributed Operating Systems
PROFESSIONAL ELECTIVE - II	
A1614	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	
A1619	Information Retrieval System
A1620	Semantic Web and Social Networks
A1538	Fault Tolerant Computing
A1539	Game Development Using CUDA
A1540	Software Architecture
A1541	Soft Computing

B. TECH - INFORMATION TECHNOLOGY

I SEMESTER

Code	Subject	Category	Periods per Week L	T	P	Credits	Internal	External	Total
A1008	Technical English	HS	4	-	-	4	25	75	100
A1001	Mathematics – I	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
A1201	Basic Electrical Engineering	BE	3	1	-	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	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

II SEMESTER

Code	Subject	Category	Periods per Week L	T	P	Credits	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
A1005	Probability, Statistics and Computational Techniques	BS	3	1	-	4	25	75	100
A1503	Data Structures through C	BE	4	-	-	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	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

III SEMESTER

Code	Subject	Category	Periods per Week L	T	P	Credits	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 - INFORMATION TECHNOLOGY

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
A1602	Data Communications Systems	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
A1510	Theory of Computation	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
A1517	Design and Analysis of Algorithms	CE	3	1	-	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
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
A1606	Wireless and Mobile Computing	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 - INFORMATION TECHNOLOGY

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1524	Software Project Management	CE	4	-	-	4	25	75	100
A1525	Software Testing and Quality Assurance	CE	4	-	-	4	25	75	100
A1607	Network Security and Cryptography	CE	4	-	-	4	25	75	100
A1608	Mobile Application Development through J2ME	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
A1612	Mobile Application Development through J2ME Lab	CE	-	-	3	2	25	50	75
A1613	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	CE	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
A1622	Technical Seminar	TS	-	-	6	2	50	-	50
A1623	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1624	Mini Project	MP	-	-	-	2	50	-	50
A1613	Project Work (Stage – II)	PW	-	-	12	8	50	150	200
	TOTAL		**09**	**03**	**24**	**28**	**250**	**500**	**750**

B. TECH - INFORMATION TECHNOLOGY

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	
A1526	Data Mining and Data Warehousing
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
A1527	Rational Application Developer
A1529	Distributed Operating Systems
A1609	Building Enterprise Applications
A1610	Bioinformatics
A1611	Image Processing
PROFESSIONAL ELECTIVE - II	
A1533	Business Intelligence and Analytics
A1614	Grid and Cloud Computing
A1615	Geographical Information Systems
A1616	Ad- Hoc and Sensor Networks
A1617	Multimedia and Rich Internet
A1618	Service Oriented Architecture
PROFESSIONAL ELECTIVE - III	
A1539	Game Development Using CUDA
A1540	Software Architecture
A1541	Soft Computing
A1619	Information Retrieval Systems
A1620	Semantic Web and Social Networks
A1621	Network Management System

B. TECH - ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS: VCE-R11A

I SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
A1001	Mathematics – I	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
A1501	Computer Programming	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
A1502	Computer Programming Lab	BE	-	-	3	2	25	50	75
A1601	PC Software Lab	BE	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

II SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
A1004	Environmental Science	BS	4	-	-	4	25	75	100
A1006	Computational Techniques	BS	3	1	-	4	25	75	100
A1007	Mathematics – II	BS	3	1	-	4	25	75	100
A1008	Technical English	HS	4	-	-	4	25	75	100
A1503	Data Structures through C	BE	4	-	-	4	25	75	100
A1009	English Language Communication Skills Lab	HS	-	-	3	2	25	50	75
A1504	Data Structures through C Lab	BE	-	-	3	2	25	50	75
A1305	Computer Aided Engineering Drawing Lab	BE	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

III SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
A1011	Mathematics – III	BS	3	1	-	4	25	75	100
A1401	Electronic Devices	BE	3	1	-	4	25	75	100
A1402	Signals and Systems	CE	3	1	-	4	25	75	100
A1403	Probability Theory and Stochastic Processes	CE	4	-	-	4	25	75	100
A1404	Digital Logic Design	CE	4	-	-	4	25	75	100
A1206	Principles of Electrical Engineering	CE	4	-	-	4	25	75	100
A1406	Electronic Devices Lab	BE	-	-	3	2	25	50	75
A1208	Electrical Engineering Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS: VCE-R11A

IV SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1013	Managerial Economics and Financial Analysis	HS	4	-	-	4	25	75	100
A1509	Computer Architecture and Organization	CE	4	-	-	4	25	75	100
A1212	Control Systems	CE	3	1	-	4	25	75	100
A1408	Electronic Circuit Analysis	CE	4	-	-	4	25	75	100
A1409	Pulse and Digital Circuits	CE	3	1	-	4	25	75	100
A1410	Electromagnetic Theory and Transmission Lines	CE	3	1	-	4	25	75	100
A1412	Electronic Circuit Analysis Lab	CE	-	-	3	2	25	50	75
A1413	Pulse and Digital Circuits Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

V SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1506	Object Oriented Programming through JAVA	CE	4	-	-	4	25	75	100
A1414	Electronic Measurements and Instrumentation	CE	4	-	-	4	25	75	100
A1415	Integrated Circuits Applications	CE	3	1	-	4	25	75	100
A1416	Digital Design through Verilog HDL	CE	4	-	-	4	25	75	100
A1417	Analog Communications	CE	3	1	-	4	25	75	100
A1418	Antennas and Wave Propagation	CE	3	1	-	4	25	75	100
A1420	Integrated Circuits Applications Lab	CE	-	-	3	2	25	50	75
A1421	Analog Communications Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

VI SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1515	Computer Networks	CE	4	-	-	4	25	75	100
A1423	Microprocessors and Interfacing	CE	3	1	-	4	25	75	100
A1424	Digital Communications	CE	3	1	-	4	25	75	100
A1425	Digital Signal Processing	CE	3	1	-	4	25	75	100
A1426	Microwave Engineering	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - I	HS	4	-	-	4	25	75	100
A1427	Microprocessors and Interfacing Lab	CE	-	-	3	2	25	50	75
A1428	Digital Signal Processing Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH – ELECTRONICS AND COMMUNICATION ENGINEERING

VII 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	4	-	-	4	25	75	100
A1429	VLSI Design	CE	3	1	-	4	25	75	100
A1430	Embedded Systems	CE	3	1	-	4	25	75	100
A1431	Cellular and Mobile Communications	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - II	IE	4	-	-	4	25	75	100
	PROFESSIONAL ELECTIVE - I	PE	4	-	-	4	25	75	100
A1438	Digital Communications and Microwave Engineering Lab	CE	-	-	3	2	25	50	75
A1439	VLSI Lab	CE	-	-	3	2	25	50	75
A1440	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
A1441	Satellite and Radar Communications	CE	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
A1454	Embedded Systems Lab	CE	-	-	6	2	25	50	75
A1455	Technical Seminar	TS	-	-	6	2	50	-	50
A1456	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1457	Mini Project	MP	-	-	-	2	50	-	50
A1440	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
	TOTAL		09	03	24	28	250	500	750

B. TECH – ELECTRONICS AND COMMUNICATION ENGINEERING

REGULATIONS: VCE-R11A

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	
A1508	Operating Systems
A1528	Advanced Computer Architecture
A1607	Network Security and Cryptography
A1228	Energy Management
A1331	Operations Research
A1725	Avionics
PROFESSIONAL ELECTIVE - I	
A1432	Telecommunication Switching Systems
A1433	Digital Image Processing
A1434	CPLD and FPGA Architectures and Applications
A1435	Real Time Operating Systems
A1436	Mobile Computing Technologies
A1437	Optical Communications
PROFESSIONAL ELECTIVE - II	
A1442	Wireless Communications and Networks
A1443	DSP Processors and Architectures
A1444	Low Power VLSI Design
A1445	Software Radio
A1446	Artificial Neural Networks and Fuzzy Logic
A1344	Nanotechnology
PROFESSIONAL ELECTIVE - III	
A1447	High Speed Networks
A1448	Speech Signal Processing
A1449	Design of Fault Tolerant Systems
A1450	Biomedical Instrumentation
A1451	RF Circuit Design
A1452	Optical Networks

B. TECH – ELECTRICAL AND ELECTRONICS ENGINEERING

REGULATIONS: VCE-R11A

I SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1001	Mathematics – I	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
A1501	Computer Programming	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
A1502	Computer Programming Lab	BE	-	-	3	2	25	50	75
A1601	PC Software Lab	BE	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

II SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1008	Technical English	HS	4	-	-	4	25	75	100
A1007	Mathematics-II	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
A1503	Data Structures through C	BE	4	-	-	4	25	75	100
A1009	English Language Communication Skills Lab	HS	-	-	3	2	25	50	75
A1504	Data Structures through C Lab	BE	-	-	3	2	25	50	75
A1305	Computer Aided Engineering Drawing Lab	BE	-	-	6	2	25	50	75
	TOTAL		**18**	**02**	**12**	**26**	**200**	**525**	**725**

III SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1011	Mathematics – III	BS	3	1	-	4	25	75	100
A1401	Electronic Devices	BE	4	-	-	4	25	75	100
A1013	Managerial Economics and Financial Analysis	CE	4	-	-	4	25	75	100
A1404	Digital Logic Design	CE	3	1	-	4	25	75	100
A1203	Network Analysis	CE	4	-	-	4	25	75	100
A1204	DC Machines	CE	3	1	-	4	25	75	100
A1406	Electronic Devices Lab	BE	-	-	3	2	25	50	75
A1207	Electric Circuits and Simulation Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH – ELECTRICAL AND ELECTRONICS ENGINEERING

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1509	Computer Architecture and Organization	CE	4	-	-	4	25	75	100
A1411	Electronic Circuits	CE	3	1	-	4	25	75	100
A1209	Power System Generation	CE	4	-	-	4	25	75	100
A1210	AC Machines - I	CE	3	1	-	4	25	75	100
A1211	Electro Magnetic Fields	CE	3	1	-	4	25	75	100
A1212	Control Systems	CE	4	-	-	4	25	75	100
A1213	DC Machines Lab	CE	-	-	3	2	25	50	75
A1214	Control Systems and Simulation 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
A1506	Object Oriented Programming through JAVA	CE	4	-	-	4	25	75	100
A1541	Soft Computing	CE	3	1	-	4	25	75	100
A1415	Integrated Circuits Applications	CE	4	-	-	4	25	75	100
A1419	Signal Analysis and Transform Techniques	CE	3	1	-	4	25	75	100
A1217	Power System Transmission and Distribution	CE	4	-	-	4	25	75	100
A1218	AC Machines - II	CE	3	1	-	4	25	75	100
A1219	AC Machines Lab	CE	-	-	3	2	25	50	75
A1422	Electronic Circuits & Integrated Circuits 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
A1015	Industrial Management and Psychology	HS	4	-	-	4	25	75	100
A1423	Micro Processors and Interfacing	CE	3	1	-	4	25	75	100
A1220	Computer Methods in Power Systems	CE	4	-	-	4	25	75	100
A1221	Electrical Measurements	CE	3	1	-	4	25	75	100
A1222	Power Electronics	CE	3	1	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE – I	HS	4	-	-	4	25	75	100
A1427	Micro Processors and Interfacing Lab	CE	-	-	3	2	25	50	75
A1223	Power Electronics and Simulation Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH – ELECTRICAL AND ELECTRONICS ENGINEERING

VII 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
A1224	Power System Switchgear and Protection	CE	4	-	-	4	25	75	100
A1225	Power System Operation and Control	CE	3	1	-	4	25	75	100
A1226	Power Semiconductor Drives	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE – II	IE	4	-	-	4	25	75	100
	PROFESSIONAL ELECTIVE – I	PE	3	1	-	4	25	75	100
A1233	Electrical Measurements Lab	CE	-	-	3	2	25	50	75
A1234	Power Systems and Simulation Lab - I	CE	-	-	3	2	25	50	75
A1235	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
A1236	Utilization of Electrical Energy	CE	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
A1249	Power Systems and Simulation Lab - II	CE	-	-	6	2	25	50	75
A1250	Technical Seminar	TS	-	-	6	2	50	-	50
A1251	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1252	Mini Project	MP	-	-	-	2	50	-	50
A1235	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
	TOTAL		09	03	24	28	250	500	750

B. TECH – ELECTRICAL AND ELECTRONICS ENGINEERING

ELECTIVES	
INTERDEPARTMENTAL ELECTIVE - I	
Code	**Subject**
A1511	Database Management Systems
A1606	Wireless and Mobile Computing
A1429	VLSI Design
A1337	Robotics
A1701	Introduction to Aircraft Industry
A1148	Air pollution and Control Methodologies
INTERDEPARTMENTAL ELECTIVE - II	
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
PROFESSIONAL ELECTIVE - I	
A1227	High Voltage Engineering
A1228	Energy Management
A1229	Linear System Analysis
A1230	Instrumentation
A1231	Special Electrical Machines
A1232	Power System Transients
PROFESSIONAL ELECTIVE - II	
A1237	Electrical Distribution Systems
A1238	High Voltage DC Transmission and FACTS
A1239	Power Quality
A1240	Advanced Control Systems
A1241	Dynamics of Electrical Machines
A1242	Advanced Power System Protection
PROFESSIONAL ELECTIVE - III	
A1243	Reliability Engineering
A1244	Digital Control Systems
A1245	Extra High Voltage AC Transmission
A1246	Machine Modeling and Analysis
A1247	Solar Energy and its Applications
A1248	Programmable Logic Controllers

B. TECH - MECHANICAL ENGINEERING

REGULATIONS: VCE-R11A

I SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1001	Mathematics - I	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
A1501	Computer Programming	BE	4	-	-	4	25	75	100
A1202	Basic Electrical and Electronics Engineering	BE	3	1	-	4	25	75	100
A1502	Computer Programming Lab	BE	-	-	3	2	25	50	75
A1010	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A1303	Engineering Drawing	BE	-	-	6	2	25	75	100
TOTAL			**18**	**02**	**12**	**26**	**200**	**550**	**750**

II SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1008	Technical English	HS	4	-	-	4	25	75	100
A1006	Computational Techniques	BS	3	1	-	4	25	75	100
A1007	Mathematics - II	BS	3	1	-	4	25	75	100
A1004	Environmental Science	BS	4	-	-	4	25	75	100
A1301	Engineering Mechanics	BE	4	-	-	4	25	75	100
A1009	English Language Communication Skills Lab	HS	-	-	3	2	25	50	75
A1302	Engineering Workshop	BE	-	-	3	2	25	50	75
A1304	Advanced Engineering Drawing	BE	-	-	6	2	25	75	100
TOTAL			**18**	**02**	**12**	**26**	**200**	**550**	**750**

III SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				**Scheme of Examination Maximum Marks**		
A1503	Data Structures through C	BE	4	-	-	4	25	75	100
A1306	Mechanics of Solids	CE	3	1	-	4	25	75	100
A1307	Mechanics of Fluids	CE	4	-	-	4	25	75	100
A1308	Thermodynamics	CE	3	1	-	4	25	75	100
A1309	Metallurgy and Material Science	CE	3	1	-	4	25	75	100
A1310	Machine Drawing	CE	-	-	6	4	25	75	100
A1504	Data Structures through C lab	BE	-	-	3	2	25	50	75
A1311	MOS/MMS Lab	CE	-	-	3	2	25	50	75
TOTAL			**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - MECHANICAL ENGINEERING

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1014	Probability and Statistics	BS	3	1	-	4	25	75	100
A1215	Electrical Technology	BE	4	-	-	4	25	75	100
A1312	Thermal Engineering - I	CE	3	1	-	4	25	75	100
A1313	Production Technology	CE	4	-	-	4	25	75	100
A1314	Hydraulic Machinery and Systems	CE	4	-	-	4	25	75	100
A1315	Kinematics of Machinery	CE	3	1	-	4	25	75	100
A1216	Electrical and Electronics Engineering Lab	BE	-	-	3	2	25	50	75
A1316	Fluid Mechanics and Hydraulic Machinery 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
A1013	Managerial Economics and Financial Analysis	HS	4	-	-	4	25	75	100
A1317	Dynamics of Machinery	CE	3	1	-	4	25	75	100
A1318	Machine Tools	CE	4	-	-	4	25	75	100
A1319	Thermal Engineering - II	CE	3	1	-	4	25	75	100
A1320	Design of Machine members - I	CE	3	1	-	4	25	75	100
A1321	Metrology and Surface Engineering	CE	4	-	-	4	25	75	100
A1322	Thermal Engineering Lab	CE	-	-	3	2	25	50	75
A1323	Production Technology 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
A1015	Industrial Management and Psychology	HS	4	-	-	4	25	75	100
A1324	Production Planning and Control	CE	3	1	-	4	25	75	100
A1325	Design of Machine Members - II	CE	3	1	-	4	25	75	100
A1326	Heat Transfer	CE	4	-	-	4	25	75	100
A1327	Finite Element Methods	CE	3	1	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - I	HS	4	-	-	4	25	75	100
A1328	Heat Transfer Lab	CE	-	-	3	2	25	50	75
A1329	Metrology and Machine Tools Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - MECHANICAL ENGINEERING

REGULATIONS: VCE-R11A

VII SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				Scheme of Examination Maximum Marks		
A1330	Operations Research	CE	4	-	-	4	25	75	100
A1331	CAD/CAM	CE	3	1	-	4	25	75	100
A1332	Instrumentation and Control Systems	CE	4	-	-	4	25	75	100
A1333	Refrigeration and Air Conditioning	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - II	IE	4	-	-	4	25	75	100
	PROFESSIONAL ELECTIVE - I	PE	3	1	-	4	25	75	100
A1340	CAD Lab	CE	-	-	3	2	25	50	75
A1341	Production Drawing and Instrumentation Lab	CE	-	-	3	2	25	50	75
A1342	Project Work (Stage - I)	PW	-	2	-	-	-	-	-
	TOTAL		**22**	**04**	**06**	**28**	**200**	**550**	**750**

VIII SEMESTER

Code	Subject	Category	L	T	P	Credits	Internal	External	Total
			Periods per Week				Scheme of Examination Maximum Marks		
A1343	Power Plant Engineering	CE	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
A1356	CAM Lab	CE	-	-	6	2	25	50	75
A1357	Technical Seminar	CE	-	-	6	2	50	-	50
A1358	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1359	Mini Project	MP	-	-	-	2	50	-	50
A1342	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
	TOTAL		**09**	**03**	**24**	**28**	**250**	**500**	**750**

B. TECH - MECHANICAL ENGINEERING

ELECTIVES	
INTERDEPARTMENTALAL ELECTIVE - I	
Code	**Subject**
A1511	Database Management Systems
A1611	Image Processing
A1453	Digital Electronics and Microprocessors
A1228	Energy Management
A1735	Fatigue and Fracture Mechanics
A1148	Air Pollution and Control Methods
INTERDEPARTMENTALAL ELECTIVE – II	
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
PROFESSIONAL ELECTIVE - I	
A1334	Automobile Engineering
A1335	Rapid Prototyping
A1336	Mechatronics
A1337	Robotics
A1338	Composite Materials
A1339	Un Conventional Machining Process
PROFESSIONAL ELECTIVE - II	
A1344	Nano Technology
A1345	Plant Engineering and Industrial Safety
A1346	Computational Fluid Dynamics
A1347	Automation in Manufacturing
A1348	Reliability Engineering
A1349	NDT Techniques
PROFESSIONAL ELECTIVE - III	
A1350	Concurrent Engineering
A1351	Mechanical Vibrations
A1352	Total Quality Management
A1353	Non Conventional Sources of Energy
A1354	Tribology
A1355	Advanced IC Engines

B. TECH - AERONAUTICAL ENGINEERING

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
A1004	Environmental Science	BS	4	-	-	4	25	75	100
A1005	Probability, Statistics and Computational Techniques	BS	3	1	-	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
A1303	Engineering Drawing	BE	-	-	6	2	25	75	100
	TOTAL		**18**	**02**	**12**	**26**	**200**	**550**	**750**

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
A1202	Basic Electrical and Electronics Engineering	BE	3	1	-	4	25	75	100
A1301	Engineering Mechanics	BE	4	-	-	4	25	75	100
A1010	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A1302	Engineering Workshop	BE	-	-	3	2	25	50	75
A1304	Advanced Engineering Drawing	BE	-	-	6	2	25	75	100
	TOTAL		**18**	**02**	**12**	**26**	**200**	**550**	**750**

III SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1012	Mathematics for Aerospace Engineers	BS	4	-	-	4	25	75	100
A1013	Managerial Economics and Financial Analysis	HS	4	-	-	4	25	75	100
A1701	Introduction to Aircraft Industry	CE	4	-	-	4	25	75	100
A1306	Mechanics of Solids	CE	3	1	-	4	25	75	100
A1307	Mechanics of Fluids	CE	3	1	-	4	25	75	100
A1308	Thermodynamics	CE	3	1	-	4	25	75	100
A1702	Mechanics of solids Lab	BE	-	-	3	2	25	50	75
A1703	Mechanics of Fluids Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - AERONAUTICAL ENGINEERING

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1215	Electrical Technology	BE	4	-	-	4	25	75	100
A1704	Aerodynamics-I	CE	4	-	-	4	25	75	100
A1705	Aircraft Production Technology	CE	4	-	-	4	25	75	100
A1706	Aerospace Vehicle Structures-I	CE	3	1	-	4	25	75	100
A1707	Flight Mechanics-I	CE	3	1	-	4	25	75	100
A1708	Mechanisms and Mechanical Design	CE	3	1	-	4	25	75	100
A1216	Electrical and Electronics Engineering Lab	CE	-	-	3	2	25	50	75
A1709	Computer Aided Aircraft Engineering Drawing 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
A1710	Air Transportation Systems	CE	4	-	-	4	25	75	100
A1711	Aerospace Propulsion - I	CE	4	-	-	4	25	75	100
A1712	Aerodynamics - II	CE	3	1	-	4	25	75	100
A1713	Flight mechanics - II	CE	3	1	-	4	25	75	100
A1714	Aerospace Vehicle Structures - II	CE	3	1	-	4	25	75	100
A1715	Introduction to Space Technology	CE	4	-	-	4	25	75	100
A1716	Aircraft Production Technology Lab	CE	-	-	3	2	25	50	75
A1717	Aerospace Vehicle Structures 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
A1212	Control Systems	CE	3	1	-	4	25	75	100
A1330	Operations Research	HS	4	-	-	4	25	75	100
A1718	Aerospace Propulsion - II	CE	4	-	-	4	25	75	100
A1719	Flight Vehicle Design	CE	3	1	-	4	25	75	100
A1720	Finite Element Modeling and Analysis	CE	3	1	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - I	HS	4	-	-	4	25	75	100
A1721	Flight Vehicle Design and Simulation Lab	CE	-	-	3	2	25	50	75
A1722	Aerodynamics and Propulsion Lab	CE	-	-	3	2	25	50	75
	TOTAL		21	03	06	28	200	550	750

B. TECH - AERONAUTICAL ENGINEERING

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1326	Heat Transfer	CE	4	-	-	4	25	75	100
A1723	Computational Fluid Dynamics	CE	4	-	-	4	25	75	100
A1724	Vibrations and structural Dynamics	CE	3	1	-	4	25	75	100
A1725	Avionics	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE - II	IE	4	-	-	4	25	75	100
	PROFESSIONAL ELECTIVE - I	PE	3	1	-	4	25	75	100
A1731	Computer Aided Aircraft Modeling and Assembly Lab	CE	-	-	3	2	25	50	75
A1732	Heat Transfer and CFD Lab	CE	-	-	3	2	25	50	75
A1733	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
A1734	Aircraft systems and Instrumentation	CE	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
A1747	Computational Analysis of Aircraft Structures Lab	CE	-	-	6	2	25	50	75
A1748	Technical Seminar	TS	-	-	6	2	50	-	50
A1749	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1750	Mini project	MP	-	-	-	2	50	-	50
A1733	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
	TOTAL		**09**	**03**	**24**	**28**	**250**	**500**	**750**

B. TECH - AERONAUTICAL ENGINEERING

ELECTIVES	
INTERDEPARTMENTAL ELECTIVE - I	
Code	**Subject**
A1148	Air Pollution and Control Methodologies
A1441	Satellite and Radar Communications
A1453	Digital Electronics and Microprocessors
A1331	CAD/CAM
A1337	Robotics
A1338	Composite Materials
INTERDEPARTMENTAL ELECTIVE – II	
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
PROFESSIONAL ELECTIVE - I	
A1726	Space Mechanics
A1727	Aero Elasticity
A1728	Fatigue and Fracture Mechanics
A1344	Nano Technology
A1729	Boundary Layer Theory
A1730	Experimental Stress Analysis
PROFESSIONAL ELECTIVE - II	
A1735	Advanced Computational Fluid dynamics
A1736	Industrial Aerodynamics
A1737	Hypersonic Aerodynamics
A1738	Airport Management
A1739	Non destructive Testing
A1740	Theory of Plates and Shells
PROFESSIONAL ELECTIVE - III	
A1741	Rockets and Missiles
A1742	Propellant Technology
A1743	Helicopter Engineering
A1744	Design of Aircraft Structures
A1745	Hydraulics and Pneumatics Systems
A1746	Air Line Management

B. TECH – CIVIL ENGINEERING

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
A1004	Environmental Science	BS	4	-	-	4	25	75	100
A1501	Computer Programming	BE	4	-	-	4	25	75	100
A1202	Basic Electrical and Electronics Engineering	BE	3	1	-	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
A1303	Engineering Drawing	BE	-	-	6	2	25	75	100
	TOTAL		18	02	12	26	200	550	750

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
A1005	Probability, Statistics and Computational Techniques	BS	3	1	-	4	25	75	100
A1301	Engineering Mechanics	BE	4	-	-	4	25	75	100
A1010	Engineering Physics and Engineering Chemistry Lab	BS	-	-	3	2	25	50	75
A1302	Engineering Workshop	BE	-	-	3	2	25	50	75
A1304	Advanced Engineering Drawing	BE	-	-	6	2	25	75	100
	TOTAL		18	02	12	26	200	550	750

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
A1307	Mechanics of Fluids	CE	3	1	-	4	25	75	100
A1101	Building Materials and Construction	CE	3	1	-	4	25	75	100
A1102	Surveying – I	CE	3	1	-	4	25	75	100
A1103	Strength of Materials – I	CE	4	-	-	4	25	75	100
A1104	Concrete Technology	CE	4	-	-	4	25	75	100
A1105	Strength of Materials Lab	CE	-	-	3	2	25	50	75
A1106	Surveying – I Lab	CE	-	-	3	2	25	50	75
	TOTAL		21	03	06	28	200	550	750

B. TECH - CIVIL ENGINEERING

REGULATIONS: VCE-R11A

IV SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1215	Electrical Technology	BE	3	1	-	4	25	75	100
A1107	Strength of Materials-II	CE	3	1	-	4	25	75	100
A1108	Structural Analysis – I	CE	3	1	-	4	25	75	100
A1109	Hydraulics and Hydraulic Machines	CE	4	-	-	4	25	75	100
A1110	Building Planning and Drawing	CE	4	-	-	4	25	75	100
A1111	Surveying – II	CE	4	-	-	4	25	75	100
A1112	Fluid Mechanics and Hydraulic Machinery Lab	CE	-	-	3	2	25	50	75
A1113	Surveying – II 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
A1114	Design of Reinforced Concrete Structure	CE	3	1	-	4	25	75	100
A1115	Geo Technical Engineering-I	CE	4	-	-	4	25	75	100
A1116	Water Resources Engineering-I	CE	4	-	-	4	25	75	100
A1117	Structural Analysis-II	CE	3	1	-	4	25	75	100
A1118	Engineering Geology	CE	4	-	-	4	25	75	100
A1119	Estimating and Costing	CE	3	1	-	4	25	75	100
A1120	Geo Technical Engineering Lab	CE	-	-	3	2	25	50	75
A1121	Engineering Geology 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
A1015	Industrial Management and Psychology	HS	4	-	-	4	25	75	100
A1122	Design of Steel Structures	CE	3	1	-	4	25	75	100
A1123	Geo Technical Engineering-II	CE	3	1	-	4	25	75	100
A1124	Water Resources Engineering - II	CE	3	1	-	4	25	75	100
A1125	Environmental Engineering-I	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE-I	HS	4	-	-	4	25	75	100
A1126	Environmental Engineering Lab	CE	-	-	3	2	25	50	75
A1127	Concrete and Highway Engineering Lab	CE	-	-	3	2	25	50	75
	TOTAL		**21**	**03**	**06**	**28**	**200**	**550**	**750**

B. TECH - CIVIL ENGINEERING

VII SEMESTER

Code	Subject	Category	Periods per Week			Credits	Scheme of Examination Maximum Marks		
			L	T	P		Internal	External	Total
A1128	Remote Sensing and GIS Applications	CE	4	-	-	4	25	75	100
A1129	Finite Elements Methods in CIVIL Engineering	CE	3	1	-	4	25	75	100
A1130	Environmental Engineering-II	CE	4	-	-	4	25	75	100
A1131	Transportation Engineering	CE	4	-	-	4	25	75	100
	INTERDEPARTMENTAL ELECTIVE – II	IE	4	-	-	4	25	75	100
	PROFESSIONAL ELECTIVE – I	PE	3	1	-	4	25	75	100
A1138	Computer Aided Drafting of Buildings Lab	CE	-	-	3	2	25	50	75
A1139	Structural Drawing (Steel and RCC)	CE	-	-	3	2	25	50	75
A1140	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
A1141	Advanced Structural Design	CE	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
A1154	Geographical Information Systems Lab	CE	-	-	6	2	25	50	75
A1155	Technical Seminar	TS	-	-	6	2	50	-	50
A1156	Comprehensive Viva	CV	-	-	-	2	-	75	75
A1157	Mini Project	MP	-	-	-	2	50	-	50
A1140	Project Work (Stage - II)	PW	-	-	12	8	50	150	200
	TOTAL		**09**	**03**	**24**	**28**	**250**	**500**	**750**

B. TECH - CIVIL ENGINEERING

ELECTIVES	
INTERDEPARTMENTAL ELECTIVE - I	
Code	**Subject**
A1611	Image Processing
A1228	Energy Management
A1710	Air Transportation Systems
A1330	Operations Research
A1503	Data Structures through C
A1453	Digital Electronics and Microprocessors
INTERDEPARTMENTAL ELECTIVE – II	
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
PROFESSIONAL ELECTIVE - I	
A1132	Design and Drawing of Hydraulic Structures
A1133	Pavement Analysis and Design
A1134	Environmental Impact Assessment Methodologies
A1135	Advanced Structural Analysis
A1136	Rehabilitation and Retrofitting Structures
A1137	Urban Planning and Information Systems
PROFESSIONAL ELECTIVE - II	
A1142	Earth Quake Resistant Design Structures
A1143	Industrial Waste and Waste Management
A1144	Ground Improvement Techniques
A1145	Urban Disaster and Intelligent Control Systems
A1146	Bridge Engineering
A1147	Multy Storeyed Structures
PROFESSIONAL ELECTIVE - III	
A1148	Air Pollution and Control Methodologies
A1149	Pre stressed Concrete Structures
A1150	Soil Dynamics And Machine Foundation
A1151	Traffic Engineering
A1152	Geoinformatics for Environmental Monitoring
A1153	Industrial Structures

SYLLABI FOR I & II SEMESTERS

MATHEMATICS – I

(I Semester: 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 $Q(x)= e^{\alpha x}$, sinax, cosax, and x^n, $e^{\alpha x}V(x)$, $x^nV(x)$, 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.

ENGINEERING PHYSICS

(I Semester: ECE / EEE / ME :: II Semester: CSE / IT / AE / CE)

Course Code: **A1002**

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L   T   P   C
4   -   -   4
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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.

ENGINEERING CHEMISTRY
(I Semester: ECE / EEE / ME :: II Semester: CSE / IT / AE / CE)

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.

ENVIRONMENTAL SCIENCE

(I Semester: CSE / IT / AE / CE :: II Semester: ECE / EEE / ME)

Course 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.

PROBABILITY, STATISTICS AND COMPUTATIONAL TECHNIQUES
(I Semester: CSE / AE :: II Semester: IT / EEE / 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.

COMPUTATIONAL TECHNIQUES

(II Semester: ECE / ME)

Course Code**: A1006**

L	T	P	C
3	1	-	4

UNIT - I

ROOTS OF NON-LINEAR EQUATIONS AND SOLUTIONS OF LINEAR EQUATIONS: Bisection method – method of false position - iteration method – newton-raphson method. Ill conditioned systems – jacobi iterative method – gauss seidel method – convergence of iterative methods.

UNIT - II

INTERPOLATION: Introduction – errors in polynomial interpolation – finite differences – forward differences - backward differences – symbolic relations and separation of symbols – difference equations – difference of a polynomial – newton's formulae for interpolation – interpolation with unequally spaced points - lagrange's interpolation formula.

UNIT - III

NUMERICAL DIFFERENTIATION & INTEGRATION AND CURVE FITTING: Numerical differentiation – trapezoidal rule - simpson's 1/3 rule – simpson's 3/8 rule. Linear, non-linear and curvilinear curve fitting – multiple linear regressions.

UNIT - IV

NUMERICAL SOLUTIONS OF INITIAL VALUE PROBLEMS IN ORDINARY DIFFERENTIAL EQUATIONS: Solution by taylor's series method – picard's method of successive approximation – euler's method and modified euler's method – runge - kutta methods. Predictor – corrector methods - adam's bashforth method.

UNIT - V

SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS: Classification of partial differential equation – finite difference methods for elliptic equations – laplace equations – liebmann's iterative methods – parabola equations – solution of one dimensional heat equation.

TEXT BOOKS:
1.	Iyengar T. K. V., Krishna Gandhi B. & Others (2011), *Numerical Methods*, First Edition, New Delhi, S. Chand & Co. Ltd.
2.	Grewal B. S (2007), *Higher Engineering Mathematics*, 40th Edition, New Delhi, Khanna Publishers.

REFERNCE BOOKS:
1.	Sastry S. S (2005), *Introductory Methods of Numerical Analysis*, 4th Edition, New Delhi, PHI Learning Pvt. Ltd.
2.	Jain M. K. and Iyengar S. R. K (2007), *Numerical Methods for Scientific and Engineering Computation*, 5th Edition, New Delhi, New Age International Publishers.
3.	Balaguruswamy. E (1999), *Numerical Methods*, New Delhi, Tata McGraw Hill Publishing Company Limited.

MATHEMATICS - II

(II Semester: 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.

TECHNICAL ENGLISH

(I Semester: CSE / IT / AE / CE :: II Semester: ECE / EEE / ME)

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.

COMPUTER PROGRAMMING

(I Semester: Common to all Branches)

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.

DATA STRUCTURES THROUGH C
(II Semester: 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.

BASIC ELECTRICAL ENGINEERING

(I Semester: IT / ECE / EEE :: II Semester: CSE)

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.

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(I Semester: ME / CE :: II Semester: AE)

Course Code: **A1202**

L	T	P	C
3	1	-	4

UNIT - I

INTRODUCTION TO ELECTRICAL ENGINEERING: Essence of electricity, conductors, semiconductors and insulators (elementary treatment only); electric field; electric current, potential and potential difference, electromotive force, electric power, ohm's law, basic circuit components, electromagnetism related laws, magnetic field due to electric current flow, force on a current carrying conductor placed in a magnetic field, faradays laws of electromagnetic induction. Types of induced EMF's, Kirchhoff's laws, simple problems.

UNIT - II

ALTERNATING QUANTITIES: Principle of AC voltages, waveforms and basic definitions, root mean square and average values of alternating currents and voltages, form factor and peak factor, phasor representation of alternating quantities, J operator and phasor algebra, analysis of AC circuits with single basic network element, single phase series circuits, single phase parallel circuits, single phase series parallel circuits, power in ac circuits.

UNIT - III

NETWORK THEOREMS: Superposition, reciprocity, thevenin's, norton's and maximum power transfer theorems with DC excitation.

INSTRUMENTS: Basic principle of indicating instruments - permanent magnet moving coil and moving iron instruments.

CATHODE RAY OSCILLOSCOPE: Principles of CRT (Cathode Ray Tube), deflection, sensitivity, electrostatic and magnetic deflection, applications of CRO - voltage, current and frequency measurements.

UNIT - IV

DIODE AND ITS CHARACTERISTICS: P-N junction diode, symbol, V-I characteristics, rectifiers - half wave, full wave and bridge rectifiers (simple Problems).

UNIT - V

TRANSISTORS: P-N-P and N-P-N junction transistor, CE, CB and CC transistor configurations.

TEXT BOOKS:
1. T. K. Nagasarkar, M. S. Suhkija (2007), Basic Electrical Engineering, 2nd Edition, Oxford University Press, New Delhi.
2. S. Salivahanan, N Suresh Kumar, A. Vallavaraj (2007), *Electronic Devices and Circuits, Tata* McGraw Hill, India.

REFERENCE BOOKS:
1. Sudhakar Shyam Mohan S P (2005), Network Analysis, 2nd Edition, Tata McGraw-Hill, New Delhi.
2. L. Thereja and A. K. Thereja (2008), A Text Book of Electrical Technology, First Edition, S. Chand & Company limited, New Delhi.
3. V. K. Mehta (2006), *Principles of Electrical Engineering and Electronics*, 2nd Edition, S. Chand & Company, New Delhi.
4. M. S. Naidu and S. Kamakshaiah (2011), Basic *Electrical Engineering*, 1st Edition, Mc Graw-Hill, New Delhi.
5. Kothari and Nagarath (2003), *Basic Electrical Engineering*, 2nd Edition, Tata Mc Graw-Hill, New Delhi.

ENGINEERING MECHANICS
(II Semester: ME / AE / CE)

Course Code: **A1301**

L	T	P	C
4	-	-	4

UNIT - I

INTRODUCTION TO ENGINEERING MECHANICS: Basic concepts, systems of forces**:** coplanar concurrent forces - components in space – resultant – moment of force and its application – couples and resultant of force systems.

EQUILIBRIUM OF SYSTEMS OF FORCES: free body diagrams, equations of equilibrium of coplanar systems and spatial systems for concurrent forces.

UNIT - II

FRICTION: Types of Friction – Limiting Friction – Laws of Friction – angle of repose, equilibrium body laying on rough inclined plane – ladder friction - wedge friction.

UNIT - III

CENTROID AND CENTER OF GRAVITY: Centroids of lines – centroids of area - centroids of composite figures theorems of pappus - centre of gravity of bodies – centroids of volumes centre of gravity of composite bodies.

UNIT - IV

AREA MOMENTS OF INERTIA: Introduction definition of moment of inertia – polar moment of inertia, radius of gyration - transfer theorems for moment of inertia – moments of inertia by integration – movements of inertia of composite figures, products of inertia, transfer formula for product of inertia.

MASS MOMENT OF INERTIA: Introduction**,** moment of inertia of masses – radius of gyration - transfer formula for mass moments of inertia – mass moments of inertia by integration - mass moment of inertia of composite bodies.

UNIT - V

VIRTUAL WORK: Introduction – principle of virtual work – applications – beams, lifting machines, simple framed structures (ladder problems).

TEXT BOOKS:
1.   Fedinand L. Singer (1998), *Engineering Mechanics*, Harper – Collins Publishers, New Delhi.
2.   S. S. Bhavikatti, J. G. Rajasekharappa (2006), *Engineering Mechanics*, New Age International, India.

REFERENCES BOOKS:
1.   Timoshenko & Young (2007), *Engineering Mechanics*, Mc Graw Hill, India.
2.   A.R. Tayal (2009), *Engineering Mechanics*, Umesh Publications, New Delhi.
3.   R.S. Khurmi (2009), *Engineering Mechanics*, S. Chand & Company Limited, New Delhi.
4.   K.L Kumar (2009), *Engineering Mechanics*, Tata Mc Graw Hill, New Delhi.
5.   Irving. H. Shames (1999), *Engineering Mechanics*, Prentice-Hall, India.

ENGINEERING DRAWING

(I Semester: ME / AE / CE)

Course Code: **A1303**

L	T	P	C
-	-	6	2

UNIT - I

INTRODUCTION TO ENGINEERING DRAWING: Principles of engineering graphics and their significance – drawing instruments and their use – conventions in drawing – lettering – BIS conventions. Dimensioning rules, geometrical construction.

SCALES: Different types of scales, plain scales, diagonal scales, comparative scales, vernier scales, scale of chords.

CURVES USED IN ENGINEERING PRACTICE AND THEIR CONSTRUCTIONS: Conic Sections, Special Curves and Involutes.

UNIT - II

DRAWING OF PROJECTIONS OR VIEWS ORTHOGRAPHIC PROJECTION IN FIRST ANGLE PROJECTION ONLY: Principles of orthographic projections – conventions – first and third angle projections.   Projections of points and lines inclined to planes, true lengths, traces, application problems.

UNIT - III

PROJECTIONS OF PLANES AND SOLIDS: Projections of regular planes, inclined to both planes. Projections of regular solids inclined to both planes.

UNIT - IV

SECTIONS AND SECTIONAL VIEWS: Right regular solids – sections of prisms, cylinders, pyramids and cones.

UNIT - V

DEVELOPMENT OF SURFACES: Development of surfaces of right, regular solids – development of prisms, cylinders, pyramids, cones and their parts.

TEXT BOOKS:

1.   N. D. Bhat (2006), *Engineering Drawing*, Charotar Publications, New Delhi.

REFERENCE BOOKS:

1.   Venugopal (2010), *Engineering Drawing and Graphics*, 2nd edition, New Age Publications, New Delhi.
2.   Johle (2009), *Engineering Drawing*, Tata Mc Graw Hill, New Delhi, India.
3.   Trymbaka Murthy (2007), *Computer Aided Engineering Drawing*, I.K. International Publishers, New Delhi.
4.   R.B. Choudary (2005), *Engineering graphics with Auto CAD*, Anuradha Publishers, New Delhi.

ADVANCED ENGINEERING DRAWING
(II Semester: ME / AE / CE)

Course Code: **A1304**

	L	T	P	C
	-	-	6	2

UNIT - I
PROJECTIONS OF PLANES: Projections of plane by auxiliary plane method, auxiliary inclined plane, auxiliary vertical plane.

PROJECTIONS OF SOLIDS: Projections of solids by auxiliary plane method, auxiliary inclined plane, auxiliary vertical plane.

UNIT - II
SECTIONS AND SECTIONAL VIEWS: Right regular solids – prism, cylinder, pyramid, cone - auxiliary views.

DEVELOPMENT AND INTERPENETRATION OF SOLIDS: Development of interpenetration of right regular solids.

UNIT - III
INTERSECTION OF SOLIDS: Intersection of cylinder vs cylinder, cylinder vs prism, cylinder vs cone, prism by another solid.

TRANSFORMATION OF PROJECTIONS: Conversion of isometric views to orthographic views –conventions.

UNIT - IV
ISOMETRIC PROJECTIONS: Principles of isometric projection - isometric scale – isometric views - conventions – isometric views of lines, plane figures, simple and compound solids – isometric projection of objects having non-isometric lines. Isometric projection of spherical parts.

UNIT - V
PERSPECTIVE PROJECTIONS: Perspective view: points, lines, plane figures and simple solids, vanishing point method and its alternative method, visual ray method and its alternative method.

AN INTRODUCTION TO COMPUTER AIDED DRAFTING: Generation of points, lines, curves, polygons, simple solids, dimensioning.

TEXT BOOKS:
1.   N. D. Bhat (2006), *Engineering Drawing*, Charotar Publications, New Delhi.

REFERENCE BOOKS:
1.   Venugopal (2010), *Engineering Drawing and Graphics*, 2nd edition, New age publications, New Delhi.
2.   Johle (2009), *Engineering Drawing*, Tata Mc Graw Hill, New Delhi, India.
3.   R.B. Choudary (2005), *Engineering graphics with Auto CAD*, Anuradha Publishers, New Delhi.

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(I Semester: CSE / IT / AE / CE :: II Semester: ECE / EEE / ME)

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.

ENGINEERING PHYSICS AND ENGINEERING CHEMISTRY LAB
(I Semester: ECE / EEE / ME :: II Semester: CSE / IT / AE / CE)

Course Code: **A1010**   L   T   P   C
                                                          -   -   3   2

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.

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

COMPUTER PROGRAMMING LAB

(I Semester: Common to all Branches)

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 $1+x+x^2+x^3+...x^n$
        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.

DATA STRUCTURES THROUGH C LAB
(II Semester: CSE / IT / ECE / EEE)

Course Code: **A1504**

L	T	P	C
-	-	3	2

Exercise 1:
Write recursive programme which computes the nth 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.

PC SOFTWARE LAB
(I Semester: ECE / IT / EEE :: II Semester: CSE)

Course Code: **A1601**

L	T	P	C
-	-	6	2

PART - A: List of Experiments on Documents Skills

1. MS Word / Latex
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.

2. MS Excel
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.

3. MS Power Point
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.

4. MS Publisher
Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages and Hosting website.

5.
Develop static User profile page for students (using only HTML) of an online web site. The pages should resemble: www.vardhaman.org so that it must be user friendly and easy to navigate.

6.
Develop static Exam Application Form (using only HTML). The pages should resemble: www.vardhaman.org so that it must be user friendly and easy to navigate.

7.
Develop static web pages (using only HTML) of an online shopping with frames. The pages should resemble: www.flipkart.com so that it must be user friendly and easy to navigate.
   a. Shopping cart
   b. Payment By credit card
   c. Order confirmation

PART - B: List of Experiments using MATLAB

8. Operators and Elementary Operations
   a. Arithmetic
   b. Relational
   c. Logical
   d. Bit-wise Operations

9. Elementary Mathematics
   a. Arithmetic - Operators, cumulative sums and products, rounding and remainder
   b. Trigonometry - Sine, cosine, and related functions, with results in radians or degrees
   c. Exponents and Logarithms - Exponential, logarithm, power and root functions
   d. Complex Numbers - Real and imaginary components, phase angles
   e. Discrete Math - Prime factors, factorials, permutations, LCM and GCD

f. Polynomials - Curve fitting, roots, partial fraction expansions
g. Special Functions - Bessel, Legendre, elliptic, error, gamma and other functions

10. Plotting Graphs both 2-D and 3-D
   a. Plotting Basics
   b. Line Plots
   c. Pie Charts, Bar Plots, and Histograms
   d. Discrete Data Plots

11. Programming Scripts and Functions
   a. Control Flow - Conditional statements, loops, branching
   b. Scripts
   c. Functions
   d. Debugging
   e. Coding and Productivity Tips
   f. Programming Utilities

PART - C: List of Experiments using MULTISIM

12. Construct simple electrical circuits - Using KCL and KVL

13. Construct simple electrical circuits - Verifying circuits using nodal and mesh analysis
   a. Circuit with only independent sources
   b. Circuits with dependent sources
   c. Star to Delta and Delta to Star Conversion

14. Analysis of AC Circuits

15. Series and Parallel Resonance

REFERENCE BOOKS:
1. C. Bates(2002), Web Programming building Internet Applications, 2nd edition, WILLEY Dream Tech, New Delhi, India.
2. Dietel and Nieto(2008), Internet and World wide Web How to Program, 4th edition, PHI/Pearson Education Asia, New Jersey.
3. Brain R. Hunt, Ronald L. Lipsman, Jonathan M. Rosenberg (2009), A Guide to MATLAB for Beginners and Experienced Users, 2nd edition, Cambridge University Press, USA.
4. John Meindel (2012), *MATLAB Language Reference Manual (LRM),* The Mathworks, India.
5. James W. Nilsson, Susan Riedel (2010), *Introduction to Multisim for Electric Circuits,* University edition, McGraw Hill, New Delhi.
6. John Reeder (2008), *Using Multisim 9: Trouble shooting DC/AC Circuits,* Oxford University Press, New Delhi.

COMPUTER AIDED ENGINEERING DRAWING LAB
(I Semester: CSE :: II Semester: ECE / IT / EEE)

Course Code: **A1305**

L T P C
- - 6 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.

ENGINEERING WORKSHOP

(II Semester: ME / AE / CE)

Course Code: **A1302**   L   T   P   C
                                                                                        -    -   3   2

1. TRADES FOR EXERCISES:
   a.   Carpentry
   b.   Fitting
   c.   House Wiring
   d.   Tin-Smithy
   e.   Foundry

2. DEMONSTRATION TRADES:
   a.   Black Smithy
   b.   Welding
   c.   Plumbing

TEXT BOOKS:
1.   H. S. Bawa (2007), *Workshop Practice,* Tata McGraw-Hill Publishing Company Limited, New Delhi.
2.   A. Rajendra Prasad & P. M. M. S. Sarma (2002), *Workshop Practice*, Sree Sai Publication, New Delhi.

REFERENCE BOOKS:
1.   K. Jeyachandran, S. Natarajan, S. Balasubramanian (2007), *A Primer on Engineering Practices Laboratory*, Anuradha Publications, New Delhi.
2.   T. Jeyapoovan, M. Saravanapandian, S. Pranitha (2006), *Engineering Practices Lab Manual*, Vikas Publishing House Private Limited, New Delhi.

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	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

	walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs 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.	not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the 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.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VISION

Our vision is to be a premier source to serve as the best platform to contribute effectively to Industry with high impact research and stand as the crème de la crème of programmes that students would aim for. Further department strives to build a strong research and teaching environment that responds swiftly to the challenges in the field of Computer Science and Engineering.

MISSION

The mission of the Department of CSE is to work closely with Industry in developing curriculum commensurate with Industry needs. It also provides high quality computer education in both the theoretical and applications of Computer Science and Engineering. The department also train the students to effectively apply coding and programming skills to solve real-world problems. It encourages original thinking, foster research and development, evolve innovative applications of technology, encourage entrepreneurship through effective teaching and learning.

DEPARTMENT OF INFORMATION TECHNOLOGY

VISION

The vision of the Department of Information Technology is to evolve as a center of academic excellence in providing globally standard education and research in the field of Information Technology and to mould young graduates into competitive, innovative, self disciplined and visionary computer professionals while maintaining a commitment to diversity and humanity.

MISSION

Our mission is to provide strong academic program in a state-of-the-art environment to advance theoretical, experimental, and applied computer science through universally recognized research by faculty and students, that prepares graduates for flexible career paths as computer scientists in industry, government and academia and continuing advancement in computing and to support society by participating in and encouraging technology transfer.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

VISION

The department of ECE will become a centre of world class excellence in Electronics and Communication Engineering. It will periodically refresh to reflect the cutting edge technologies of the industry in the global market. The vision of the department is to produce creative engineers those who can address the global challenges and excel at an International level.

MISSION

The mission of the department of ECE is to provide the students an environment of academic freedom that will insure the exchange of ideas and the dissemination of knowledge in this discipline through effective teaching. It infuses the scientific temper in the students towards the research in Electronics and communication engineering. It strives to establish incubation centres for research in Micro electronics, Embedded Systems, Communications and Signal Processing with an offer for consultancy services to industries.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION

The vision of the Electrical and Electronics Engineering department is to build a research identity in all related areas of Electrical Engineering uniquely. Through core research and education, the students will be prepared as the best professional Engineers in the field of Electrical Engineering to face the challenges in such disciplines.

MISSION

The Electrical and Electronics Engineering Department supports the mission of the College through high quality teaching, research and services that provide students a supportive environment .The department will make the best effort to promote intellectual, ethical and technological environment to the students. The department invokes the desire and ability of life-long learning in the students for pursuing successful career in engineering.

DEPARTMENT OF MECHANICAL ENGINEERING

VISION

The department of Mechanical Engineering will become a world class center of innovation for its outstanding education, research, and outreach programs. It will serve as the premier source of well-qualified engineers, who are innovative, entrepreneurial and successful in advanced fields of Mechanical Engineering and research.

MISSION

The mission of the department of Mechanical Engineering is to provide high standards of technical education through effective teaching, innovative curricula, and research training that reflect the changing needs of global market. The department also encourages the students to apply engineering principles with utmost professional ethics to solve Mechanical Engineering problems effectively and serve the society. It maintains state-of-the-art research facilities to provide its students and faculty with opportunities to create, interpret, apply and disseminate knowledge in this discipline.

DEPARTMENT OF CIVIL ENGINEERING

VISION

The vision of the department of the Civil Engineering is to become an emerging centre of excellence in the field of civil engineering education and to produce innovators and integrators of ideas and technology for discovering a practical reality in what was once just imagined.

MISSION

The mission of the department of civil engineering is to integrate industry with institution to synergize the efforts for facilitating the advancement of technology to enhance quality, knowledge, competitiveness, sustainability and environmental steward ship. The department also strives to produce highly energetic, enthusiastic and ethical civil engineering graduates by imparting strong basic and advanced professional skill sets to redefine and reshape the destiny of future society.