

VIDYA JYOTHI INSTITUTE OF TECHNOLOGY

An Autonomous Institution

Aziznagar Gate, C.B. Post, Hyderabad - 500 075, Telangana.



ACADEMIC REGULATIONS (R15)

for

B.Tech Four Year Degree Programme

(Applicable for the batches admitted from the Academic Year 2017-2018 onwards)

Definitions of Key Words:

Academic Year: An academic year is referred as the period consisting of two consecutive semesters with 16 weeks each of instructional period followed by both the semester exams.

Course: A plan of study of a particular subject leading to an examination. All the courses need not carry the same weight. A course may be designed to comprise of lectures/ tutorials/ laboratory work/ field work/ outreach activities/ project work/ vocational training/ viva/ seminars/ assignments/ presentations etc. or a combination of some of these.

Choice Based Credit System (CBCS): Choice Based Credit System (CBCS) is the programme in which the students have a choice to choose from the prescribed courses and can learn at their own pace and the entire assessment is graded-based on a credit system.

Credit Point: It is the product of Grade Point and Number of Credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/ field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student of all the semesters. The CGPA is the ratio of total credit points secured by a student in various courses in all semesters and the sum of the total credits of all courses in all the semesters. It is expressed up to 2nd decimal place.

Grade Point: It is a numerical weight allotted to each letter Grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course.

Grades are denoted by letters O, A+, A, B+, B, C, P and F.

Programme: An Educational Programme leading to the award of a Degree.

Semester: Each semester will consist of 16-18 weeks of academic work equivalent to 90 actual teaching days.

Semester Grade Point Average (SGPA): It is a measure of performance of the work done by the student in a semester. It is the ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It shall be expressed up to 2nd decimal place.

Transcript or Grade Card or Certificate: Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Types of Courses: The Courses in under B.Tech, program may be of three kind's viz., Core, Elective and Mandatory.

a) Core Course:-

There may be a Core Course in every semester, and are to be compulsorily studied by a student and is essential requirement for a given Programme.

b) Elective Course:-

Elective Course is a course which can be chosen by the students from a pool of subjects. In general, the elective course is,

- Supportive to the discipline of study
 - Providing an expanded scope of the course subjects
 - Nurturing student's proficiency/skill/Research.
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- In case an elective is "Discipline centric" and is offered by the student's department itself, the elective is called **Professional elective**.
 - On the other hand, if the elective is offered by the other departments or if the choice is given to the students to choose from other disciplines, the elective is called an "**Open Elective**."

c) Mandatory Courses (Non-Credit Courses)

AICTE considers that the Course work of certain subjects is essential and as such for the award of a B.Tech degree a pass in these subjects is made mandatory. Therefore, such types of courses are referred as **mandatory courses**. As the AICTE also feels that only a familiarity with the subject content of these courses is essential, only a pass in each of these courses is required. Therefore, these subjects are included in the curriculum as non-Credit courses.

ACADEMIC REGULATIONS FOR B. TECH. (REGULAR)

Applicable for the students of B. Tech. (Regular) from the Academic Year 2015-16 onwards.

1. Courses of Study:

The following Four year Bachelor of Technology (B.Tech.) Programmes under Choice Based Credit System (CBCS) are offered with effect from the Academic Year 2015-16 onwards:

S. No.	Branch	Branch Code
I	Civil Engineering	01
II	Electrical and Electronics Engineering	02
III	Mechanical Engineering	03
IV	Electronics and Communication Engineering	04
V	Computer Science and Engineering	05
VI	Information Technology	12

2. Admission Procedure

- 2.1. Admissions will be done as per the norms prescribed by the Government of Telangana State.
- 2.2. The Government orders with regard to the admissions in vogue shall prevail.
- 2.3. The candidate should have passed the prescribed qualifying examination on the date of Admission.

3. Award of B. Tech. Degree

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

- 3.1 The candidate shall register for 192 credits and secure all the 192 credits by securing a minimum CGPA of 5.0.
- 3.2 The external examination in all the subjects shall be conducted at the end of each semester for all the eight semesters.
- 3.3 Students joining the B.Tech. Programme shall have to complete the programme within 8 years from the year of joining. Similarly, the students joining the B.Tech. Programme in the third semester directly through Lateral Entry Scheme (LES) shall have to complete the programme within 6 years from the year of joining otherwise they shall forfeit they will not be permitted to pursue their studies nor will be allowed to write the exams.

4. Course Structure:

- 4.1 The course shall be of four Academic year's duration, each academic year having two semesters. Each semester shall have a minimum **16** weeks of instruction, with a minimum of **90** Instructional Days per Semester.

4.2 Credits:

Credits shall be assigned to each Subject/ Courses in a L: T: P: C (Lecture Periods: Tutorial Periods: Practical Periods: Credits) Structure, based on the following general pattern.

Type of course		Clock hour/week			
		L	T	P	C
Theory	1)	04	01	-	0
	2)	03	01	-	0
	3)	02	01	-	0
Practical		0	0	03	0
Drawing	1)	0	04	-	0
	2)	02	02	-	0
	3)	00	06	-	0
Mini project, Comprehensive Viva Voce Seminar, Major project		-	-	-	1 6

5. Attendance Requirements

- 5.1 A student is eligible to write the Semester End examinations only if he / she acquire a minimum of 75% of attendance in aggregate of all the subjects/Courses in that Semester.
- 5.2 Condonation for the shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds with a documentary evidence approved by the Academic Committee.
- 5.3 A stipulated fee shall be payable towards condonation of attendance shortage.
- 5.4 Students, whose shortage of attendance is not condoned, are not eligible to write semester end examinations of that semester. Such students are detained and their registration for the examination stands cancelled.
- 5.5 A student detained due to shortage of attendance in a semester may seek re-admission into that semester, as and when offered, within four weeks from the date of the commencement of class work with the academic regulations of the batch into which he/she gets admitted.
- 5.6 A student will be promoted to the next semester if he/she satisfies the attendance requirement of the present semester.
- 5.7 For all mandatory, non credit courses offered in a semester, a "Satisfactory Participation Certificate" shall be issued to the student, only after securing 75% attendance in such course. Letter Grade shall be allotted for these courses.

The courses offered in 8 semesters spread over 4 years have been classified into 8 categories under CBCS.

S. No.	Subject categories	No. of Credits
1	Humanities and Social Sciences (HS) Subjects, English, Management and the courses dealing with personality development	15
2	Basic Sciences (BS) Subjects including Mathematics, Physics and Chemistry	30
3	Engineering Sciences (ES), Engg. Workshop, Drawing, Fundamentals of computer Science and courses dealing with the basics of Electrical / Electronics/ Mechanical engineering	30
4	Professional Core (PC) Subjects, Courses dealing with the concerned engineering branch	81
5	Professional Elective (PE) Subjects. The students opt electives offered by the department	12
6	Open Elective (OE) Subjects. Courses offered by the other braches representing technically important subjects from emerging areas.	9
7	Project Work, Seminar and/ or Internship in Industry or elsewhere along with mini project.	10+2+3 =15
8	Mandatory Courses (MC)	nil
Total Number of credits		192

B.Tech Year wise distribution of credits under CBCS

S.No.	Year	Semester	Credits	Total
1	1 st Year	I	25	48
		II	23	
2	2 nd Year	I	24	48
		II	24	
3	3 rd Year	I	24	48
		II	24	
4	4 th Year	I	24	48
		II	24	
Total No. of Credits				192

6. Promotion regulations

- 6.1 A student shall be promoted from B.Tech., I Year to II Year only if he/she fulfills the academic requirements of securing 50% of total credits (24 credits out of 48 credits, upto I year II Semester), from all the examinations, whether or not the candidate takes the examinations.
- 6.2 A student shall be promoted from B.Tech., II Year to III Year only if he/she fulfills the academic requirements of securing 50% of total credits (48 out of 96 credits, up to II year II semester, from all the examinations, whether or not the candidate takes the examinations.
- 6.3 A student shall be promoted from B.Tech., III year to IV year only if he/she fulfills the academic requirements of securing 50% of total credits (72 out of 144 credits) up to III year II semester), from all the examinations, whether or not the candidate takes the examinations.

7. Minimum Academic Requirements

The following minimum academic requirements are to be satisfied in addition to the requirements mentioned in item no.5.

- 7.1 A student shall be deemed to have satisfied the minimum academic requirements and has earned the credits allotted to each theory/practical/design/drawing subject/project and secured not less than 35% marks in Semester End Examination (SEE), and minimum 40% of marks in the sum total of the internal evaluation and end examination taken together.
- 7.2 The student has to pass the failed course by appearing the supplementary examination as per the requirement for the award of degree.
- 7.3 Students, who fail to earn 192 credits as indicated in the course structure within eight academic years from the year of their admission, shall forfeit their seat in B. Tech. course and their admission stands cancelled.
- 7.4 A student shall register and put up minimum Attendance and earn all 192 Credits for the award of degree.
- 7.5 When a student is detained due to shortage of attendance in any semester, no Grade allotments or SGPA/CGPA calculations will be done for that entire Semester in which a student got detained.
- 7.6 When a Student is detained due to lack of Credits in any year, he may be readmitted after fulfillment of the Academic Requirements, with the Academic Regulations of the Batch into which he gets readmitted for readmitted candidates. If there are any Professional Electives / Open Electives, the same may also be re-registered if offered. However, if those Electives are not offered in later Semesters, then alternate Electives may be chosen from the SAME set of Elective Subjects offered under that category.

7.7 After securing 192 Credits as specified for the successful completion of the entire UGP, an exemption of 6 Credits (two subjects with 3 credits each) may be permitted to drop resulting in 186 Credits for UGP performance evaluation. Accordingly, the performance of student in 186 Credits shall be taken into account for the calculation of 'the final CGPA and shall be indicated in the Grade Card. However, the student's performances in the earlier individual Semesters, with the corresponding SGPA for which already Grade Cards are given, will not be altered. Further, the optional drop out for such 6 Credits shall not be allowed for i) Laboratory courses, ii) Industrial Training/ Mini-Project, iii) Seminar, iv) Major Project v) Open electives.

7.8 A student is eligible to appear in the End Semester Examination in any Subject / Course, but absent at it or failed (thereby failing to secure P Grade or above), may reappear for that subject /Course at the supplementary exam as and when the examinations are conducted. In such cases, his Continuous Internal Evaluation(CIE) assessed earlier for that subject/Course will be carried over, and added to the marks to be obtained in the supplementary examinations, for evaluating the performance in that subject.

7.9 A student with a final CGPA (at the end of the UGP) < 5.00 will not be eligible for the Award of the Degree.

8 Evaluation - Distribution and weightage of Marks

8.1 The performance of a student in each semester shall be evaluated Subject-wise (irrespective of Credits assigned) for a maximum of 100 marks for Theory or Seminar or Drawing/Design or Industry Oriented Mini-Project or Minor Course, etc. For Practical's a maximum of 75 Marks shall be evaluated. However the B. Tech. Project work (Major Project) will be evaluated for 200 Marks. These evaluations shall be based on 25% CIE (Continuous Internal Evaluation) and 75% SEE (Semester End Examinations) and a Letter Grade corresponding to the % marks obtained shall be given.

8.2 For theory subjects the distribution shall be 25 marks for Continuous Internal Evaluation (CIE) and 75 marks for the Semester End- Examination (SEE).

8.3 For theory subjects, during the semester there shall be 2 midterm examinations. Each midterm examination will be conducted for 20 marks and consists of Part-A (Short Answer Questions) for 6 marks and Part-B (Long Answer Questions) for 14 marks with duration of 90 Minutes. First midterm examination shall be conducted for 2.5 units of syllabus and second midterm Examination shall be conducted for remaining 2.5 units. The Average marks secured by a student in I and II Midterm examination are considered and shall be taken as the final marks secured by the student towards Continuous Internal Evaluation in the theory subject.

8.4 In case a few students are absent due to health reasons or any other unavoidable circumstances, or if the performance of some of the students is very poor, all such cases will be referred to a standing committee consisting of the Controller of examinations (Chairman), HoD of the concerned dept. and the Academic coordinator. On the recommendation of the committee, a makeup test will be conducted on payment of fee fixed by the examination branch.

- 85 In order to improve the attendance and to encourage the students who are regular to the college, 5 marks in each subject will be given to the students as per the percentage of attendance shown in the table,

Table: - Marks for attendance

S.No	Percentage of attendance	Marks to be awarded
1.	Less than 75%	nil
2.	75% to 80%	3
3.	80% to 85%	4
4.	85% and above	5

- 86 The Semester End Examination will be conducted for 75 marks which consist of two parts viz. i). Part-A for 25 marks, ii). Part –B for 50 marks. Part-A is compulsory, which consists of ten questions (numbered from 1 to 10) two from each unit carrying 2/3 marks each. Part-B consists of five questions (numbered from 11 to 15) carrying 10 marks each. Each of these questions is from one unit and may contain sub-questions. For each question there will be an “either” “or” choice (i.e., there will be two questions from each unit and the student should answer any one question).
- 87 For practical subjects there shall be a continuous evaluation during the Semester for 25 marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the concerned laboratory teacher.
- 88 The Practical End Semester Examination shall be conducted with an external examiner and the laboratory teacher for 50 marks. The external examiner shall be appointed by the Principal from the panel of examiners recommended by Chairman, Board of Studies in respective Branches.
- 89 For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, and Machine Drawing), the distribution shall be 25 marks for Internal Evaluation (5 marks for day-to-day work and 20 marks for internal tests) and 50 marks for Semester End Examination. There shall be one internal test in a semester and shall be considered for the award of marks for internal test.
- 8.10. There shall be an industry-oriented mini-Project, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated in IV year I Semester at the time of practical exams. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, Head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

8.11. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding of the topic, and submit it to the department. It shall be evaluated by the departmental committee consisting of Head of the Department, Seminar Supervisor and a Senior Faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for the seminar.

8.12 . There shall be a Comprehensive Viva-Voce in IV year II semester. The 'Comprehensive Viva-Voce will be conducted by a committee consisting of Head of the Department and two Senior Faculty members of the department and is evaluated for 100 marks. The Comprehensive Viva-Voce is intended to assess the students understanding of the subjects he studied during the B. Tech. course. There will be no External Examiner for the Comprehensive Viva-Voce.

8.13 . Out of a total of 200 marks for the major project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester evaluation. The End Semester evaluation (viva-voce) shall be conducted by committee. The committee consists of an external examiner, Head of the Department, the supervisor of project and a senior faculty member of the department. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year II Semester. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his project.

8.14 . The Laboratory marks and the sessional marks awarded by the faculty are subject to scrutiny by the Institution whenever/wherever necessary. In such cases, the sessional and laboratory marks awarded by the teacher will be referred to a College Academic Committee. The Committee will arrive at a scaling factor and the marks will be scaled accordingly. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved as per the University rules and produced before the Committees of the University as and when asked for.

8.15 Candidates shall be permitted to apply for recounting/revaluation of SEE scripts within the stipulated period with payment of prescribed fee.

9.0. Malpractice Rules

S.No.	Nature of Malpractices / Improper conduct during examinations	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	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	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.
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 practical's 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 Semester end 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 Semester end 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	Cancellation of the performance in that subject.
6	Refuses to obey the orders of the Chief Superintendent / Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs 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	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the 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 & 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 Semester examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with

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 a student of the college, who is not a candidate for the particular examination or any person not connected with the examination or college indulges in any type of malpractice or improper conduct mentioned in clauses 6 to 8.	Student of the college will be expelled from the examination hall and cancellation of the performance in that subject and all other subjects. If the candidate has already appeared including practical examinations and project work 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
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 head of Institute for further action for a suitable punishment.	

All the cases pertaining to malpractices in examinations will be referred to a committee constituted by the Chief Controller of Examination and the committee will suggest action as per the guidelines mentioned above.

10. Grading Procedure:

10.1. Marks will be awarded to indicate the performance of each student in each theory subject, or Lab/Practical, or Seminar, or Project, or Mini-Project, Minor Course etc., based on the % marks obtained in CIE+SEE(Continuous Internal Evaluation + Semester End Examination, both taken together) as specified, and a corresponding Letter Grade shall be given.

10.2. As a measure of the student's performance, a 10-point Absolute Grading System using the following Letter Grades and corresponding percentage of marks shall be followed.

Letter Grade	Performance	Grade Points	% of marks Secured (Class Intervals)
O	Outstanding	10	Greater than or equal to 90%
A+	Excellent	9	80% and less than 90%
A	Very Good	8	70% and less than 80%
B+	Good	7	60% and less than 70%
B	Average	6	50% and less than 60%
C	Pass	5	40% and less than 50%
F	Fail	0	Below 40%
Ab	Absent	0	Absent

10.3. A student obtaining F Grade in any subject shall be considered 'Failed' and will be required to reappear as 'Supplementary Candidate' in the end Semester Examination (SEE), as and when offered. In such cases; his Internal Marks (CIE Marks) in those Subject(s) will remain same as those he obtained earlier.

10.4. A Letter Grade does not imply any specific % of Marks.

10.5. In general, a student shall not be permitted to repeat any Subject/Course (s) only for the sake of 'Grade Improvement' or 'SGPA/CGPA Improvement'. However, he has to repeat all the Subjects/Courses pertaining to that Semester, when he is detained.

10.6. A student earns Grade Point (GP) in each Subject/ Course, on the basis of the Letter Grade obtained by him in that Subject/ Course (excluding Mandatory non-credit Courses). Then the corresponding 'Credit Points' (CP) are computed by multiplying the Grade Point with Credits for that particular Subject/ course. Credit Points (CP) = Grade Point (GP) x Credits for a Course.

10.7. The Student passes the Subject/ Course only when he gets $GP \geq 4$ (P Grade or above).

11. Registration/Dropping

11.1. Each student has to compulsorily register for course work at the beginning of each semester as per the schedule mentioned in the academic calendar. It is absolutely necessary for the student to register for courses in time.

11.2. The student has to register for a minimum of 20 credits and may register up to a maximum of 28 credits based on the advice of the Faculty Advisor. On an average, a student is expected to register for 24 credits.

11.3. A student at the end of II year II semester either having CGPA of ≥ 7.0 or having passed all previous courses in the first attempt with a minimum SGPA ≥ 5.0 is allowed to register for an additional course/ credits from the offered open electives.

- 11.4. A series of open Electives will be offered to the students of III year I & II sems. and IV year I sem., which can be registered by the students as and when the notifications are issued at the end of II year II sem. and III year II sem. Prior permission for registration of open Electives as an additional course is compulsory.
- 11.5. A student would be allowed to register for an additional course only if he/she satisfies the prerequisites.
- 11.6. Departments will notify at the time of registration about the minimum number of students to be enrolled for a particular open elective to be offered.
- 11.7. Any student may be barred from registering for any course for specific reasons like disciplinary reasons or any other activities carried out by a student, which detrimental to the discipline of the college.
- 11.8. Dropping of Courses: Within four weeks after the commencement of the semester, the student may, in consultation with his / her faculty advisor, drop one or more courses without prejudice to the minimum number of credits. The dropped courses are not recorded in the Grade Card.
- 11.9. After Dropping, minimum credits registered shall be 20.

12. Earning of Credits

A student shall be considered to have completed a Course successfully and earned the credits if he/she secures an acceptable letter grade in the range 'O' to 'P'. Letter grade 'F' in any Course implies failure of the student in that Course and no credits earned.

13. Passing Standards:

- 13.1. A student shall be declared successful or 'passed' in a Semester, only when he gets a SGPA ≥ 5.00 (at the end of that particular Semester); and a student shall be declared successful or 'passed' in the entire UGP, only when he/she gets a CGPA ≥ 5.00 ; subject to the condition that he secures a GP ≥ 4 (P Grade or above) in every registered Subject/ Course in each Semester (during the entire UGP) for the Degree Award, as required.
- 13.2. (i) In spite of securing P Grade or above in some (or all) Subjects/ Courses in any Semester, if a Student receives a SGPA < 5.00 and/ or CGPA < 5.00 at the end of such a Semester, then he 'may be allowed' (on the 'specific recommendations' of the Head of the Department and subsequent approval from the Principal) to be promoted to the next year in the course.
- (ii) If a student gets P grade or an SGPA is less than 5, is eligible to re appear for one or more of the same Subject(s)/ course(s) in which he has secured P Grade(s) in that Semester, at the Supplementary Examinations to be held in the next subsequent Semester(s). In such cases, his Internal Marks (CIE Marks) in those Subject(s) will remain same as those obtained earlier. In these considerations, the newly secured Letter Grades will be recorded and taken into account for calculation of SGPA and CGPA, only if there is an improvement.

13.3. A Student shall be declared successful or 'passed' in any Non-Credit Subject/ Course, if he secures a 40% marks or **P** grade in the end sem exam conducted by the college along with the other examinations.

13.4. After the completion of each Semester, a Grade Card or Grade Sheet (or Transcript) shall be issued to all the registered students of that semester, indicating the Letter Grades and Credits earned. It will show the details of the courses registered (Course Code, Title, No. of Credits, Grade Earned etc.), Credits earned, SGPA, and CGPA.

14. Eligibility for the award of B.Tech. Degree

A student shall be eligible for award of the B.Tech degree if he/she fulfils all the following Conditions:

14.1. The students should successfully complete all the components prescribed in the Programme of study to which he/ she is admitted.

14.2. The student should also obtain CGPA greater than or equal to 5.0.

14.3. Not having any pending disciplinary action.

15. Evaluating of Grade Point Averages:

15.1. SGPA and CGPA the *credit index* can be used further for calculating the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA), both of which being important performance indices of the student. While SGPA is equal to the *credit index* for a semester divided by the total number of *credits* registered by the student in that semester, CGPA gives the sum total of *credit indices* of all the previous semesters divided by the total number of *credits* registered in all these semesters. Thus, The Grade Point Average (GPA) will be calculated according to the formula:

$$GPA = \frac{\sum C_i G_i}{\sum C_i}$$

where C_i = number of credits for the course i ,

G_i = grade points obtained by the student in the course.

15.2. Semester Grade Point Average (SGPA) is awarded to candidates considering all the courses of the semester. Zero grade points are also included in this computation. SGPA is rounded off to TWO Decimal Places.

SGPA will be computed as follows;

$\sum [(Course\ credits) \times (Grade\ points)]$ (for all Courses passed in that semester)

 $\sum [(Course\ credits)]$ (for all courses registered in that semester)

15.3. To arrive at Cumulative Grade Point Average (CGPA), the formula is used considering the student's performance in all the courses taken in all the semesters completed up to the particular point of time. CGPA is rounded off to TWO Decimal Places.

CGPA will be computed as follows:

$$\sum [(Course\ credits) \times (Grade\ points)] \text{ (for all Courses passed up to that semester)}$$

$$\sum [(Course\ credits)] \text{ (for all Courses registered until that semester)}$$

CGPA is thus computed from the I Year First Semester onwards, at the end of each Semester, as per the above formula. However, the SGPA of I year I Semester itself may be taken as the CGPA, as there are no cumulative effects.

15.4. Illustrative Example:

An illustrative example given in below Table below indicates the use of the above two equations in calculating SGPA and CGPA, both of which facilitate the declaration of academic performance of a student, at the end of a semester and at the end of successive semesters respectively. Both of them shall be normally calculated up to the second decimal position, so that the CGPA, in particular, can be made use of in rank ordering the student's performance in a class. If two students get the same CGPA, the tie should be resolved by considering the number of times a student has obtained higher SGPA; But, if it is not resolved even at this stage, the number of times a student has obtained higher grades like O, A, B etc shall be taken into account in rank ordering of the students in a class.

Year and Semester	Course No.	Credits	Grade	Grade Points	Credit Points
I Year I sem	XX101	5	A	8	40
I Year I sem	XX102	4	F	0	00
I Year I sem	XX103	3	A+	9	27
I Year I sem	XX104	4	F	0	00
I Year I sem	XX105	5	C	5	25
I Year I sem	XX106	5	P	4	20
Total		26(18*)			112
SGPA = 112/26 = 4.31		CGPA = 4.31			
I Year II Sem	XX107	5	B+	7	35
I Year II Sem	XX108	4	A	8	32
I Year II Sem	XX109	3	C	5	15
I Year II Sem	XX110	5	P	4	20
I Year II Sem	XX111	4	A+	9	36
I Year II Sem	XX112	2	F	0	00
I Year II Sem	Xx113	2	A	8	16
Total		25(23*)			154
SGPA = 154/25 = 6.16		CGPA = 266/51 = 5.22			

*Total No. of credits excluding those with 'F'; this is particularly important to keep track of the number of credits earned by a student up to any semester.

16. Award of Class

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

CGPA	Class Awarded	From the CGPA secured from 192 credits
≥ 8.00	First Class with Distinction	
$\geq 6.50 - < 8.00$	First Class	
$\geq 5.50 - < 6.50$	Second Class	
$\geq 5.00 - < 5.50$	Pass Class	

16.2. The marks obtained in Internal Evaluation (IE) and Semester End Examination (SEE) will be shown in the memorandum of marks.

16.3. For the purpose of awarding first Class with Distinction (CGPA ≥ 8.0), the student must obtain the minimum required CGPA within 4 academic years or within 3 academic years in case of Lateral Entry candidates by clearing all the courses.

16.4. Candidates detained/ prevented from writing the semester end examinations due to any reason in any semester are not eligible for the award of First Class with Distinction. Such candidate's even if the CGPA ≥ 8.0 shall be placed in first class.

16.5. For the purpose of awarding First, Second and Pass Class, CGPA obtained in the examinations appeared within the maximum period allowed for the completion of course shall be considered as per the regulations.

16.6. A student with final CGPA (at the end of the UGP) < 5.00 will not be eligible for the award of the Degree.

16.7. The CGPA can be converted to equivalent percentage of marks by using the equation,
 $\% \text{ of Marks} = (\text{CGPA} - 0.5) \times 10$

17. Consolidated Grade Card

A consolidated grade card containing credits & grades obtained by the candidates will be issued after completion of the four years B. Tech Programme.

18. Withholding of Results

If a student is having any indiscipline related issues pending, the result of the student will be withheld and will not be allowed to move into the next semester. His/ her degree will be withheld in such cases and the matter will be referred to the academic council for final decision.

19. Transitory Regulations

19.1. Discontinued, detained for attendance, detained for want of credits, or failed students are eligible for readmission as and when the course is offered during the subsequent academic year as per the college admission procedures.

19.2. Students on transfer from a non- autonomous or from an autonomous college shall complete all the courses of the concerned programme not covered in the earlier organization. However, he/she should take the remaining courses in the programme along with the other students.

19.3. There shall be no branch transfers after the cutoff date of admissions made in the B.Tech. I year.

20. Transcripts

After successful completion of the total programme of study, a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee.

21. Supplementary Examinations

In addition to the Regular end semester examinations, Supplementary Examinations for the previous semesters will be conducted along with end sem. Examinations. A student can appear for any number of supplementary examinations till he/she clears all courses which he/she could not clear in the first attempt. However the maximum stipulated period cannot be relaxed under any circumstances.

22. Graduation Ceremony

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

23.3. The College shall institute Prizes and Awards to meritorious students, for being given away annually at the Graduation Ceremony.

24. Termination from the Program

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

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

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

25. Non-Credit Courses (Mandatory Courses)

25.2. Requirement of 75% attendance as per the college regulations is compulsory for completing the mandatory courses.

25.3. Specified number of Mandatory Courses among the designated ones is compulsory requirement for all the students for the award of B.Tech. Degree.

25.4. Although these courses do not carry any credits, performance in these subjects is evaluated following the procedure adopted for other subjects with the same marks. However, their performance will be indicated in the student's memo of marks as Satisfactory/ Unsatisfactory.

25.5. Although mandatory courses are Non-Credit Course, all the students should secure a minimum of 40% marks in the end sem. exam conducted by the college along with the other examinations for the award of B.Tech., degree.

26. Amendments

The Academic regulations here under 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.

27. General

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

27.3. The academic regulation should be read as a whole for the purpose of an interpretation.

27.4. In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Academic Council is final.

27.5. The college may change the academic regulations, course structure & syllabi at any time.

ACADEMIC REGULATIONS FOR B. TECH. (LATERAL ENTRY STUDENTS)

Applicable for the students admitted into II year B. Tech. (Lateral Entry Scheme) from the Academic Year 2016-17 and onwards.

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

- 1.1 The LES candidates shall pursue a course of study for not less than three academic years and not more than six academic years.
- 1.2 The candidate shall register for 144 credits and secure 144 credits by securing a minimum CGPA of 5.0 from the exams. of B.Tech. II to IV year for the award of B.Tech. Degree.
- 1.3 The students, who fail to fulfill the requirement for the award of the degree in six Academic years from the year of admission, shall forfeit their seats. The attendance regulations of B. Tech. (Regular) shall be applicable to B.Tech.(LES).

1. Promotion Rule

- 2.1. A student shall be promoted from B.Tech., II Year to III Year if he/she gets at least a minimum of 24 out of 48 credits, up to II year II semester, from all the examinations, whether or not the candidate takes the examinations.
- 2.2. A student shall be promoted from III year to IV year if he/she gets a minimum of 48 out of 96 credits, up to III year II semester, from all the examinations, whether or not the candidate takes the examinations.
- 2.3. A student shall register and put up minimum attendance in all 144 credits and earn all 144 credits to be eligible for the award of B.Tech degree.
- 2.4. A student, who fails to earn 144 credits as indicated in the course structure within six academic years, shall forfeit his/her admission in B.Tech. Course.

3. Award of Class

A student, who satisfies all the requirements prescribed for the completion of the B.Tech. program, is eligible for the award of the said degree, in any one of the following four classes:

CGPA	Class Awarded	From the CGPA secured from 144 credits
≥8.00	First Class with Distinction	
≥6.50 - <8.00	First Class	
≥5.50 - <6.50	Second Class	
≥5.00 - <5.50	Pass Class	

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

5. The malpractice rules and procedures for evaluating the SGPA and CGPA mentioned under points 9 - 27, are also applicable to the later entry students.

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Part – B

Course Structure & Syllabi of

B.Tech., II Year I Semester

Academic Calendar of II/III B.Tech (I & II Sem.) for the Academic Year, 2017-18

II/III YEAR I SEMESTER		Commencement of Class Work 12-06-2017	
	From	To	Duration
Registrations	12.06.2017	17.06.2017	1 Week
I Spell of Instruction	19.06.2017	14.08.2017	8 Weeks
I Mid Examinations	16.08.2017	19.08.2017	4 Days
II Spell of Instruction	21.08.2017	23.09.2017	5 Weeks
Dussehra Holidays	24.09.2017	02.10.2017	10 Days
II Spell of Instruction Continuation	03.10.2017	21.10.2017	3 Weeks
II Mid Examinations	23.10.2017	26.10.2017	4 Days
Preparation & Practical Examinations	27.10.2017	04.11.2017	10 Days
III Mid Examinations (Lateral Entry/ Re-Admitted/Betterment)	06.11.2017	09.11.2017	4 Days
End Semester Examinations	13.11.2017	25.11.2017	2 Weeks
Supply Exams	27.11.2017	09.12.2017	2 Weeks
II YEAR II SEMESTER		Commencement of Class Work 11-12-2017	
I Spell of Instruction	11.12.2017	06.02.2018	8 Weeks 3 Days
I Mid Examinations	07.02.2018	10.02.2018	4 Days
II Spell of Instruction	12.02.2018	09.04.2018	8 Weeks
II Mid Examinations	10.04.2018	13.04.2018	4 Days
Preparation and Practical Examinations	16.04.2018	21.04.2018	1 Week
End Semester Examinations	23.04.2018	05.05.2018	2 Weeks
Supplementary Examinations	07.05.2018	19.05.2018	2 Weeks
Summer Vacation	14.05.2018	09.6.2018	3 Weeks

ELECTRONICS AND COMMUNICATION ENGINEERING

II YEAR I SEMESTER

COURSE STRUCTURE

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A13012	Mathematics – IV	3	1	0	3	4	100
A13401	Electronic Devices and Circuits	3	1	0	3	4	100
A13402	Signals and Systems	4	1	0	4	4	100
A13403	Switching Theory and Logic Design	3	1	0	3	3	100
A13404	Electronic Measurements & Instruments	3	1	0	3	3	100
A13405	Probability Theory and Stochastic Processes	4	1	0	4	4	100
A13481	Electronic Devices and Circuits Lab	0	0	3	2	3	75
A13482	Basic Simulation Lab	0	0	3	2	3	75
MC-I	Mandatory Course-I	2	0	0	0	2	75
	Total	22	2	6	24	30	825

II YEAR II SEMESTER

COURSE STRUCTURE

Subject Code	Subject Name	L	T	P/D	Total Credits	Total Hours	Total Marks
A14211	Principles of Electrical Engineering	3	1	0	3	4	100
A14409	Electronic Circuit Analysis	4	1	0	4	4	100
A14410	Pulse and Digital Circuits	4	1	0	4	4	100
A14411	Electromagnetic Theory and Transmission Lines	4	1	0	4	4	100
A14412	Digital System Design	3	1	0	3	4	100
A14016	Environmental Science	2	0	0	2	4	100
A14485	ECA Lab	0	0	3	2	3	75
A14486	PDC Lab	0	0	3	2	3	75
MC-II	Mandatory Course-II	2	0	0	-	2	75
	Total	22	2	6	24	32	825

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

L – Lecture

T – Tutorial

P – Practical

D – Drawing

MATHEMATICS-IV

(SPECIAL FUNCTIONS AND FUNCTIONS OF A COMPLEX VARIABLE)

(COMMON TO EEE & ECE)

Pre Requisites: Nil**COURSE OBJECTIVES:** To learn

1. Series solutions for Legendre differential equation, analyzing the properties of Legendre polynomials.
2. Differentiation and Integration of complex valued functions.
3. Evaluation of integrals using Cauchy's integral formula.
4. Taylor's series, Maclaurin's series and Laurent's series expansions of complex functions.
5. Evaluation of integrals using residue theorem.
6. Transform a given function from z - plane to w - plane.
7. Identify the transformations like translation, magnification, rotation and reflection and inversion.
8. Properties of bilinear transformations.

COURSE OUTCOMES: After going through this course the student will be able to:

1. Identify Bessel equation and solve it under special conditions with the help of series solutions method. Also recurrence relations and orthogonality properties of Legendre polynomials.
2. Analyze the complex functions with reference to their analyticity, Integration using Cauchy's integral theorem,
3. Expansion of a given function as a Taylor's and Laurent series
4. Solving Real Definite Integrals using Cauchy's Residue Theorem.

UNIT-I**Legendre's Polynomials**

Introduction to series solution of differential equations. Legendre's Differential equation, General solution of Legendre's equation, Legendre's polynomials and their Properties: Rodrigue's formula – Recurrence relations, Generating function of Legendre's polynomials – Orthogonality.

UNIT-II**Complex Functions –Differentiation**

Complex functions and its representation on argand plane, Concepts of limit Continuity, Differentiability, Analyticity, Cauchy-Riemann conditions, Harmonic functions– Milne – Thompson method, complex potential functions, stream functions and velocity functions.

UNIT-III**Complex Integration & Complex Power series**

Complex Integration: Line integral evaluation along a path, Cauchy's integral theorem, Cauchy's integral formula – Generalized integral formula. **Complex Power series** Radius of convergence –Expansion in Taylor's series, Maclaurin's series and Laurent's series. Singular point –Isolated singular point – pole of order m – essential singularity.

UNIT-IV**Residue and Contour Integration**

Residue – Evaluation of residue by formula and by Laurent's series – Residue theorem.

Evaluation of integrals of the type:

$$(a) \int_0^{2\pi} f(\cos \theta, \sin \theta) d\theta$$

Contour Integration.

$$(b) \text{ Improper real integrals } \int_{-\infty}^{\infty} f(x) dx \quad (c) \text{ Indentation by}$$

UNIT-V

Conformal mapping

Transformation of z-plane to w-plane by a function, Conformal transformation. Standard Transformations- Translation; Magnification and rotation; inversion and reflection, Transformations like e^z , $\log z$, z^2 , and bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given.

TEXT BOOKS

1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.
3. Jain R. K., and Iyengar S. R. K (2008), Advanced Engineering Mathematics, 3rd Edition, New Delhi, Narosa Publication House.

REFERENCES

1. Complex Variables Principles and Problem Sessions By A.K.Kapoor, World Scientific Publishers
2. A Text Book Of Engineering Mathematics by N P Bali, Manesh Goyal
3. Mathematics for Engineers and Scientists, Alan Jeffrey, 6th Edit. 2013, Chapman & Hall/CRC
4. Advanced Engineering Mathematics, Michael Greenberg, Second Edition, Person Educations.
5. Schaum's Outline Series on Complex Variables

ELECTRONIC DEVICES AND CIRCUITS

L	T	P	C
3	1	0	3

Course Objectives:

This is a fundamental course, basic knowledge of which is required by all the circuit branch engineers. This course focuses:

1. To familiarize the student with the principle of operation, analysis and design of Junction diode, BJT and FET transistors and amplifier circuits.
2. To understand diode as rectifier. To study basic principle of filter circuits and various types.

Course Outcomes:

After going through this course the student will be able to:

1. Understand and Analyze the different types of diodes, operation and its characteristics
Design and analyze the DC bias circuitry of BJT and FET Design biasing circuits using diodes and transistors.
2. To analyze and design diode application circuits, amplifier circuits and oscillators employing BJT, FET devices.

UNIT -I: P-N Junction Diode:

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

Special Purpose Electronic Devices: Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode, SCR and Semiconductor Photo Diode, UJT and Characteristics

UNIT-II: Rectifiers and Filters:

The P-N junction as a Rectifier, Half wave Rectifier, Full wave Rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor Filters, Capacitor Filters, L- Section Filters, π - Section Filters, Comparison of Filters, Voltage Regulation using Zener Diode.

UNIT-III: Bipolar Junction Transistor:

The Junction Transistor, BJT Symbol, Transistor Current Components, Transistor Construction, BJT Operation, Common Base, Common Emitter and Common Collector Configurations, Comparison of CB, CE, and CC Amplifier Configurations, Transistor as an Amplifier, Limits of Operation, BJT Specifications,

BJT Small Signal Model: BJT Hybrid model, Determination of h-parameters from Transistor Characteristics, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-IV: Transistor Biasing and Stabilization:

Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in V_{be} and β , Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability,

UNIT-V: Field Effect Transistor and Biasing:

Field Effect Transistor: The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage - Volt-Ampere characteristics, FET as Voltage Variable Resistor, The JFET Small Signal Model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion modes. Biasing FET, Comparison of BJT and FET.

TEXT BOOKS:

1. Millman's Electronic Devices and Circuits – J. Millman, C.C.Halkias, and Satyabrata Jit, 2 Ed., 1998, TMH.
2. Electronic Devices and Circuits – Mohammad Rashid, Cengage Learning, 2013
3. Electronic Devices and Circuits – David A. Bell, 5 Ed, Oxford.

REFERENCES:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits – B. P. Singh, Rekha Singh, Pearson, 2Ed, 2013.
4. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.
5. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1 Ed., 2009, Wiley India Pvt. Ltd.
6. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

SIGNALS AND SYSTEMS

L T P C
4 1 0 4

Course Objectives:

This is a core subject, basic knowledge of which is required by all the engineers.

This course focuses on:

1. To get an in-depth knowledge about signals, systems and analysis of the same using various transforms.

Course Outcomes:

After going through this course the student will be able to:

1. Represent any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signum function.
2. Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.
3. Understands the principle of linear system, filter characteristics of a system and its bandwidth, the concepts of auto correlation and cross correlation and power Density Spectrum.
4. Can design a system for sampling a signal.
5. For a given system, response can be obtained using Laplace transform, properties and ROC of L.T.
6. Study the continuous and discrete signal relation and relation between F.T., L.T. & Z.T, properties, ROC of Z Transform.

UNIT-I: Signal Analysis and Fourier series

Signal Analysis: Introduction to signals, types of signals, operations on signals. Analogy between Vectors and Signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions, Mean Square Error, Closed or complete set of orthogonal functions, Orthogonality in Complex functions.

Fourier Series: Representation of Fourier series, Continuous time periodic signals, Dirichlet's conditions, Trigonometric Fourier Series and Exponential Fourier Series, Properties of Fourier Series, Complex Fourier spectrum.

UNIT-II: Fourier Transforms and Sampling

Fourier Transforms: Deriving Fourier Transform from Fourier series, Fourier Transform of arbitrary signal, Fourier Transform of standard signals, Fourier Transform of Periodic Signals, Properties of Fourier Transform, Fourier Transforms involving Impulse function and Signum function.

Sampling: Sampling theorem – Graphical and analytical proof for Band Limited Signals, Types of Sampling - Impulse Sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, Effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-III: Signal Transmission through Linear Systems:

Introduction to systems, types of systems, Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System, Transfer function of a LTI system, Filter characteristics of Linear Systems, Distortion less transmission through a system, Signal bandwidth, System bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Paley-Wiener criterion for Physical realization, Relationship between Bandwidth and Rise time.

UNIT-IV: Convolution and Correlation of Signals:

Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transforms, Cross Correlation and Auto Correlation of functions, Properties of Correlation function, Energy density spectrum, Parseval's Theorem, Power density spectrum, Relation between Auto Correlation function and Energy/Power spectral density function, Relation between Convolution and Correlation, Detection of periodic signals in the presence of Noise by Correlation, Extraction of signal from noise by filtering.

UNIT-V: Laplace Transforms and Z-Transforms

Laplace Transforms: Review of Laplace Transforms (L.T), Partial fraction expansion, Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms, Constraints on ROC for various classes of signals, Properties of L.T, Relation between L.T and F.T of a signal, Laplace Transform of certain signals using waveform synthesis.

Z-Transforms: Fundamental difference between Continuous and Discrete time signals, Discrete time signal representation using Complex exponential and Sinusoidal components, Periodicity of Discrete time signal using complex exponential signal, Concept of Z- Transform of a Discrete Sequence, Distinction between Laplace, Fourier and Z Transforms, Region of Convergence in Z-Transform, Constraints on ROC for various classes of signals, Inverse Z-transform, Properties of Z-transforms.

TEXT BOOKS:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.
3. Signals and Systems-P. Ramesh Babu,R.Anadanatarajan,Scitech pub,4th Edition

REFERENCES:

1. Signals & Systems – Sanjay Sharma,6th Revised Edition
2. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2 Ed.
3. Signals and Signals – Iyer and K. Satya Prasad, Cengage Learning
4. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
5. Introduction to Signal and System Analysis – K.Gopalan 2009, Cengage Learning.
6. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.
7. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, 3 Ed., 2004, PE.

II Year B.Tech. ECE I-Sem

SWITCHING THEORY AND LOGIC DESIGN

L	T	P	C
3	1	0	3

Course Objectives:

This course provides in-depth knowledge of switching theory and the design techniques of digital circuits, which is the basis for design of any digital circuit. The main objectives are:

1. To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.
2. To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
3. To implement simple logical operations using combinational logic circuits
4. To design combinational logic circuits, sequential logic circuits.
5. To impart to student the concepts of sequential circuits, enabling them to analyze sequential systems in terms of state machines.
6. To implement synchronous state machines using flip-flops.

Course Outcomes:

After going through this course the student will be able to:

1. Manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray and BCD.
2. Manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
3. Design and analyze small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
4. Design and analyze small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.

UNIT-I: Number System and Boolean algebra And Switching Functions:

Review of number systems, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes.

Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

UNIT-II: Minimization and Design of Combinational Circuits:

Introduction, The Minimization of switching function using theorem, The Karnaugh Map Method-Up to Five Variable Maps, Don't Care Map Entries, Tabular Method, Design of Combinational Logic: Adders, Subtractors, comparators, Multiplexers, Demultiplexers, Decoders, Encoders and Code converters, Hazards and Hazard Free Relations.

UNIT-III: Sequential Machines Fundamentals and Applications:

Introduction: Basic Architectural Distinctions between Combinational and Sequential circuits, The Binary Cell, Fundamentals of Sequential Machine Operation, Latches, Flip Flops: SR, JK, Race Around Condition in JK, JK Master Slave, D and T Type Flip Flops, Excitation Table of all Flip Flops, Design of a Clocked Flip-Flop, Timing and Triggering Consideration, Clock Skew, Conversion from one type of Flip-Flop to another.

Registers and Counters: Shift Registers, Data Transmission in Shift Registers, Operation of Shift Registers, Shift Register Configuration, Bidirectional Shift Registers, Applications of Shift Registers, Design and Operation of Ring and Twisted Ring Counter, Operation Of Asynchronous And Synchronous Counters.

UNIT-IV: Sequential Circuits-I:

Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, Synthesis of Synchronous Sequential Circuits, Serial Binary Adder, Sequence Detector, Parity-bit Generator, Design of Asynchronous Counters, Design of Synchronous Modulo N –Counters.

UNIT-V: Sequential Circuits-II:

Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.

Algorithmic State Machines: Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

1. Switching and Finite Automata Theory- ZviKohavi&Niraj K. Jha, 3rdEdition, Cambridge.
2. Digital Design-Morris Mano, MachaelCilette, Pearson Education, 2013.
3. Switching Theory and Logic Design – A Anand Kumar, PHI,2013.

REFERENCES:

1. Digital Design- Morris Mano, PHI, 3rd Edition.
2. Introduction to Switching Theory and Logic Design – Fredriac J. Hill, Gerald R. Peterson, 3rd Ed,John Wiley & Sons Inc.
3. Digital Fundamentals – A Systems Approach – Thomas L. Floyd, Pearson, 2013.
4. Digital Logic Design - Ye Brian and HoldsWorth, Elsevier
5. Fundamentals of Logic Design- Charles H. Roth, Cengage LEarning, 5th, Edition, 2004.
6. DigitalLogic Applications and Design- John M. Yarbrough, Thomson Publications, 2006.
7. Digital Logic and State Machine Design – Comer, 3rd, Oxford, 2013.

II Year B.Tech. ECE I-Sem.
ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

L T P C
3 1 0 3

Course Objectives:

1. To introduce the basic concepts related to the operation of electrical & electronic measuring instruments.
2. To understand operational and application aspects of CRO (normal and storage).
3. To analyze and apply various AC bridges for the measurements of various physical quantities minimizing errors by following proper precautions.
4. To study the principles behind various transducers and their applications in the measurement of various parameters in electrical and mechanical engineering fields.
5. To effectively integrate hardware and software for the design of computer controlled processes and/or systems.

Course Outcomes:

Upon a successful completion of this course, the student will be able to:

- Describe the fundamental concepts and principles of instrumentation.
- Explain the operations of the various instruments required in measurements.
- Apply the measurement techniques for different types of tests.
- To select specific instrument for specific measurement function.
- Understand principle of operation, working of different electronic instruments like digital multi meter, vector voltmeter.
- Learners will apply knowledge of different oscilloscopes like CRO, DSO.
- Students will understand functioning, specification, and applications of signal analysing instruments.

UNIT - I:

Block Schematics of Measuring Systems: Performance characteristics, Static characteristics, Accuracy, Precision, Resolution, Types of Errors, Gaussian Error, Root Sum Squares formula, Dynamic Characteristics, Repeatability, Reproducibility, Fidelity, Lag; Measuring Instruments: DC Voltmeters, D' Arsonval Movement, DC Current Meters, AC Voltmeters and Current Meters, Ohmmeters, Multimeters, Meter Protection, Extension of Range, True RMS Responding Voltmeters, Specifications of Instruments.

UNIT - II:

Signal Analyzers: AF, HF Wave Analyzers, Harmonic Distortion, Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers, Capacitance-Voltage Meters, Oscillators. Signal Generators: AF, RF Signal Generators, Sweep Frequency Generators, Pulse and Square wave Generators, Function Generators, Arbitrary waveform Generator, Video Signal Generators, and Specifications.

UNIT - III:

Oscilloscopes: CRT, Block Schematic of CRO, Time Base Circuits, Lissajous Figures, CRO Probes, High Frequency CRO Considerations, Delay lines, Applications: Measurement of Time, Period and Frequency Specifications.

Special Purpose Oscilloscopes: Dual Trace, Dual Beam CROs, Sampling Oscilloscopes, Storage Oscilloscopes, Digital Storage CROs.

UNIT - IV:

Transducers: Classification, Strain Gauges, Bounded, unbounded Force and Displacement Transducers, Resistance Thermometers, Hotwire Anemometers, LVDT, Thermocouples, Synchros, Special Resistance Thermometers, Digital Temperature sensing system, Piezoelectric Transducers, Variable Capacitance Transducers, Magnetostrictive Transducers.

UNIT - V:

Bridges: Wheat Stone Bridge, Kelvin Bridge, and Maxwell Bridge.

Measurement of Physical Parameters: Flow Measurement, Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure - High Pressure, Vacuum level, Temperature - Measurements, Data Acquisition Systems.

TEXTBOOKS:

1. Electronic Instrumentation: H.S.Kalsi - TMH, 2nd Edition 2004.
2. Modern Electronic Instrumentation and Measurement Techniques: A.D. Helbins, W.D. Cooper: PHI, 5th Edition, 2003.

REFERENCES:

1. Electronic Instrumentation and Measurements - David A. Bell, Oxford Univ. Press, 1997.
2. Electronic Measurements and Instrumentation: B. M. Oliver, J. M. Cage TMH Reprint.
3. Measurement Systems - Ernest O. Doebelin and Dhanesh N Manik, 6th Ed., TMH.
4. Electronic Measurements and Instrumentations by K. Lal Kishore, Pearson Education - 2010.
5. Industrial Instrumentation: T. R. Padmanabham Spiriger 2009.

PROBABILITY THEORY AND STOCHASTIC PROCESS

L T P C
4 1 0 4

Course Objectives:

The primary objective of this course is:

1. To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in signal processing and Communication Engineering.
2. To introduce students to the basic methodology of “probabilistic thinking” and to apply it to problems.
3. To understand basic concepts of probability theory and random variables, how to deal with multiple random variables, Conditional probability and conditional expectation, joint distribution and density functions.
4. Statistical Independence and mean square estimation.
5. To understand the difference between time averages and statistical averages.
6. Analysis of random process and application to the signal processing in the communication system.
7. To teach students how to apply sums and integrals to compute probabilities, means, and expectations.

Course Outcomes:

After going through this course the student will be able to:

1. Demonstrate knowledge in
 - Probability theory
 - Single and multiple random variables
 - Random processes and their characteristics
2. Analyze operations on single and multiple random variables and processes.
3. Will be able to compute:
 - Simple probabilities using an appropriate sample space.
 - Expectations from probability density functions
 - Least -square & maximum likelihood estimators for engineering problems.
 - Mean and covariance functions for simple random processes.
4. Design solutions for complex engineering problems involving random processes.

UNIT- I: Probability

Probability Introduced through Sets and Relative Frequency, Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes’ Theorem, Independent Events, Bernoulli’s trials.

Random Variable:

Definition of a Random Variable, Types of Random Variables, Conditions for a Function to be a Random Variable, Continuous, Discrete and Mixed Random Variables.

UNIT II: Distribution & Density Functions and Operations on one Random Variable:

Distribution and Density functions, and their Properties- Binomial, Poisson, Uniform, Exponential Gaussian, Rayleigh and Conditional Distribution, Methods of defining Conditional Event, Conditional Density function and its properties, problems.

Operations on One Random Variable-Expectation:

Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Chebychev's Inequality, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non monotonic Transformations of Continuous Random Variable, Transformation of a Discrete Random Variable.

UNIT III: Multiple Random Variables and Operations on Multiple Random Variables:

Vector Random Variables, Joint Distribution Function and its Properties, Joint density Function and its Properties, Marginal Distribution and density Functions and its Properties, Conditional Distribution and Density – Point Conditioning and Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, (Proof not expected). Unequal Distribution, Equal Distributions.

Operations on Multiple Random Variables:

Expected Value of a Function of Random Variables, Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, Linear Transformations of Gaussian Random Variables.

UNIT IV: Stochastic Processes- Temporal Characteristics:

The Stochastic Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second-Order and Wide-Sense Stationary, Nth Order and Strict-Sense Stationary, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-Correlation Function and its Properties, Covariance and Its Properties, Linear system Response: Mean and Mean-squared value, Autocorrelation, Cross-Correlation Functions. Gaussian Random Processes, Poisson Random Process.

UNIT V: Stochastic Processes – Spectral Characteristics:

Power Spectrum and its Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum and its Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Spectral Characteristics Of System Response: Power Density Spectrum of Response, Cross-Power Spectral Density of Input and Output of a Linear System.

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, TMH, 4th Edition, 2001.TMH.
2. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, PHI, 4th Edition, 2002.

REFERENCES:

1. Probability and random processes with stochastic processes- Mallikarjuna Reddy, Cengage Learning
2. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W.Woods, Pearson Education, 3rd Edition.
3. Probability Methods of Signal and System Analysis. George R. Cooper, Clave D. MC Gillem, Oxford,3rd Edition, 1999.
4. Statistical Theory of Communication - S.P. Eugene Xavier, New Age Publications, 2003
5. Theory of Probability and Stochastic Processes- Pradip Kumar Gosh, University Press

ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE & EEE)

L T P C
0 0 3 2

PART A: (Only for Viva-voce Examination)

Electronic Workshop Practice (In 3 Lab Sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, MOSFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
 - a. Multimeters (Analog and Digital)
 - b. Function Generator
 - c. Regulated Power Supplies
 - d. CRO.

PART B: (For Laboratory Examination – Minimum of 10 experiments)

1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Half Wave Rectifier with & without filters.
4. Full Wave Rectifier with & without filters.
5. Input & Output Characteristics of Transistor in CB Configuration and h-parameter calculations.
6. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
7. FET characteristics.
8. Lissajous patterns using CRO
9. Frequency Response of CC Amplifier.
10. Frequency Response of CE Amplifier.
11. Frequency Response of Common Source FET amplifier.
12. SCR characteristics.
13. UJT Characteristics

II Year B.Tech. ECE I-Sem

BASIC SIMULATION LAB

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1. Basic operations on Matrices
2. Generation of various signals and sequences (Periodic and A periodic), such as Unit Impulse, Unit step, square, saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operations on Signals and Sequences such as Addition, multiplication, scaling, Shifting, Folding, computation of Energy and average power.
4. Finding the Even and Odd parts of Signal/sequence and Real and imaginary parts of signal.
5. Convolution between signals and sequences.
6. Auto correlation and cross correlation between signals and sequences.
7. Verification of Linearity and Time Invariance Properties of a given continuous/Discrete system.
8. Computation of unit sample, unit step and sinusoidal responses of the given LTI system and verifying its physical reliability and stability properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.
11. Waveform synthesis using Laplace Transform.
12. Locating the Zeros and Poles and plotting the Pole-Zero maps in S plane and Z-plane for the given transfer function.
13. Generation of Guassian noise (Real and complex), Computation of its mean, M.S. value and its Skew, Kurtosis, and PSD, probability distribution function.
14. Sampling Theorem Verification.
15. Removal of noise by Autocorrelation / Cross correlation.
16. Extraction of Periodic signal masked by noise using correlation.
17. Verification of Weiner-Khinchine Relations.
- 18.** Checking a Random Process for Stationary in Wide sense.

Note: Minimum 15 experiments to be performed.

Part – C

Syllabi of

B.Tech., II Year II Semester

II Year B.Tech. ECE II-Sem
PRINCIPLES OF ELECTRICAL ENGINEERING

L T P C
3 1 0 3

Course Objectives:

This course introduces the basic concepts of transient analysis of the circuits, the basic two-port network parameters and the design analysis of the filters and attenuators and their use in the circuit theory. The emphasis of this course is laid on the basic operation of DC machines and transformers which includes DC generators and motors, Single-Phase transformers.

Course Outcomes:

After going through this course the student gets a thorough knowledge on transient analysis of circuits, filters, attenuators, the operation of DC machines and transformers, with which he/she can be able to apply the above conceptual things to real-world problems and applications.

UNIT - I:

Transient Analysis (First and Second Order Circuits): Transient response of RL, RC Series, RLC Circuits for DC excitations, Initial Conditions, Solution using Differential Equations approach and Laplace Transform Method.

UNIT - II:

Two Port Networks: Impedance Parameters, Admittance Parameters, Hybrid Parameters, Transmission (ABCD) Parameters, Conversion of one of Parameter to another, Conditions for Reciprocity and Symmetry, Inter Connection of Two Port networks in series, Parallel and Cascaded configurations, Image Parameters, Illustration problems.

UNIT - III:

Filters and Symmetrical Attenuators: Classification of Filters, Filter Network, Classification of Pass band and Stop Band, Characteristic Impedance in the Pass and Stop bands, Constant-k Low Pass Filter, High Pass Filter, m-derived T-Section, Band Pass Filter and Band Elimination filter, Illustrative problems, Symmetrical Attenuators - T-Type Attenuator, p-Type Attenuator, Bridged T-Type Attenuator, Lattice Attenuator.

UNIT - IV:

DC Machines: Principle of Operation of DC Machines, EMF equation, Types of Generators, Magnetisation and Load Characteristics of DC Generators, DC Motors, Types of DC Motors, Characteristics of DC Motors, Losses and Efficiency, Swinburne's Test, Speed control of DC Shunt Motor, Flux and Armature Voltage control methods.

UNIT - V:

Transformers and Their Performance: Principle of Operation of Single Phase Transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuit, Losses and Efficiency of Transformer and Regulation, OC and SC test(Simple Problems), Synchros, Stepper Motors.

TEXT BOOKS:

1. Electrical Circuits - A. Chakrabarthy, Dhanipat Rai & Sons.
2. Basic Concepts of Electrical Engineering - PS Subramanyam, BS Publications.

REFERENCE BOOKS:

1. Engineering Circuits Analysis - William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 7th Edition.
2. Basic Electrical Engineering - S.N. Singh PUI
3. Electrical Circuits - David A. Bell, Oxford Printing Press.
4. Electrical Circuit Analysis - K.S. Suresh Kumar, Pearson Education.

II Year B.Tech ECE II-Sem

ELECTRONIC CIRCUIT ANALYSIS

L T P C
4 0 0 4

Course Objectives:

1. To introduce circuit realizations with components such as diodes, BJTs and transistors studied earlier.
2. To give understanding of various types of amplifier circuits such as small signal, cascaded, large signal and tuned amplifiers.
3. To familiarize the Concept of feedback in amplifiers so as to differentiate between negative and positive feedback.

Course Outcomes:

After going through this course the student will be able to:

1. Design and analyze small signal amplifier circuits applying the biasing techniques learnt earlier.
2. Cascade different amplifier configurations to obtain the required overall specifications like Gain, Bandwidth, Input and Output interfacing Impedances.
3. Design and realize different classes of Power Amplifiers and tuned amplifiers useable for audio and Radio applications.
4. Utilize the Concepts of negative feedback to improve the stability of amplifiers and positive feedback to generate sustained oscillations.

UNIT – I:

Single Stage and Multi Stage Amplifiers

Single Stage Amplifiers: Classification of Amplifiers – Distortion in amplifiers, Analysis of CE, CC, and CB Amplifiers and CE Amplifier with emitter resistance, Miller's Theorem and its dual.

Multi Stage Amplifiers: Analysis of Cascaded RC Coupled amplifiers, Cascode amplifier, Darlington pair, and Different coupling schemes used in amplifiers- RC Coupled amplifiers, Transformer Coupled amplifiers and Direct Coupled amplifiers.

UNIT – II:

BJT Amplifiers and FET Amplifiers

BJT Amplifiers: Logarithms, Decibels, General frequency considerations, Frequency response of BJT amplifier – Analysis at low and high frequencies, effect of coupling and bypass capacitors, The Hybrid- π (π) – Common Emitter transistor model, CE short circuit current gain, current gain with resistive load, Single stage CE transistor amplifier response, Gain-bandwidth product, Equivalent Circuit of Emitter Follower at higher frequencies.

FET Amplifiers: Basic Concepts, Analysis of CS, CD, CG JFET Amplifiers, Common Source Amplifier with Source resistance.

UNIT –III:

Feedback Amplifiers and Oscillators

Feedback Amplifiers: Classification of amplifiers, Concepts of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Voltage series, Voltage shunt, Current series and Current shunt Feedback configurations – Simple problems.

Oscillators: Classification of oscillators, Condition for oscillations, RC-phase shift and Wien-bridge oscillators. Generalized analysis of LC oscillators- Hartley and Colpitts Oscillators, Crystal Oscillator, stability of oscillators.

UNIT – IV:

Large Signal Amplifiers:

Classification of Power Amplifiers, Class A Power Amplifier, Maximum Value of Efficiency of Class – A Amplifier, Transformer Coupled Amplifier, Class B Power Amplifier, Efficiency of Class B Amplifier, Push Pull and Complimentary Symmetry Class B and Class AB Power Amplifiers – Principle of operation of class – C Amplifier, Distortion in power amplifiers, Transistor Power Dissipation, Heat Sinks.

UNIT – V:

Tuned Amplifiers

Introduction, Q-Factor, Small Signal Tuned Amplifiers with coupling techniques, Effect of Cascading single Tuned amplifiers on Bandwidth, Effect of Cascading Double Tuned amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned amplifiers'

TEXT BOOKS:

1. Integrated Electronics, Jacob Millman, Christos C Halkias, TMH
2. Electronic Devices and Circuits, David A. Bell – 5th Editions, Oxford.
3. Electronic Devices and Circuits, S. Salivahanan, N.Suresh Kumar, AVallvaraj, 2nd Edition, TMH.

REFERENCES:

1. Introductory Electronic Devices and Circuits (Conventional flow version) – Robert T. Paynter, 7th Edition, 2009, PEI.
2. Microelectronic Circuits – Sedra / Smith – 5th Edition – Oxford, 2009
3. Electronic Circuit Analysis – K. Lal Kishore, BS Publications, 2004.
4. Electronic Devices and Circuits, Anil.K. Maini, Varsha Agrawal, 1st Edition, WILEY.
5. Electronic Devices and Circuit Theory, Robert L.Boylestad, Louis Nashelsky, 9th Edition, Pearson Education.

PULSE AND DIGITAL CIRCUITS

L T P C
4 1 0 4

Course Objectives:

1. To understand the concepts of wave shaping and switching characteristics of diodes and transistors.
2. To analyze clippers and clampers.
3. To analyze and design different types of multivibrators
4. To analyze time base generators, sampling gates
5. To analyze and design various digital circuits.

Course Outcomes:

After going through this course the student will be able to:

1. Understand the applications of diode as integrator, differentiator, clippers, clamper circuits.
2. Learn various switching devices such as diode, transistor, SCR.
3. Difference between logic gates and sampling gates.
4. Design multivibrators for various applications, synchronization techniques and sweep circuits.
5. Realizing logic gates using diodes and transistors.

UNIT - I

Linear Wave Shaping

High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square, and ramp inputs. High pass RC circuit as differentiator and Low pass RC circuit as integrator, attenuators, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT II

Non-Linear Wave Shaping

Diode clippers, Transistor clippers, clipping at two independent levels, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, Clamping circuit theorem, clamping circuits taking source and diode resistances into account, practical clamping circuits, effect of diode characteristics on clamping voltage, synchronized clampers.

UNIT III

Switching Characteristics of Devices

Diode as a switch, piece wise linear characteristics of diode, Diode Switching Times, temperature variation of saturation parameters, design of transistor as a switch, transistor-switching times, and transistor in saturation.

Sampling Gates

Basic operating principles of sampling gates, Unidirectional diode gate, Bi-directional sampling gates using transistors, Reduction of pedestal in gate circuit, four diode sampling gate, an alternate form of four diode gate, Applications of sampling gates.

UNIT IV

Multi vibrators

Analysis and design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors.

Time Base Generators

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators, methods of linearity improvements.

UNIT V

Synchronization and Frequency Division

Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, Monostable relaxation circuits.

Logic Families:

Realization of Logic Gates (OR, AND, NOT) Using Diodes & Transistors, DCTL, RTL, DTL, TTL, ECL logic families, Characteristics of Logic families and comparison of logic families.

TEXT BOOKS:

1. Jacob Millman, Herbert Taub and Mothiki S. Prakash Rao, Millman's Pulse, Digital and Switching Waveforms, Tata McGraw-Hill, 3rd Edition, 2008.
2. David A. Bell, Solidstate pulse circuits, PHI, 4TH Edition, 2002.

REFERENCES:

1. A. Anand Kumar, Pulse and Digital Circuits, 2005, PHI.
2. Motheki S. Prakash Rao, Pulse and Digital Circuits, TMH, 2006.

ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

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Course Objectives:

1. To introduce the student to the fundamental theory and concept of electromagnetic waves and transmission lines, and their practical applications.
2. To study the propagation, reflection, and transmission of plane waves in bounded unbounded media.

Course Outcomes:

After going through this course the student will be able to:

1. Study time varying Maxwell's equations and their applications in electromagnetic problems.
2. Determine the relationship between time varying electric and magnetic fields and electromotive force.
3. Analyze basic transmission line parameters in phasor domain.
4. Use Maxwell equations to describe the propagation of electromagnetic waves in vacuum.
5. Show how waves propagate in Dielectrics and lossy media.
6. Demonstrate the reflection and refraction of waves at boundaries.

UNIT - I:

Electrostatics:

Coulomb's Law, Electric Field Intensity - Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems, Convection and Conduction Current, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance - Parallel plate, Coaxial, Spherical Capacitors, Illustrative Problems.

UNIT - II:

Magnetostatics:

Biot - Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductance and Magnetic Energy, Illustrative Problem. Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary Surface: Dielectric - Dielectric and Dielectric - Conductor Interfaces, Illustrative Problems.

UNIT - III:

EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves - Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics - Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, Illustrative Problems.

EM Wave Characteristics - II: Reflection and Refraction of Plane Waves - Normal and Oblique Incidence for both perfect Conductor and perfect Dielectric, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem - Applications, Power Loss in a Plane Conductor., Illustrative Problems.

UNIT - IV:

Transmission Lines - I: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristics Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion - Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.

UNIT - V:

Transmission Lines - II: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuits Elements; $\lambda/4$, $\lambda/2$, $\lambda/8$ Lines - Impedance Transformations, Significance of Z_{min} and Z_{max} , Smith Chart - Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

TEXT BOOKS:

1. Elements of Electromagnetic - Matthew N. O. Sadiku, 4th, Oxford Univ. Press.
2. Electromagnetic Waves and Radiating Systems - E.C. Jordan and K. G. Balmain, 2nd Ed., 2000, PHI.
3. Transmission Lines and Networks - Umesh Sinha, Satya prakashan, 2001, (Tech. India Publications), New Delhi.

REFERENCES:

1. Engineering Electromagnetics - Nathan Ida, 2nd Ed., 2005, Springer (India) Pvt. Ltd., New Delhi.
2. Engineering Electromagnetics - William H. Hay Jr. and John A. Buck, 7thEd., 2006, TMH.
3. Electromagnetics Fields Theory and Transmission Lines - G. Sashibhushana Rao, Wiley India, 2013.
4. Networks, Lines and Fields - John D. Ryder, 2nd Ed., 1999, PHI.

II Year B.Tech. ECE II-Sem
DIGITAL SYSTEM DESIGN

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Course Objectives:

This course teaches:

- Designing digital circuits, behaviour and RTL modelling of digital circuits using verilog HDL, verifying these Models and synthesizing RTL models to standard cell libraries and FPGAs.
- Students aim practical experience by designing, modelling, implementing and verifying several digital circuits.

This course aims to provide students with the understanding of the different technologies related to HDLs, construct, compile and execute Verilog HDL programs using provided software tools. Design digital components and circuits that are testable, reusable, and synthesizable.

Course Outcomes:

By the end of this course, students should be able to:

- Describe Verilog hardware description, languages (HDL).
- Design digital circuits.
- Write Behavioural models of digital circuits.
- Write Register Transfer Level (RTL) models of Digital Circuits.
- Verify Behavioural and RTL models.
- Describe standard cell libraries and FPGAs
- Synthesize RTL models to standard cell libraries and FPGAs
- Implement RTL models on FPGAs and Testing and Verification

UNIT - I:

Introduction to Verilog HDL: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Function Verification, System Tasks, Programming Language Interface, Module, Simulation and Synthesis Tools

Language Constructs and Conventions: Introduction, Keywords, Identifiers, White Space, Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars and Vectors, Parameters, Operators.

UNIT - II:

Gate Level Modelling: Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tristate Gates, Array of Instances of Primitives, Design of Flip-Flops with Gate Primitives, Delay, Strengths and Construction Resolution, Net Types, Design of Basic Circuit.

Modelling at Dataflow Level: Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vector, Operators.

UNIT - III:

Behavioural Modelling: Introduction, Operations and Assignments, Functional Bifurcation, 'Initial' Construct, Assignments with Delays, 'Wait' Construct, Multiple Always Block, Design at Behavioural Level, Blocking and Non-Blocking Assignments, The 'Case' Statement, Simulation Flow, 'If' an 'if-Else' Constructs, 'Assign- De-Assign' Constructs, 'Repeat' Construct, for loop, 'The Disable' Construct, 'While Loop', Forever Loop, Parallel Blocks, Force-Release, Construct, Event.

UNIT - IV:

Switch Level Modelling: Basic Transistor Switches, CMOS Switches, Bidirectional Gates, Time Delays with Switch Primitives, Instantiation with 'Strengths' and 'Delays' Strength Contention with Trireg Nets.

System Tasks, Functions and Compiler Directives: Parameters, Path Delays, Module Parameters. System Tasks and Functions, File Based Tasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.

UNIT - V:

Sequential Circuit Description: Sequential Models - Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis.

Components Test and Verification: Test Bench - Combinational Circuits Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

TEXT BOOKS:

1. T.R. Padmanabhan, B Bala Tripura Sundari, Design through Verilog HDL, Wiley 2009.
2. ZainalabdienNavabi, Verliog Digital System Design, TMH, 2nd Edition.

REFERENCE BOOKS:

1. Fundamentals of Digital Logic with Verilog Design - Stephen Brown, Zvonkoc Vranesic, TMH, 2nd Edition.
2. Advanced Digital Logic Design using Verilog, State Machines & Synthesis for FPGA - Sunggu Lee, Cengage Learning, 2012.
3. Verilog HDL - Samir Palnitkar, 2nd Edition, Pearson Education, 2009.
4. Advanced Digital Design with Verilog HDL - Michel D. Ciletti, PHI, 2009.

ENVIRONMENTAL SCIENCE

(Common to all Branches)

Course Objectives

- Develop an understanding on the importance of environmental protection.
- Understanding the significance of ecological balance for sustainable development.
- The ability to apply quantitative reasoning and practical skills to environmental problems.

Course Outcomes:

At the end of the course, the student will be able to:

- Understand the importance of Ecosystem and its Resources.
- Be aware on the Variety of Living organism and the need to conserve them.
- Understand the impacts of Developmental Activities.
- Understand the Environmental Policies, Management Plan and Regulations.
- Sensitize on a Sustainable Future.

UNIT I:**ECOSYSTEMS:**

Definition, Scope and Importance of ecosystem; Classification of ecosystems, Structure and Functions of ecosystem: Food chains, Food Web and Ecological Pyramids, Flow of energy; Bioaccumulation and Biomagnifications; Ecosystem Value services and Carrying Capacity.

BIODIVERSITY AND BIOTIC RESOURCES: Introduction, Definition, levels of Biodiversity, Value of biodiversity, Hot spots of biodiversity, Threats to biodiversity, conservation of biodiversity: In-Situ and Ex-situ conservation.

UNIT II:

NATURAL RESOURCES: Classification of Resources, **Water resources:** use and over utilization of surface and ground water, Floods and Droughts, Dams: benefits and problems. **Energy resources:** growing energy needs, Renewable Energy Sources – Solar, Hydro-Power, Wind, Tidal, Geo-Thermal, Biomass, Bio-fuels, Hydrogen as a fuel and Biogas and Non Renewable Energy – Coal, Petroleum, LPG, Natural Gas, SNG, CNG. **Land resources:** land as a resource, land degradation – Landslide and Soil Erosion; **Forest Resources – Uses and Exploitation.**

UNIT III:

ENVIRONMENTAL POLLUTION AND CONTROL: Types of Pollution, Sources, Effects and Control measures and Quality Standards for

1. Air Pollution
2. Water Pollution
3. Soil Pollution
4. Noise Pollution

Solid, Hazardous, Biomedical and e-Waste Management and Handling Rules, Nuclear Hazards – Case Studies. **Waste water treatment methods:** Effluent treatment plants (ETP), Sewage treatment plants (STP), Common and combined effluent treatment plants (CETP).

UNIT IV:

GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate change and their impacts on human environment; Ozone depletion and Ozone depleting substances (ODS); Acid Rains, Deforestation and Desertification. **ENVIRONMENTAL IMPACT ASSESSMENT (EIA):** Definition of Impact: classification of impacts, Methods of baseline data acquisition. Impacts on different environmental components; Environmental Impact Statement (EIS). Environmental Management Plan (EMP) - Rain Water Harvesting, Water Shed Management and Bioremediation.

UNIT V:

ENVIRONMENTAL POLICY, LEGISLATION, RULES AND REGULATIONS: Environmental Protection act, Legal aspects Air (Prevention and Control of pollution) Act- 1981, Water (Prevention and Control of pollution) Act-1974, Forest Conservation Act, Wildlife Act 1972.

TOWARDS SUSTAINABLE FUTURE: Concept of Sustainable Development, Threats to Sustainability: Population and its explosion, Crazy Consumerism, Over-exploitation of resources; Environmental Education, Role of Civil Societies, Role of IT in Environment, Smart Cities, Concept of Green Building, Low Carbon Lifestyle, Life cycle assessment and Ecological Foot Print.

TEXT BOOKS:

1. Text Book of Environmental Studies by Anubha Kaushik (4th Edition), New age International Publishers.
2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press.
3. Environmental studies, From crisis to cure by R.Rajagopalan, 2005

REFERENCE BOOKS:

1. Environmental Science: Towards a Sustainable Future by Richard T. Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environmental Science by Daniel B. Botkin & Edward A. Keller, Willey INDIA Edition.
3. Text book of Environmental Science and Technology by M.Anji Reddy 2007

II Year B.Tech. ECE II-Sem
ELECTRONIC CIRCUITS ANALYSIS LAB

L T P C
0 0 3 2

SOFTWARE (Minimum eight experiments to be conducted)

1. Common Emitter Amplifier
2. Common Collector Amplifier
3. Common Source Amplifier
4. Two Stage RC Coupled Amplifier
5. Current Shunt And Voltage Series Feedback Amplifier
6. Cascade Amplifier
7. Wien Bridge Oscillator Using Transistors
8. RC Phase Shift Oscillator Using Transistors
9. Class A Power Amplifier (Transformer Less)
10. Class B Complementary Symmetry Amplifier
11. Common Base (BJT)/ Common Gate (JFET) Amplifier

HARDWARE (Minimum five experiments to be conducted)

1. Class A Power Amplifier (With Transformer Load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitt's Oscillators
5. Darlington Pair
6. MOS Amplifier

PULSE AND DIGITAL CIRCUITS LAB

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List of Experiments: Minimum eight experiments to be performed.

1. Linear Wave Shaping
 - a. RC Low Pass Circuit for different time constants
 - b. RC High Pass Circuit for different time constants

2. Non-linear wave shaping
 - a. Transfer characteristics and response of Clippers:
 - i) Shunt and Series Clippers.
 - ii) Clipping at two independent levels.
 - b. The steady state output waveform of clampers for a square wave input
 - i) Positive Clampers.
 - ii) Negative Clampers.

3. Switching characteristics of transistor
4. Design a Bistable Multi vibrator and draw its waveforms
5. Design an Astable Multi vibrator and draw its waveforms
6. Design a Monostable Multi vibrator and draw its waveforms
7. Response of Schmitt Trigger circuit for loop gain less than and greater one
8. UJT relaxation oscillator
9. The output – voltage waveform of Boot strap sweep circuit
10. The output – voltage waveform of Miller sweep circuit

Part – D

Syllabi of

MANDATORY COURSES

INTELLECTUAL PROPERTY RIGHTS AND CYBER LAWS

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Course Objectives:

1. To make students familiar with Intellectual Property Rights.
2. To understand innovations in engineering and other domains.
3. To be familiar with patents, copyrights and various acts related to innovations.

UNIT - I:

Introduction to Intellectual property Rights (IPR):

Introduction, Types of Intellectual Property Rights, International Organizations, Agencies and Treaties, Importance of Intellectual Property Rights.

UNIT - II:

Trade Marks:

Purpose And Function Of Trademarks, Acquisition Of Trade Mark Rights, Protectable Matter, Selecting And Evaluating Trade Mark, Trade Mark Registration Processes.

UNIT - III:

Copy rights Law:

Fundamental Of Copy Right Law, Originality Of Material, Rights Of Reproduction, Rights To Perform The Work Publicly, Copy Right Ownership Issues, Copy Right Registration, Notice Of Copy Right, International Copy Right Law.

Patents Law:

Foundation of Patent Law, Patent Searching Process, Ownership Rights And Transfer

UNIT - IV:

Trade Secrets:

Trade Secrete Law, Determination Of Trade Secrets Status, Liability For Misappropriations Of Trade Secrets, Protection For Submission, Trade Secret Litigation.

Unfair competition: Misappropriation Right Of Publicity, False Advertising.

UNIT - V:

Cyber Law:

Cyber Crime, Information Security, Cyber Criminals, Classification Of Cyber Criminals- Legal Perspectives- Indian Perspectives- Cyber Crimes And Indian ITA 2000, Global Perspective On Cyber Crime- Cyber Crime Era.

Course Outcomes:

Upon completion of the course, the students are expected to:

1. To define various terms related to Intellectual Property Rights.
2. To understand the process of patent, copyrights and related procedures.
3. To analyse the situation of IPR in the Indian context with that of global scenario.
4. To understand the patenting process through various case studies.

TEXT BOOKS & REFERENCES:

1. Deborah, E. Bo Choux, Intellectual Property Right, Cengage Learning
2. Prabuddha Ganguli, Intellectual Property Right - Unleashing The Knowledge Economy, Tata Mc Graw Hill Publishing Company Ltd.,
3. Nina Godbole and Sunitha Belapure, "Cyber Security" Wiley India 2012.

PROFESSIONAL ETHICS, HUMAN VALUES AND SELF DEVELOPMENT

Course Objectives:

L	T	P/D	C
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1. To offer the students an appropriate set of values to live by
2. To help them achieve a balanced life with appropriate attitudes and behaviour
3. To ensure harmonious life with sustained happiness and prosperity
4. To create awareness on Ethical human conduct, Engineering Ethics, Social responsibility as an engineer.

Course Outcomes:

1. Cultivate the habit of Introspection; Inspirations from within and outside and journal writing to become Successful Engineers with hopes of a better human being.
2. Ethical Responsibilities of Engineers while - dealing with the issues.
3. To maintain work life – balance and societal well being.
4. Develop Right thinking and understanding

UNIT – I

Course Introduction to Values: Need, Guidelines, Content and Educational Process, Application of values, Universal values. Natural Acceptance. Self Exploration – Meditation- self exploration. Continuous Happiness and Prosperity - Right thinking and understanding. Ambition and Aspiration.

UNIT - II:

Harmony in the Human Being:

Harmony in Myself: Human being as a co-existence of 'I' and the material 'Body'. Needs of Self ('I') and 'Body'. The Body as an instrument of 'I' (I being the Doer, Seer and Enjoyer). Harmony of I with the Body, Correct Appraisal of Physical needs

UNIT - III:

Harmony in the Family, Society and in Nature:

Harmony in Human - Human Relationships: Harmony in the Family, Values in Human - Human Relationships, Trust, Respect and other Salient Values in Relationships. Harmony in the Society, Universal Harmony Order.

Harmony in the nature and Existence: Whole existence as Co-existence: Inter-connectedness and Mutual fulfillment among the four orders of nature - Recyclability and Self-regulation in nature.

UNIT - IV:

Professional Ethics:

Introduction, Profession, Professionals, Professionalism, Professional's- roles and risks, Professional Accountability, Ethics in Engineering Profession, Roles of Engineers, Balanced outlook on Law and Responsibilities as Citizens, Professional Responsibilities, Professional Rights.

UNIT - V:

Self Development:

Behavior and Attitude, Stress Management- Types of Stress, Self Management, Choices we make, Excellence.

Meditation: Importance of Meditation, Observation, Introspection, Contemplation, Concentration, Relaxation, Systematic Practice of Meditation.

Inner Cleaning, Need to purify our Conscience and develop Purity in Thoughts and Actions

Journal Writing: Uses and Self Development.

TEXT BOOKS:

1. R. R. Gaur, R Sangal, g p Bagaria, 2009, A foundation course in human values and professional ethics.
2. Professional ethics by R Subramanian Oxford press
3. M Govindrajan, S Natrajan & V. S Senthil kumar, Engineering Ethics (including Humna Values), Eastern Economy Edition, Prentice Hall of India Ltd
4. Self development modules from heartfulness institute (content.heartfulness.org)
5. Prof. K Subba Raju 2013, Success secrets for engineering students, Smart student publication 3rd edition.

REFERENCE BOOKS:

1. Ivan Illich, 1974, Energy & Equity, The Trinity Press, Worcester, and HarperCollins, USA
2. E. F. Schumacher, 1973, small is Beautiful: a study of economics as if people mattered. Blond & Briggs, Britain.
3. A Nagraj, 1998 Jeevan Vidya ek Parichay, Divya Path Sansthan, Amarkantak.
4. Sussan George, 1976, How the Other Half Dies, Penguin Press, Reprinted 1986, 1991.
5. P. L. Dhar, R. R. Gaur, 1990, Science and Humanism, Commonwealth Publishers.
6. A. N. Tripathy, 2003, Human Values, New Age International Publishers.
7. Subhas Palekar, 2000, How to practice Natural Farming, Pracheen(Vaidik) Krishi Tantra Shodh, Amravati.
8. Donella H. Meadows, Dennis L. Meadows, Jorgen Randers, William W. Behrens III, 1972, Limits to Growth - Club of Rome's report, Universe Books.
9. E G Seebauer & Robert L.Berry, 2000, Fundamentals of Ethics for Scientists & Engineers, Oxford University Press.

PROFESSIONAL COMMUNICATION

L T P C
2 0 0 0

Introduction:

The world is in need of effective and efficient professionals. Technical students are to be equipped with Professional Communication skills to enable them to face the growing employment demands. The course has been introduced to bridge the gap between communication skills of ELCS and ACS.

Course Objectives:

To enable a student:

- speak & write intelligible English
- understand professional etiquette and learn appropriate mannerism
- learn about leadership, team building skills and to solve problems by taking decisions
- to present effectively
- knowing his/her strengths and overcoming weaknesses

Course Outcomes:

A student learns:

- to speak and write appropriate English
- the professional demands
- to solve problems and take decisions
- requisite professional skills

Unit: I

Academic Vocabulary and Grammar

Exercises on: Correction of sentences
Tenses, Articles, Prepositions, etc.
Synonyms, Antonyms, One word substitutes, Idioms & Phrases

Unit: II

Self Appraisal

Self Introduction,
SWOT Analysis,
Goal setting
Personality Development

Unit: III

Professional Etiquette

Etiquette
Mannerism
Positive Attitude
Behavioral Traits

Unit: IV

Team Building

Leadership skills
Team Work
Decision Making/ Problem Solving / Conflict managements
Case Study

Unit: V

Presentation Skills

Poster Presentation
Oral Presentation

References:

- 1) Rao, M.S. *Soft Skills Enhancing Employability*. New Delhi: I.K.Publishing House, 2010.
- 2) Rao, Nageshwar. *Communication Skills*. New Delhi: Himalaya Publishing House Pvt.Ltd, 2008
- 3) Ashrif Rizvi. *Effective Technical Communication*, Tata Mc Grahill, 2011.
- 4) Daniel G. Riordan & Steven E. Pauley. *Technical Report Writing Today*, Biztantra Publishers, 2005.
- 5) David A McCurry & Joanne Buckely, *Handbook for Technical Writing* CENGAGE Learning 2008.
- 6) *Raymond Murphy's English Grammar with CD*, Murphy, Cambridge University Press, 2012.
- 7) William Standard. *Living English Structures-* Allen-Pearson, 2011.
- 8) S M Guptha. *Current English Grammar and Usage*, PHI, 2013.
- 9) Krishna Swami. *Modern English Grammar-*, McMillan, 2009.
- 10) Anjana Agarwal. *Powerful Vocabulary Builder*, New Age International Publishers, 2011

DISASTER MANAGEMENT

L	T	P/D	C
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Course Objectives:

1. To provide knowledge related to the broad field of environmental risk assessment.
2. Steps involved in the risk assessment process, including statistical characterization of observed data.
3. Knowledge about tools that can be used in defining environmental risks, particularly as related to human health.
4. To develop practical skills in disaster mitigation, planning, response and post disaster rehabilitation, particularly related to health and public health.

Course Outcomes:

1. Develop an understanding of the key concepts, definitions a key perspectives of all Hazards Emergency Management
2. Understand the Emergency/Disaster Management Cycle
3. Have a basic understanding for the history of Emergency Management
4. Develop a basic under understanding of Prevention, Mitigation, Preparedness, Response and Recovery
5. Develop a basic understanding for the role of public and private partnerships

UNIT-I

Introduction to the Different Types of Disasters:

Natural Disasters- Meaning and nature of natural disasters, their types and effects. Floods, drought, cyclone, earthquakes, landslides, avalanches, volcanic eruptions, Heat and cold waves, Climatic change: global warming, Sea level rise, ozone depletion.

Man Made Disasters- Nuclear disasters, chemical disasters, biological disasters, building fire, coal fire, forest fire, oil fire, air pollution, water pollution, deforestation, industrial waste water pollution, road accidents, rail accidents, air accidents, sea accidents.

UNIT-II

Environment and Disasters:

Environment, ecosystem and disasters. Climate change – issues and concerns. Industrial hazards and safety measures. Post disaster impact on environment. Impact of developmental projects on disaster risk. Aspects of environmental management for disaster risk reduction. Environmental Impact Assessment (EIA).

UNIT-III

Disaster Risk Mitigation:

Disaster risk assessment (Hazard-Vulnerability-Capacity analysis), Hazard mapping and forecasting. Principles and aspects of Disaster prevention Disaster mitigation Preparedness for damage mitigation and coping with disasters. Capacity building for disaster/damage mitigation (structural and non-structural measures). Contingency planning for damage mitigation of different hazards.

UNIT-IV

Disaster Management:

Effect to migrate natural disaster at national and global levels. International strategy for disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, community –based organizations and media. Central, state, district and local administration; Armed forces in disaster response; Disaster responses; Police and other organizations. (2009).

UNIT-V

Planning for Disaster Rescue and Risk Reduction:

Community-hazard profile of the disaster site. DM cycle, Different phases of Disaster Management: Predisaster stage, Emergency stage, Post disaster stage. Implementation of different disaster management phase and Relief mechanism during different disaster stages including cyclones, earthquakes, fire accidents, Tsunami, landslides etc. Disaster Management Act (2005); Disaster Management Policy (2009).

TEXT BOOKS:

1. Disaster Mitigation: Experiences and Reflections by Pradeep Sahni, (2013).
2. Natural Hazards & Disasters by Donald Hyndman & David Hyndman - Cengage Learning (2009).