ACADEMIC REGULATIONS COURSE STRUCTURE

&

DETAILED SYLLABI

B.Tech Regular Four Year Degree Courses

(For the Batches Admitted From 2017-2018)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2018-2019)

ELECTRONICS AND COMMUNICATION ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (Autonomous)

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(**Affiliated to J.N.T. University Anantapur, Ananthapuramu).**

ACADEMIC REGULATIONS

B.Tech. Regular Four Year Degree Program

(For the batches admitted from the academic year 2017-18)

and

B.Tech. (Lateral Entry Scheme)

(For the batches admitted from the academic year 2018-19)

1. Applicability : All the rules specified herein, approved by the Academic Council, will be in force and applicable to students admitted from the academic year 2017-2018 onwards. Any reference to "College" in these rules and regulations stands for Sri Venkateswara College of Engineering and Technology (Autonomous).

2. Extent : All the rules and regulations, specified herein after shall be read as a whole for the purpose of interpretation and as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, Principal, Sri Venkateswara College of Engineering and Technology (A) shall be the Chairman of the Academic Council.

3. Admission :

3.1 Admission in to first year of Four Year B.Tech., Degree Program of study in Engineering :

3.1.1 Eligibility : A candidate seeking admission into the first year of four year B.Tech., Degree Program should have

Passed either Intermediate Public Examination conducted by the Board of Intermediate Education, Government of Andhra Pradesh with Mathematics, Physics and Chemistry as optional subjects (or any equivalent examination recognized by the Board of Intermediate Education and JNTU Anantapur) or Diploma in Engineering

in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or equivalent Diploma recognized by State Board of Technical Education, Government of Andhra Pradesh and JNTU Anantapur) for admission.

3.1.2 Admission Procedure : As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech., Degree Program as follows:

Seats under various categories are filled as per the norms prescribed by the Government of Andhra Pradesh.

3.2 Admission into the second year of four Year B.Tech., Degree Program in Engineering:

3.2.1 Eligibility : Candidates qualified in ECET (FDH) and / or admitted by the Convener, ECET (FDH).

In all such cases for admission, when needed, Permissions from the statutory bodies are to be obtained.

3.2.2 Admission Procedure : Lateral Entry seats are filled as per the norms prescribed by the Government of Andhra Pradesh from time to time.

4. Programs of study offered leading to the award of B.Tech degree

1. B.Tech (Civil Engineering)
2. B.Tech (Electrical and Electronics Engineering)
3. B.Tech (Mechanical Engineering)
4. B.Tech (Electronics and Communication Engineering)
5. B.Tech (Computer Science and Engineering)
6. B.Tech (Information Technology)
7. B.Tech (Automobile Engineering)
8. B.Tech (Electronics and Telecommunication Engineering)
9. B.Tech (Electronics Engineering)
10. B.Tech (Computer Science and Systems Engineering)

5. Choice Based Credit System

The Indian Higher Education Institutions (HEI's) are changing from the conventional course structure to Choice Based Credit System (CBCS) along with introduction to semester system at first year itself. The semester system helps in accelerating the teaching-learning process and enables vertical and horizontal mobility in learning.

The credit based semester system provides flexibility in designing curriculum and assigning credits based on the course content and hours of teaching. The choice based credit system provides a 'cafeteria' type approach in which the students can take courses of their choice, learn at their own pace, undergo additional courses and adopt an interdisciplinary approach to learning.

Choice Based Credit System (CBCS) is a flexible system of learning and provides choice for students to select from the prescribed elective courses. A course defines learning objectives and learning outcomes and comprises of lectures / tutorials / laboratory work / field work / project work / comprehensive Examination / seminars / presentations / self-study etc. or a combination of some of these.

Under the CBCS, the requirement for awarding a degree is prescribed in terms of number of credits to be completed by the students.

The CBCS permits students to:

1. Choose electives from a wide range of elective courses offered by the departments.
2. Undergo additional courses of interest.
3. Adopt an interdisciplinary approach in learning.
4. Make the best use of expertise of the available faculty.

6. Medium of instruction

The medium of instruction shall be English for all courses, examinations, seminar presentations and project work. The curriculum will comprise courses of study as given in course structure, in accordance with the prescribed syllabi.

7. Types of Courses

Courses in a programme may be of six kinds: **Foundation, Skill, Core, Elective, Audit and Mandatory.**

7.1 Foundation / Skill Course:

Foundation courses are the courses based upon the content leads to enhancement of skill and knowledge as well as value based and are aimed at man making education. Skill subjects are those areas in which one needs to develop a set of skills to learn anything at all. They are fundamental to learning any subject.

7.2 Core Course:

There may be a core course in every semester. This is the course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

7.3 Elective Course:

Electives provide breadth of experience in respective branch and applications areas. Elective course is a course which can be chosen from a pool of courses. It may be:

- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline / domain
- Nurturing student's proficiency / skill.

An elective may be discipline centric (Professional Elective) focusing on those courses which add generic proficiency to the students or may be chosen from an interdisciplinary area called as "Open Elective".

There are four professional elective groups. Students can choose not more than one elective from each of the four groups. Also there are two open elective groups, students can choose not more than one elective from each of the two groups.

8. Academic Year

8.1 Course Duration

8.1.1 Course duration for B. Tech program of study is 4 years and the maximum duration to complete the program is 8 years excluding the gap year.

8.1.2 For lateral entry students the course duration is 3 years and the maximum duration to complete the program is 6 years excluding the gap year.

8.2 Each academic year is divided into two semesters and each semester shall have a minimum of 90 working days.

8.3 Students admitted on transfer from JNTU affiliated institutes, Universities and other institutes in the subjects in which they are required to earn credits so as to be on par with regular students as prescribed by concerned 'Board of Studies'.

9. Unique course identification code

Every course of the B. Tech program will be placed in one of the eleven groups of courses as listed in the table 1. The various courses and their two-letter codes are given below.

Table 1: Group of Courses

S.No.	Branch	Code
1	Civil Engineering	CE
2	Electrical and Electronics Engineering	EE
3	Mechanical Engineering	ME
4	Electronics and Communication Engineering	EC
5	Computer Science and Engineering	CS
6	Information Technology	IT
7	Automobile Engineering	AT

8	Electronics and Telecommunication Engineering	ET
9	Electronics Engineering	EL
10	Computer Science and Systems Engineering	CT
11	Humanities and Basic Sciences	HS
12	MBA	MB
13	MCA	MC

10. Curriculum and course structure

The curriculum shall comprise Foundation / Skill Courses, Core Courses, Elective Courses, Laboratory Courses, Audit Courses, Mandatory Courses, Comprehensive Examination, Mini Project, Internship and Project work. The list of elective courses may include subjects from allied disciplines also.

Contact Periods: Depending on the complexity and volume of the course, the number of contact hours per week will be assigned. Each Theory and Laboratory course carries credits based on the number of hours / week as follows.

- **Contact classes (Theory):** 1 credit per lecture hour per week.
- **Laboratory Hours (Practical):** 1 credit for 2 Practical hours, per week.
- **Project Work:** 1 credit for 2 hours of project work per week.
- **Mini Project:** 1 credit for 2 hours per week.

10.1 Course Structure

Every program of study shall be designed to have 38-42 theory courses and 20-26 laboratory courses. Every course of the B.Tech program will be placed in one of the eight categories with average credits as listed in the Table 2. In this, a student has to carry out a mini project, project work and comprehensive Examination also.

Table 2: Category-wise Distribution of Credits

S.No.	Category	Subject Area and % of Credits	Average No. of Credits
1	Humanities and Social Sciences (HS), including Management.	HS (05% to 10%)	9
2	Basic Sciences (BS) including Mathematics, Physics and Chemistry.	BS (15% to 20%)	23
3	Engineering Sciences (ES), including Workshop, Drawing, Basics of Electrical / Electronics / Mechanical / Computer Engineering.	ES (15% to 20%)	34
4	Professional Subjects-Core (PC), relevant to the chosen specialization / branch.	PC (30% to 40%)	70

5	Professional Subjects-Electives (PE), relevant to the chosen specialization / branch.	PE (10% to 15%)	12
6	Open Subjects-Electives (OE), from other technical and / or emerging subject area.	OE (05% to 10%)	6
7	Project Work or Full Semester Internship, Mini Project, Comprehensive Examination.	10% to 15%	22
8	Mandatory Courses / Audit Courses.	MC / AC	-
TOTAL			176

11. Evaluation Methodology

11.1 Theory course:

Each theory course will be evaluated for a total of 100 Marks, with 40 Marks for Continuous Internal Assessment (CIA) and 60 Marks for Semester End Examination (SEE).

11.2 Continuous Internal Assessment (CIA)

The distribution of marks for Continuous Internal Assessment is as follows:

Two Sessional Examinations : 25 Marks
Two Quiz Examinations : 10 Marks
2 Assignments : 05 Marks
40 Marks

11.3 Question Paper Pattern for Sessional Examinations

11.3.1 Each sessional exam question paper consists of two parts, namely Part A and Part B. Part A is compulsory which carries 10 marks and consists of five short answer type questions with each carrying 2 marks. In Part B, 4 questions with each carrying 5 marks may be given and the student is expected to answer any three of the four questions. The questions may be set as per Bloom's Taxonomy. Time duration for each sessional exam is 2 hours. Internal marks for sessional examinations shall be arrived at by considering the marks secured by the student in both the sessional examinations with 80% weightage to the better sessional exam and 20% to the other.

However if any of the students is absent for both the sessional exams, he may be permitted to appear for one make up examination after second sessional examination with valid medical / emergency grounds. Internal marks for sessional examinations shall be arrived as per the Weightage given above.

11.3.2 Two Quiz examinations, along with sessional examinations for 20 minute duration and for 10 marks shall be conducted. Each Quiz exam consists of 20 multiple choice questions and are to be answered by choosing the correct answer from a given set of 4

choices. Marks for the Quiz exams shall be awarded by considering the average of the two Quiz exams conducted.

11.3.3 Two Assignments, each one for 5 marks shall be given to the students one before the first sessional exam and the other before the second sessional exam. Internal marks for the assignments shall be awarded by considering the average of the two assignments.

11.4 Semester End Examination (SEE)

The SEE is conducted for 60 marks of 3 hours duration. The syllabus for the theory course is divided into FIVE units. SEE Question Paper consists of two parts, Part A and Part B. Part A consists of 5 short answer type questions, each carries 2 marks for a total of 10 marks with no choice.

Part B Consists of 5 questions with one question from each of the 5 units with internal choice with 10 marks for each question.

The emphasis on the questions is broadly based on objective skill, analytical skill and application skill following the outcome based education.

11.5 Laboratory Course

Each Laboratory Course will be evaluated for a total of 100 marks, consisting of 40 marks for internal assessment (CIA) and 60 marks for semester end lab examination. Out of 40marks of CIA, continuous lab assessment (SEE) for day to day performance will be done for 20 marks, final internal lab examination carries 15 marks and Viva-Voce carries 5 marks. The semester end lab examination for 60 marks shall be conducted by two examiners, one of them being internal examiner (subject teacher) and the other being external examiner (other than the teacher handled) to be nominated by the Principal from the panel of experts as recommended by the Chairman, BOS. The scheme of valuation for the 60 Marks will be informed to the students in advance by the concerned Chairman, BOS and displayed in the laboratory during the beginning of the semester.

11.6. Drawing Courses:

All the **drawing** related courses are evaluated in line with laboratory courses. The distribution shall be 40 marks for internal evaluation (20 marks for day to day work and 20 marks for final internal test) and 60 marks for semester end examinations.

- **Question paper pattern for drawing courses will be followed as mentioned in the syllabus.**

  The following courses are considered as theory subjects, but for all practical purposes examination will be conducted like practical.

  i. Computer Aided Engineering Drawing
  ii. Production Drawing Practice & Machine Drawing

11.7 Mandatory courses (Other than MOOCs)

Mandatory courses will not carry any credits; but, a pass in each such course after attaining required CIE and SEE requirements during the programme shall be necessary requirement for student to qualify for the award of Degree. Its result shall be declared with "satisfactory" (Pass) or Not Satisfactory (Fail) performance.

11.8 Massive Open Online Courses (MOOCs):

The college in line with the developments in Learning Management Systems (LMS) intends to encourage the students to do online courses in MOOCs, offered internationally. The main intention to introduce MOOCs is to obtain enough exposure through online tutorials, self-learning at one's own pace, attempt quizzes, discuss with professors from various universities and finally to obtain certificate of completion of the course from the MOOCs providers.

Regulations for MOOCs:

11.8.1 MOOC courses are offered as Mandatory courses. Each student has to do 3 MOOC Courses.

11.8.2 Institution intends to encourage the students to do one MOOC in each semester, from III year I Semester to IV year I Semester of the B.Tech. Programme

11.8.3 The respective departments shall give a list of standard MOOCs providers among edx, Udacity, Coursera, NPTEL or any other standard providers, whose credentials are endorsed by the HOD.

11.8.4 The HOD shall appoint Coordinators / Mentors and allot the students to them who shall be responsible to guide students in selecting online courses and provide guidance for the registration, progress and completion of the same.

11.8.5 A student shall choose an online course (relevant to his / her programme of study in the concerned semester) from the given list of MOOCs providers, as endorsed by the teacher concerned, with the approval of the HOD.

11.8.6 HOD & Coordinator must review the progress of the conduct of these courses once in a fortnight and advise the students accordingly.

11.8.7 In case a student fails to complete the MOOCs he / she shall re-register for the same with any of the providers from the list provided by the department.

11.8.8 In case any provider discontinues to offer the course, Institution shall allow the student to opt for any other provider from the list provided by the department, for completion of the MOOC course.

11.8.9 The details of MOOC(s) shall be displayed in Grade card of a student, provided he / she submits the proof of completion of it or them to the department concerned through the Coordinator / Mentor, before the end of the concerned semester.HOD has to forward the same to the Exam cell with his attestation.

11.8.10 The Provisional Degree Certificate and / or consolidated grade sheet shall be issued only to those students, who have submitted proof of completion of MOOC(S), for the courses they have registered with to the Examination cell through the HOD concerned.

11.8.11 The result of all the three MOOC courses will be reflected in the corresponding semester Grade Sheet.

11.9 EPIC Courses: EPIC (Engineering Projects in Community Development) courses are introduced and offered as Mandatory courses, one in the II B. Tech I semester and another in the II B. Tech II semester.

Guidelines for awarding CIE & SEE marks for the EPIC courses:

CIE: For awarding CIE marks (maximum 40) there shall be two assessment with each Assessment carries 20 marks.

I Assessment: Report writing & Presentation-I which carries 20 marks conducted after completion of I & II units.

II Assessment: Report writing & Presentation-II which carries 20 marks conducted after completion of the last three units.

Marks obtained in the two assessments will be added to award CIE marks for 40.

However if any of the students is absent for both the assessments, he/she may be permitted to appear for one make up assessment conducted after second assessment on valid medical / emergency grounds.

SEE: For awarding SEE marks (maximum 60) student need to submit a detailed project and give a presentation on the date specified by the department. The work done, execution and presentation by the student will be evaluated for 60 marks by two examiners, one of them being internal examiner (subject teacher) and the other being external examiner (other than the teacher concerned) to be nominated by the Principal from the panel of experts as recommended by the chairman BOS.

One who fails to secure minimum pass marks in CIE & SEE put together has to reappear for SEE examination as and when it is conducted and to get pass marks in CIE & SEE put together so as to qualify for the award of B.Tech degree.

Attendance is mandatory for these courses.

11.10 Audit Courses

Students to be able to register for courses outside the prescribed range of Credits for audit only, when interested to supplement their knowledge / skills; any student who wishes to pursue audit course can register for the same with the concerned teacher and attend to the classes regularly. No examination will be conducted, no grade will be given for the audit courses. However such of those students who have registered and got the requisite attendance of 75% in the audit course, it will be mentioned in their grade sheet.

11.11 Comprehensive Online Examination

There shall be two comprehensive online examinations, one at the end of the III year I sem and the other at the end of III year – II sem, with 50 objective questions for 100 marks on the subjects studied in the respective semesters. A student shall acquire half credit assigned to the comprehensive online examination only when he secures 40% or more marks. In case, if a student fails in comprehensive online examination, he shall reappear/re-register by following a similar procedure adopted for the lab examinations.

11.12 Comprehensive Viva-Voce

There shall be a Comprehensive Viva-Voce in IV year – II sem for 2 credits. The Comprehensive Viva-Voce will be conducted by the committee consisting of Head of the Department and two senior faculty members of the department nominated by the Principal as recommended by the chairman, BOS. The Comprehensive Viva – Voce is aimed to assess the students understanding in various subjects he studies during the B. Tech course of study. The Comprehensive Viva – Voce shall be evaluated for 100 marks by the committee. There are no internal marks for the Comprehensive Viva – Voce. A student shall acquire 2 credits assigned to the Comprehensive Viva – Voce only when he secures 40% or more marks. In case, if a student fails in Comprehensive Viva – voce, he shall reappear as and when IV/II supplementary examinations are conducted.

11.13 Mini Project

The Mini Project shall be carried out during IV year I semester with one credit along with other lab courses by having regular weekly slots. Students will take mini project batch wise and the batches will be divided as per the guidelines issued. The topic of mini project should be so selective that the students are enabled to complete the work in the stipulated time with the available resources in the respective laboratories. The scope of the mini project could be handling part of the consultancy work, maintenance of the existing equipment, development of new experiment setup or can be a prelude to the main project with a specific outcome. Mini project report will be evaluated for 100 marks in total, assessment will be done by the supervisor / guide for 40 marks based on the work and presentation / execution of the mini project. Subdivision for the remaining 60 marks is based on report, presentation, execution and viva-voce. Evaluation shall be done by a committee comprising the mini project supervisor, Head of the department and one senior faculty nominated by the Principal from the panel of experts recommended by chairman, BOS.

11.14 Project Work

There shall be a Project Work in the IV year second semester which carries 12 credits. Out of 100 marks allotted for the project work, 40 marks shall be for Internal Evaluation and 60 marks for the End Semester Examination (Viva – Voce). The Viva – Voce shall be conducted by a committee consisting of HOD, Project Supervisor and an External Examiner nominated by the

Principal from the panel of examiners recommended by Chairman, BOS. The Evaluation of project work shall be conducted at the end of the IV year – II semester. The Internal Evaluation shall be made by the departmental committee, on the basis of two seminars given by each student on the topic of his project.

11.15 Internship

Students shall have an option to do internship for a minimum period of 6 weeks in an Industry during summer break after III year II semester examinations. In such cases the industry shall evaluate the students performance in terms of his attendance and marks scored out of 100 in the prescribed format supplied by the department, and return the same directly to the department after the end of the internship. A student who attains required attendance and minimum 40% marks shall be awarded 3 Credits and he shall be exempted from taking one Professional elective offered in the IV year II semester by the department for 3 credits.

11.16 Gap Year

Gap Year – concept of Student Entrepreneur in Residence shall be introduced and outstanding students who wish to pursue entrepreneurship are allowed to take a break of one year at any time after II year to pursue entrepreneurship full time. This period may be extended to two years at the most and these two years would not be counted for the time for the maximum time for graduation. The HOD of the respective department shall forward such proposals submitted by the students to the Principal. An evaluation committee shall be constituted by the Principal to evaluate the proposal submitted by the student and the committee shall decide whether or not to permit student (s) to avail the Gap Year.

12. Attendance Requirements and Detention Policy

12.1 A student shall be eligible to appear for Semester – End examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in a semester.

12.2 Condonaion of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in each semester may be granted on medical grounds by the College Academic Committee. A stipulated fee shall be payable towards condonation of shortage of attendance to the College.

12.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned and the candidate will be detained.

12.4 Detained students are not eligible to take their end examination of that class and their registration shall stand cancelled.

12.5 A student detained due to shortage of attendance, will have to repeat that semester when offered next.

13. Conduct of Semester End Examination and Evaluation

13.1 Semester end examination shall be conducted by the Controller of Examination (COE) by inviting 70% Question Papers from the External and 30% Question papers from the Internal Subject Experts. Principal will decide the External and Internal subject experts.

13.2 The answer papers of semester end examination should be evaluated externally / internally.

13.3 The marks for the internal evaluation components will be added to the external evaluation marks secured in the Semester – End examinations, to arrive at total marks for any subject in that semester.

13.4 Performance in all the subjects is tabulated program-wise and will be scrutinized by the office of the Controller of Examinations. Total marks obtained in each subject are converted into letter grades. Finally subject-wise marks and grades details, subject-wise and branch-wise pass percentages are calculated through software.

13.5 **Results Committee:**

Results Committee comprising of Director, Principal, Controller of Examinations, one Senior Professor nominated by the Principal and the University Nominee will oversee the details of marks, grades and pass percentages of all the subjects and branch-wise pass percentages.

13.6 Office of the Controller of Examinations will generate student-wise result sheets and the same will be published through college website.

13.7 Student-wise Grade Sheets are generated and issued to the students.

14. Academic Requirements for Promotion / Completion of regular B.Tech programme of study

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

14.1 For students admitted in B.Tech (Regular) Program:

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

ii. A student shall be promoted from second year to third year only if he fulfills the academic requirement of securing 44 credits from:

a) Two regular and two supplementary examinations of I-year I semester.

b) Two regular and one supplementary examinations of I-year II semester.

c) One regular and one supplementary examination of second year I semester.

d) One regular examination of II- year II Semester.

Irrespective of whether the candidate appear for Semester-End examination or not as per the normal course of study.

iii. A student shall be promoted from third year to fourth year Program of study only if he fulfills the academic requirements of securing 66 credits from:

a) Three regular and three supplementary examinations of I-year I semester.
b) Three regular and two supplementary examinations of I-year II Semester
c) Two regular and two supplementary examination of second year I semester.
d) Two regular and one supplementary examinations second year II semester.
e) One regular and one supplementary examination of third year I semester.
f) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appears for the Semester-End examination or not as per the normal course of study and in case of getting detained for want of credits by sections 14.1(ii) and 14.1 (iii) above, the student may make up the credits through supplementary examinations before the date of commencement of class work for III year I semester or IV year I semester as the case may be.

iv. A student shall register for all the 176 credits and earn all the 176 credits. Marks obtained in all the 176 credits shall be considered for the award of the class based on CGPA.

v. A student who fails to earn 176 credits as indicated in the course structure within eight academic years from the year of his admission shall forfeit his seat in B. Tech., Program and his admission stands cancelled.

14.2 For Lateral Entry Students

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

ii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of securing 44 credits from the following examinations.

a) Two regular and two supplementary examinations of II year I semester.
b) Two regular and one supplementary examination of II year II semester.
c) One regular and one supplementary examination of III year I semester.
d) One Regular Examination of Third year II semester.

Irrespective of whether the candidate appear the Semester-End examination or not as per the normal Course of study and in case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I semester.

iii. A student shall register for all 132 credits and earn all the 132 credits. Marks obtained in all 132 credits shall be considered for the award of the class based on CGPA.

iv. A student who fails to earn 132 credits as indicated in the Course structure within six academic years from the year of his admission shall forfeit his seat in B.Tech., Program and his admission stands cancelled.

15. Letter Grades and Grade points

15.1 Performances of students in each course are expressed in Letter Grades based on absolute grading system. The UGC recommends a 10-point grading system with the following letter grades as given in the Table 3.

Table 3: Grade Points Scale (Absolute Grading)

Range of Marks	Grade Point	Letter Grade
90-100	10	S (Outstanding)
80-89	9	A+ (Excellent)
70-79	8	A (Very Good)
60-69	7	B+ (Good)
50-59	6	B (Above Average)
45-49	5	C (Average)
40-44	4	D (Pass)
Below 40	0	F (Fail)
Absent	0	N (Absent)

15.2 A student obtaining Grade F shall be considered Failed and will be required to re-appear in the examination.

15.3 For non credit courses, 'P' for 'Satisfactory' or 'F' for 'Not Satisfactory' is indicated and this will not be counted for the computation of SGPA / CGPA.

15.4 At the end of each semester, the institute issues grade sheet indicating the SGPA and CGPA of the student. However, grade sheet will not be issued to the student if he has any outstanding dues.

16. Computation of SGPA and CGPA

The UGC recommends to compute the Semester Grade Point Average (SGPA) and Cumulative Grade Point Average (CGPA). The credit points earned by a student are used for calculating the Semester Grade Point Average (SGPA) and the Cumulative Grade Point Average (CGPA), both of which are important performances indices of the student. SGPA is equal to the sum of all the total points earned by the student in a given semester divided by the number of credits registered by the student in that semester. CGPA gives the sum of all the total points earned in all the previous semesters and the current semester divided by the number of credits registered in all these semesters. Thus,

$$SGPA = \sum_{i=1}^{n} (C_i G_i) \; / \; \sum_{i=1}^{n} C_i$$

Where, C_i is the number of credits of the i^{th} course and G_i in the grade point scored by the student in the i^{th} course and n represent the number of courses in which a student is registered in the concerned semester.

$$CGPA = \sum_{j=1}^{m}(C_j S_j) \; / \; \sum_{j=1}^{m} C_j$$

Where, S_j is the SGPA of the j^{th} semester and C_j is the total number of credits upto the semester and m represent the number of semesters completed in which a student registered upto the semester.

The SGPA and CGPA shall be rounded off to 2 decimal points and reported in the transcripts.

16.1 In case of a specific query by students / employers regarding Semester Grade Point Average (SGPA) / Cumulative Grade Point Average (CGPA) into percentage, the following formulae will be adopted for notional conversion of SGPA / CGPA into percentage.

SGPA to Percentage = (SGPA-0.5) × 10

CGPA to Percentage = (CGPA-0.5) × 10

17. Grade Sheet

A grade sheet will be issued to each student indicating his performance in all subjects registered in that semester indicating the SGPA and CGPA. SGPA and CGPA will be rounded off to the second place of decimal.

18. Consolidated Grade Sheet

After successful completion of the entire Program of study, a Consolidated Grade Sheet containing performance of all academic years will be issued as a final record. Transcripts will also be issued, if required, after payment of requisite fee.

19. Award of Degree

The Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Ananthapuramu on the recommendation of the Principal of SVCET (Autonomous), Chittoor

19.1 Eligibility:

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

- Registered and successfully completed all the components prescribed in the program of study for which he is admitted.
- Successfully acquired the minimum required credits as specified in the curriculum corresponding to the branch of study within the stipulated time.

- Obtained CGPA greater than or equal to 4.0 (Minimum requirement for declaring as passed.)

19.2. Award of Class

Declaration of Class is based on CGPA.

Cumulative Grade Point Average	Class
≥7.5	First Class with Distinction
≥6.5 and<7.5	First Class
≥5.5 and <6.5	Second Class
≥4.0 and<5.5	Pass Class

20. Personal verification / Revaluation / Final Valuation

20.1 Personal verification of answer scripts:

Candidates appear in a particular semester end examinations may appeal for verification of their answer script(s) for arithmetic correction in totaling of marks and any omission / deletion in evaluation within 7 days from the date of declaration of results at the office of the Controller of Examinations on the prescribed proforma and by paying the prescribed fee per answer script.

It is clarified that personal verification of answer script shall not tantamount to revaluation of answer script. This is only a process of reverification by the candidate. Any mistake / deficiency with regard to arithmetic correction in totaling of marks and any omission / deletion in evaluation if found, the institution will correct the same.

20.2 Recounting / Revaluation:

Students shall be permitted for request for recounting/revaluation of the Semester-End examination answer scripts within a stipulated period after payment of prescribed fee. After recounting or revaluation, records are updated with changes if any and the student will be issued a revised grade sheet. If there are no changes, the same will be intimated to the students.

20.3 Final Valuation:

Students shall be permitted for request for final valuation of the Semester – End Examination answer scripts within a stipulated period after the publication of the revaluation results by paying the necessary fee. The final valuation shall be carried out by an expert not less than Associate Professor as per the scheme of valuation supplied by the examination branch in the presence of the student, Controller of Examinations and Principal. However students are not permitted to discuss / argue with the examiner. If the increase in marks after final valuation is equal to or more than 15% of the previous valuation marks, the marks obtained after final valuation shall be treated as final. If the variation of marks after final

valuation is less than 15% of the previous valuation marks, then the earlier valuation marks shall be treated as the final marks.

21. Termination from the program

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

a. The student fails to satisfy the requirements of the program within the maximum period stipulated for the program.
b. The student fails to satisfy the norms of discipline specified by the institute from time to time.

22. With-Holding of results

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

23. Graduation Day

The institute shall have its own annual Graduation Day for the award of Provisional Certificates to students completing the prescribed academic requirements in each case, in consultation with the University and by following the provisions in the Statute. The college shall institute prizes and medals to meritorious students and award them annually at the Graduation Day. This will greatly encourage the students to strive for excellence in their academic work.

24. Discipline

Every student is required to observe discipline and decorum both inside and outside the institute and not to indulge in any activity which will tend to bring down the honor of the institute. If a student indulges in malpractice in any of the theory / practical examination, continuous assessment examinations he shall be liable for punitive action as prescribed by the Institute from time to time.

25. Grievance Redressal Committee

The institute shall form a Grievance Redressal Committee for each course in each department with the Course Teacher and the HOD as the members. This Committee shall solve all grievances related to the course under consideration.

26. Transitory Regulations

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

semester from the date of commencement of class work with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch they join later.

A regular student has to satisfy all the eligibility requirements within the maximum stipulated period of eight years, and a lateral entry student within six years, for the award of B.Tech Degree.

i. The students joining under R-17 Regulations from previous Regulations in II B.Tech II semester need not complete the mandatory course EPIC I offered in the II B.Tech I semester for the award of B.Tech degree.
ii. The students joining under R-17 Regulations from previous Regulations in III B.Tech I semester/III B.Tech II semester/ IV B.Tech I semester/ IV B.Tech II semester need not complete the mandatory EPIC course offered in the II B.Tech I semester and II B.Tech II semester for the award of B.Tech degree.

27. Revision of Regulations and Curriculum

The Institute from time to time may revise, amend or change the regulations, scheme of examinations and syllabi if found necessary and on approval by the Academic Council and the Governing Body shall come into force and shall be binding on the students, faculty, staff, all authorities of the Institute and others concerned.

28. General

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

FAILURE TO READ AND UNDERSTAND THE REGULATIONS IS NOT AN EXCUSE

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Scheme of Instruction and Examination under R17 Regulations

I B.Tech., I SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS01	English for Communication I	BS	Foundation	3	-	-	3	40	60	100
17AHS02	Differential Equations and Vector Calculus	BS	Foundation	3	1	-	3	40	60	100
17AHS03	Engineering Physics	BS	Foundation	3	1	-	3	40	60	100
17ACS01	Computer Programming in C	ES	Foundation	3	-	-	3	40	60	100
17AEE02	Network Theory	ES	Foundation	3	1	-	3	40	60	100
17AME02	Computer Aided Engineering Drawing	ES	Foundation	1	-	4	3	40	60	100
17AHS07	Communication Skills Lab	BS	Foundation	-	-	2	1	40	60	100
17AHS08	Engineering Physics Lab	BS	Foundation	-	-	3	1.5	40	60	100
17ACS02	Computer Programming Lab	ES	Foundation	-	-	3	1.5	40	60	100
Total				**16**	**3**	**12**	**22**	**360**	**540**	**900**

I B.Tech. II SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS09	Numerical and Transform Techniques	BS	Foundation	3	1	-	3	40	60	100
17AHS04	Engineering Chemistry	BS	Foundation	3	-	-	3	40	60	100
17AHS05	Environmental Studies	HS	Foundation	3	-	-	3	40	60	100
17AEC01	Electronic Devices and Circuits	ES	Foundation	3	1	-	3	40	60	100
17AEE06	Electrical Technology	ES	Foundation	3	1	-	3	40	60	100
17ACS03	Data Structures	ES	Foundation	3	-	-	3	40	60	100
17AHS06	Engineering Chemistry Lab	BS	Foundation	-	-	3	1.5	40	60	100
17AME03	Engineering Practices Lab	ES	Foundation	-	-	2	1	40	60	100
17ACS05	Data Structures Lab	ES	Foundation	-	-	3	1.5	40	60	100
	***Audit Course - I	AC	Perspective	-	-	-	-	-	-	-
Total				**18**	**3**	**8**	**22**	**360**	**540**	**900**

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II B.Tech., I SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AHS14	Special Functions and Complex Analysis	BS	Foundation	3	1	-	3	40	60	100
17ACS06	Object Oriented Programming through Java	ES	Foundation	3	-	-	3	40	60	100
17AMB01	Managerial Economics and Financial Analysis	HS	Foundation	3	-	-	3	40	60	100
17AEC02	Electronic Circuit Analysis	PC	Core	3	1	-	3	40	60	100
17AEC03	Signals and Systems	PC	Core	3	1	-	3	40	60	100
17AEC04	Switching Theory and Logic Design	PC	Core	3	1	-	3	40	60	100
17AEE11	Electrical Technology Lab	ES	Foundation	-	-	3	1.5	40	60	100
17AHS17	Technical Writing and Content Development Lab	BS	Foundation	-	-	2	1	40	60	100
17AEC07	Electronic Devices and Circuits Lab	ES	Foundation	-	-	3	1.5	40	60	100
17AHS18	English for Communication - II	MC	Perspective	-	-	-	-	40	60	100
17AME64	EPIC I : Introduction To Engineering Projects			-	2	-	-	40	60	100
Total				**18**	**6**	**8**	**22**	**440**	**660**	**1100**

II B.Tech., II SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AEC08	Analog Communications	PC	Core	3	1	-	3	40	60	100
17AEC09	Probability Theory and Stochastic Processes	PC	Core	3	1	-	3	40	60	100
17AEC10	Pulse and Digital Circuits	PC	Core	3	1	-	3	40	60	100
17AMB02	Management Science	HS	Foundation	3	-	-	3	40	60	100
17AEE14	Control Systems	ES	Foundation	3	1	-	3	40	60	100
17AEC11	Electro Magnetic Fields and Transmission Lines	PC	Core	3	1	-	3	40	60	100
17AEC14	Signals and Systems Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC15	Pulse and Digital Circuits	PC	Core	-	-	2	1	40	60	100

	Lab									
17AEC16	Electronic Circuit Analysis Lab	PC	Core	-	-	3	1.5	40	60	100
17AME65	EPIC II : Engineering Projects in Community Service			-	2	-	-	40	60	100
	*** Audit Course - II	AC	Perspective	-	-	-	-	-	-	-
Total				**18**	**7**	**8**	**22**	**400**	**600**	**1000**

III B.Tech., I SEMESTER

Course Code	**Course Name**	**Subject Area**	**Category**	**Periods per week**			**Credits**	**Scheme of Examination Max. Marks**		
				L	**T**	**P**		**CIA**	**SEE**	**Total**
17AEC19	Digital Communications	PC	Core	3	1	-	3	40	60	100
17AEC20	Linear IC Applications	PC	Core	3	1	-	3	40	60	100
17AEC21	Microprocessors and Microcontrollers	PC	Core	3	-	-	3	40	60	100
17AEC22	Antenna and Wave Propagation	PC	Core	3	1	-	3	40	60	100
17AEC23	Digital IC Applications	PC	Core	3	1	-	3	40	60	100
17AEC _ _	* Professional Elective-I	PE	Elective	3	-	-	3	40	60	100
17AEC24	Linear IC Applications Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC25	Digital IC Applications Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC26	Analog Communications and Digital Communications Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC27	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AEC80	MOOC - I									
Total				**18**	**4**	**9**	**23**	**360**	**640**	**1000**

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III B.Tech., II SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AEC30	Microwave Engineering	PC	Core	3	1	-	3	40	60	100
17AEC31	Electronic Measurements and Instrumentation	PC	Core	3	1	-	3	40	60	100
17AEC28	Digital Signal Processing	PC	Core	3	1	-	3	40	60	100
17AEC32	VLSI Design	PC	Core	3	1	-	3	40	60	100
17AEC _ _	* Professional Elective-II	PE	Elective	3	-	-	3	40	60	100
17A_ _ _ _	**Open Elective-I	OE	Elective	3	-	-	3	40	60	100
17AEC33	Digital Signal Processing Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC35	Microprocessors and Microcontrollers Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC36	VLSI Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC37	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AEC81	MOOC - II								-	
Total				**18**	**4**	**9**	**23**	**360**	**640**	**1000**

IV B.Tech., I SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AEC38	Embedded Systems	PC	Core	3	1	-	3	40	60	100
17AEC39	Optical Communications	PC	Core	3	1	-	3	40	60	100
17AEC40	Radar Systems	PC	Core	3	1	-	3	40	60	100
17AEC _ _	*Professional Elective-III	PE	Elective	3	1	-	3	40	60	100
17AEC _ _	*Professional Elective-IV	PE	Elective	3	-	-	3	40	60	100
17A_ _ _ _	**Open Elective-II	OE	Elective	3	-	-	3	40	60	100
17AEC41	Microwave and Optical Communications Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC42	Embedded Systems Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC66	Mini Project	-	Skill	-	-	2	1	40	60	100
17AEC82	MOOC - III									
Total				**18**	**4**	**8**	**22**	**360**	**540**	**900**

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IV B.Tech., II SEMESTER

Course Code	Course Name	Subject Area	Category	Periods per week			Credits	Scheme of Examination Max. Marks		
				L	T	P		CIA	SEE	Total
17AEC67	Internship	-	-	-	-	-	3	-	100	100
17AEC _ _	*Professional Elective - V	PE	Elective	3	-	-		40	60	100
17AEC _ _	*Professional Elective -VI	PE	Elective	3	-	-	3	40	60	100
17AEC78	Comprehensive Viva-Voce	-	Skill	-	-	-	2	-	100	100
17AEC79	Project Work	-	-	-	-	20	12	40	60	100
Total				**6**	**-**	**20**	**20**	**120**	**280**	**400**

*Refer to Professional Elective Course list Appended.

**Refer to Open Elective Course List Appended

*** Refer to Audit Course list Appended

***PROFESSIONAL ELECTIVE –I**		
Course Code	**Course Name**	**Offering Department**
17AEC46	Material Science	ECE
17AEC47	MEMS	ECE
17AEC48	Computer Architecture	ECE
17AEC49	Medical Electronics	ECE
17AEC50	Information Theory and Coding Techniques	ECE
***PROFESSIONAL ELECTIVE –II**		
Course Code	**Course Name**	**Offering Department**
17AEC51	Telecommunication Switching Systems and Networks	ECE
17AEC52	Wireless Networks	ECE
17AEC54	Digital Design through Verilog HDL	ECE
17AEC55	Multimedia Compression Techniques	ECE
17AEC56	Computer Communication Networks	ECE

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***PROFESSIONAL ELECTIVE –III**		
Course Code	**Course Name**	**Offering Department**
17AEC57	RF System Design	ECE
17AEC59	Microwave Integrated Circuit Design	ECE
17AEC60	Electromagnetic Interference and Compatibility	ECE
17AEC45	Digital Image Processing	ECE
17AEC61	Adhoc Networks	ECE
***PROFESSIONAL ELECTIVE –IV**		
Course Code	**Course Name**	**Offering Department**
17AEC53	Satellite Communications	ECE
17AEC62	Transducer Engineering	ECE
17AEC63	Modern Operating Systems	ECE
17AEC64	Wireless Communication	ECE
17AEC65	Cellular and Mobile Communication	ECE
***INTERNSHIP / PROFESSIONAL ELECTIVE – V**		
17AEC67	Internship	
17AEC68	Video Analytics	ECE
17AEC69	Advanced Wireless Networks	ECE
17AEC70	Machine Learning and Applications	ECE
17AEC71	CMOS analog IC Design	ECE
17AEC72	Advanced Digital Signal Processing	ECE
***PROFESSIONAL ELECTIVE – VI**		
17AEC73	DSP Processors and Architectures	ECE
17AEC74	Nano Technology and Applications	ECE
17AEC75	Electronics Packaging and Testing	ECE
17AEC76	Mixed Signal IC Design	ECE
17AEC77	Advanced wireless Communication	ECE

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****OPEN ELECTIVE – I**		
Course Code	**Course Name**	**Offering Department**
17AEE23	Soft Computing Techniques	EEE
17ACS40	Cloud Computing	CSE
17ACS41	Network Security Essentials	CSE
17AEE39	Industrial Electronics	EEE
17AME40	Robotics	ME
****OPEN ELECTIVE – II**		
Course Code	**Course Name**	**Offering Department**
17AMB03	Professional Ethics	MBA
17ACS57	Introduction to Internet of Things	CSE
17AME57	Total Quality Management	ME
17AME58	Entrepreneurship	ME
17ACE63	Disaster Management	CE

*****AUDIT COURSE - I**		
Course Code	**Course Name**	**Offering Department**
17AHS10	Quantitative Aptitude and Reasoning I	HAS
17AHS11	Intellectual Property Rights	HAS
17AHS12	Clinical Psychology	HAS
17AHS13	German Language	HAS
*****AUDIT COURSE - II**		
Course Code	**Course Name**	**Offering Department**
17AHS19	Quantitative Aptitude and Reasoning II	HAS
17AHS20	Legal Sciences	HAS
17AHS21	Gender Sensitivity	HAS
17AHS22	French Language	HAS

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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I B.Tech I Semester ECE

Code: 17AHS01 ENGLISH FOR COMMUNICATION I
(Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
3	-	-	3

Objectives:

1. To help students to communicate their ideas effectively to their target audience.
2. To develop LSRW skills.
3. To help students to practice real time language use with the help of technology.
4. To help the students to develop the employability skills.

Outcomes:

1. Students will be able to communicate their ideas effectively to their target audience.
2. Students will be able to develop LSRW skills.
3. Students will be able to utilize technology in their communication.
4. The students will be able to develop the language to meet the demands of industry and corporate world.

In order to improve the skills in LSRW the following course content are prescribed and divided into five units.

UNIT-I Environmental Consciousness: Climate Change- Green cover-Pollution

REMEDIAL GRAMMAR:

1. Articles
2. Prepositions
3. Tenses
4. Sentence Construction-Strategies (avoiding Repetition and ambiguity)

UNIT-II Emerging Technologies: Solar Thermal Power-Cloud Computing-Nanotechnology

REMEDIAL GRAMMAR

1. Sentence Transformation (Degrees, Voice, Speech & synthesis)
2. Common Errors in English
3. Subject + Verb Agreement
4. Modal Verbs, Question Tags

UNIT-III Energy: Renewable and Non-Renewable sources-Alternative sources-Conservation- Nuclear Energy

VOCABULARY:

1. Roots-Prefixes-Suffixes(RPS Method)
2. Synonyms
3. Antonyms

UNIT-IV Engineering Ethics: Challenger Disaster-Biotechnology-Genetic Engineering-Protection From Natural Calamities

VOCABULARY:

1. Phrasal Verbs
2. Idioms
3. One-word substitutes
4. Words often confused

UNIT-V Travel and Tourism: Advantages and Disadvantages of Travel-Tourism-AtithiDevoBhavaTourism in India.

WRITING PRACTICE (COMPOSITION):

1. Paragraph-Writing(Descriptive &Narrative)
2. Precise-Writing
3. Essay Writing, Expansion of Proverbs
4. Note-Making
5. Letter-Writing (Formal &Informal)

Text Books:

Mindscapes, Orient Blackswan.

Reference Books:

1. M. Ashraf RizWi, "Technical English Communication", Tata McGraw Hill, Latest Edition.
2. Basic communication skills for Technology, Andrea J Rutherford, Pearson Education, Asia.
3. Technical communication by Meenakshi Raman Sangeetha Sharma, Oxford
4. Oxford Practice Grammar by John Eastwood , Oxford.
5. English Pronouncing Dictionary by Daniel Jones Oxford.

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I B.Tech I Semester ECE

Code: 17AHS02 DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

(Common to All Branches)	**L**	**T**	**P**	**C**
	3	**1**	**-**	**3**

Objectives:

The objectives of this course are to

1. model a wide range of engineering and practical problems as ordinary differential equations
2. apply fundamental mathematical principles to the real life situations
3. gain the knowledge of mathematics & Engineering problems

Outcomes:

After completion of the course the student will be able to

1. comprehend the areas of Engineering problems & their solutions.
2. gain the knowledge of mathematics in transforming day to day real life problems to different mathematical models.
3. differentiate the rotational and irrotational motions of fluids.

UNIT-I DIFFERENTIAL EQUATIONS:

Linear and Bernoulli's Equations – Non - homogenous Linear Differential equation of second and higher order with constant coefficients with R.H.S terms of the form e^{ax} , $Sin\,ax,\ Cos\,ax,\ x^m,\ e^{ax}V(x), x^mV(x)\ and\ x\,V(x)$. Newton's law of cooling, **L**-R- C circuits, bending of beams.

UNIT-II FUNCTIONS OF SEVERAL VARIABLES:

Maxima and Minima for functions of two variables –Lagrange's method of multipliers of 3 variables only. Taylor's and Maclaurin's series expansion of functions of two variables.

Radius of Curvature: Cartesian and polar curves.

UNIT-III

APPLICATIONS OF INTEGRATION: Length of an arc and area using integral.

Multiple Integrals: Double and Triple integrals-Change of variables-Change of Order of Integration (Cartesian and polar forms). Surface area and Volume of solid of revolution.

UNIT-IV

MATRICES - I: Rank of a matrix-Echelon form, Normal form -solution of linear system of homogeneous and non-homogeneous equations -Gauss elimination method. Eigen values and Eigen vectors.Cayley-Hamilton theorem - Linear Transformations - Orthogonal transformations -Diagonalization of a matrix. Quadratic forms- Reduction of Quadratic form to Canonical form and their nature.

UNIT-V

VECTOR CALCULUS: Gradient, Divergence, Curl and their properties (without identities).

Vector Integration: Line Integrals – Potential functions - Area, Surface and Volume integrals -Green's theorem- Stoke's theorem& Gauss Divergence theorems (without proof) – problems onGreen's, Stoke's and Gauss's Theorem.

Text Books:

1. Dr.B.S.Grewal, Higher Engineering Mathematics. Kanna Publications, 40th edition.
2. B.V.Ramana, A Text book of Engineering Mathematics-I, Tata McGrawhill.
3. T.K.V.Iyengar, B.Krishna Gandhi and others, A Text book of Engineering Mathematics –I, S.Chand and company.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics. John Wiley & Sons.2016
2. Thomson, A Text book of Engineering Mathematics, Book Collection
3. N.Bail, M.Goyal&C.Walking, A Text book of Advanced Engineering Mathematics-A computer Approach.
4. E.Rukmangadachari and Keshava Reddy, A Text book of Engineering Mathematics-I, Pearson Education.

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I B.Tech I Semester ECE

Code: 17AHS03 ENGINEERING PHYSICS
(Common To ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
3	1	-	3

Objectives:

1. To develop interest on various phenomenon of light waves like interference, diffraction, amplification of light through stimulated emission, propagation of light with engineering applications.
2. To understand the arrangement of atoms, direction, planes in crystals, structure of crystals and application of Ultrasonics.
3. To learn and understand the basic concepts of quantum mechanics and the merits and demerits of classical and quantum free electron theory.
4. To recognize the mechanism of superconductors and magnetic materials , their properties and applications
5. To acquire knowledge in understanding semiconductors, basic concepts and significance of Nanomaterials, their synthesis and application.

Outcomes:

1. By studying optics, lasers and fiber optics, different realms of physics and their application in both scientific and technological systems are achieved.
2. The crystal properties, periodicity and structure is determined. Crystal defects can be understood using x-rays and various ultrasonic techniques are determined.
3. By understanding the quantum structure of sub-atomic particles, the observation of physical properties exhibited by methods are lifted.
4. The importance of superconducting and magnetic materials and their applications are focused to understand electronic devices.
5. The application of semiconductors and nanomaterials are useful to design electronic devices.

UNIT - I OPTICS:

Interference: Introduction - Interference in thin films by reflection – Newton Rings.

Diffraction: Introduction - Fraunhofer diffraction due to single slit- Diffraction spectra using Grating.

Lasers: Introduction – Laser Characteristics – Spontaneous and stimulated emission of radiation – Einstein's coefficients – population inversion –Ruby laser - He-Ne laser- Semiconductor Laser - Applications of laser.

Fiber optics: Introduction – Principle of optical fiber – Acceptance angle and acceptance cone – Numerical aperture – Classification of Optical Fibers- Attenuation in optical fibers – Optical fiber communication system- Applications of optical fibers.

UNIT – II CRYSTAL STRUCTURES AND X-RAY DIFFRACTION:

Introduction – Space lattice – Basis – Unit cell – Lattice parameters – Crystal systems – Bravais lattices – Structure and packing fractions of Simple cubic, body centered cubic, face centered cubic crystals-Directions and planes in crystals – Miller Indices – Bragg's law – X-ray diffraction by powder method

ULTRASONICS: Introduction – Production of ultrasonic by piezoelectric method – Properties and detection of Ultrasonic waves – Applications of Ultrasonics.

UNIT – III PRINCIPLES OF QUANTUM MECHANICS:

Wave and particles – de Broglie hypotheses –Properties of Matter waves –Heisenberg uncertainity principle- Schrödinger time independent wave equation – Physical significance of wave function – Particle in one dimensional Infinite potential box

Free electron theory: Classical free electron theory – Electrical conductivity – merits and demerits – Quantum free electron theory –merits and demerits - Fermi Dirac distribution - Kronig penny model qualitative only.

UNIT – IV MAGNETIC PROPERTIES:

Introduction and basic definitions – Origin of magnetic moment – Classification of magnetic materials – Hysteresis curve – Hard and Soft Magnetic Materials-Applications.

SUPERCONDUCTORS: General properties of superconductors – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson effect – Application of superconductors.

UNIT – V SEMICONDUCTORS:

Introduction – Intrinsic and extrinsic Semiconductors–Fermi level-Equation of conductivity - Drift and diffusion – Einstein's equation – Hall Effect - Solar Cell.

NANOMATERIALS: Introduction – Significance of Nano scale - Types of nanomaterials- Dimensionality – Growth of nanomaterials: Ball milling method - Sol-Gel method - Chemical

vapor deposition – Properties of nanomaterials: Optical, Electrical, Mechanical and Magnetic - application of nano materials.

Text Books:

1. Avadhanulu and Kshirasagar "A Text book of Engineering Physics" Revised Edition, S.Chand, New Delhi 2014
2. Gaur and Gupta "Engineering Physics" New Delhi, DhanpatRai Publishers, 2010
3. Thyagarajan K "Engineering Physics" Delhi, Tata Mcgraw Hill Publishers, 2013.

Reference Books:

1. Pillai.S.O: Solid State Physics, 6thedition, New Delhi: New Age International, 2005.
2. Chattopadhyay, K. K; Banerjee, A.N "Introduction to Nano Science and Technology" New Delhi: PHI, 2009 .
3. Resnick, Halliday and Walker "Fundamentals of Physics" 9th Edition, New Delhi: Wiley Publishers, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17ACS01 COMPUTER PROGRAMMING IN C
(Common to All Branches)

L	T	P	C
3	-	-	3

Objectives:

The course presents basics of C programming including Data representation, Control Structures, Functions, Arrays, Pointers, Strings, and Files that aims to:

1. Learn the syntax and different types of tokens of C.
2. Organize the user's data for decision making and iterative processes.
3. Access the pointers for efficient utilization of memory.
4. Apply structured programming approach to solve real time applications.

Outcomes:

Upon completion of this course, students will be able to:

1. Apply the paradigms of structured programming to solve different problems.
2. List out the salient features and applications of C programming language.
3. Demonstrate the techniques for implementing applications using C programming.
4. Know how to use basic data structure like array in simple data processing applications.

UNIT – I INTRODUCTION TO COMPUTERS AND PROBLEM SOLVING:

What is computer, Block diagram of a Computer, Hardware Vs Software, Types of Programming Languages, The Problem Solving aspect, Top Down design.

C Fundamentals : The C character set, Variables, Identifiers and keywords, Data types, Constants, Input-Output statements, Structure of a C program, Simple C programs to exchange the values of two variables, Counting the number of factors of a given integer.

Algorithm, Flowchart: Fundamental algorithms- Factorial computation, Greatest Common Divisor computation, Sine function computation, Reversing the digits of an integer, Generating prime numbers.

UNIT – II C STATEMENTS:

Conditional and Unconditional Statements, Iterative Statements: Concept of a loop, Pre-test and Post-test loops, Event and Counter Controller loops, Operators- Classification of operators, Expressions- Precedence and Associativity, Evaluation of Expressions, Standard library functions.

Functions: Defining a function, Accessing a function, Function prototypes, Passing arguments to a function, Parameter passing mechanisms - Call-by-value, Call-by-reference, Recursion, Storage classes (auto, static, register, extern).

UNIT – III ARRAYS:

Declaration and Definition of an array, Processing an Array, Passing arrays to functions, Two-dimensional and Multi-dimensional arrays, Array techniques-Array order reversal, Removal of duplicates from an ordered array.

Strings: Defining and Initialization of Strings, NULL character, Reading and Writing a string ,Processing the string , String handling functions.

UNIT – IV POINTERS:

Fundamentals, Pointer declarations, Pointers and One-dimensional array, Dynamic memory allocation, Operations on pointers, Arrays of pointers, Pointers for Inter function communications.

Structures and Unions: Declaration, Definition and Initialization of structures, Accessing structures, User-defined data type (typedef), Enumerated Data types, Nested structures, Array of structures, Structures and pointers, Passing structures to functions, Unions.

UNIT – V FILES:

Significance of files, Opening and Closing a data file, Reading and Writing a data file, Processing a data file, Concept of text files and binary files, File handling functions, Additional features – Command line parameters, Preprocessor directives.

Text Books:

1. Behrouz A. Forouzan, Richard F. Gilberg, “C Programming & Data Structures”, India Edition, Course Technology, 2010.
2. R.G. Dromey, “How to Solve it by Computer”, Low Price Edition, Pearson Education India, 2008.

Reference Books:

3. Elliot B. Koffman , Jeri R. Hanly , Ashok Kamthane , A. AnandaRao, “Programming in C and Data Structures”, First Impression, Pearson Education India, 2009.
4. E Balagurusamy, “Programming In C And Data Structures", Fourth Edition, McGraw-Hill Education, 2014.
5. Yashavant P Kanetkar, “Let Us C, 12th Edition, BPB Publications, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17AEE02 NETWORK THEORY
(Common to ECE, ETE & EE)

L	T	P	C
3	1	-	3

Objectives:

1. To understand the nature of different circuit elements, fundamental laws and network theorems, Electrical Circuit analysis.
2. To gain knowledge of phasor concepts in single phase AC circuits.
3. To study the transient analysis and two-port parameters.

Outcomes:

After completion of this course, the student will be able to:

1. Demonstrate knowledge of fundamental laws and network theorems.
2. Develop phasor diagrams of AC circuits.
3. Analyze the transient behavior of electrical circuits.

UNIT – I GENERAL ASPECTS OF ELECTRICAL CIRCUITS:

Circuit Concept – RLC parameters – Voltage and Current sources – Independent and dependent sources - Source transformation – Voltage – Current relationship for passive elements - Kirchhoff's laws – Network reduction techniques – series, parallel, star-delta transformations - Node and Mesh analysis - Concept of super node and super mesh.

UNIT – II SINGLE PHASE A.C CIRCUITS:

Concept of AC circuits **:** R.M.S and Average values – Form factor and Crest factor, Phase relation in R, L and C circuits, series and parallel circuits –impedance and power triangle, power factor, Resonance – series, parallel circuits, concept of bandwidth and Q factor.

UNIT – III NETWORK THEOREMS:

Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer and Compensation theorems for DC and AC excitations.

UNIT - IV TRANSIENT ANALYSIS:

Transient response of RL, RC, RLC circuits (Series combinations only) for DC and sinusoidal excitations – Initial conditions - Solution using differential equation.

UNIT – V TWO PORT NETWORK PARAMETERS:

Two port network parameters – z, y, transmission and hybrid parameters and their relationships – Conditions for symmetry and Reciprocity - Inter connection of two port networks in series, parallel and cascaded configurations.

Text Books:

1. Ravish R. Singh: Network Analysis and Synthesis, Tata Mc-graw Hill Company, 1st Edition, 2013.
2. AbhijitChakrabarti: Circuit theory, DhanpatRai& Co, 2nd Edition, 2015

Reference Books:

1. William Hayt and Jack E. Kimmerly: Engineering circuit analysis, McGraw Hill Company, 7th Edition, 2007.
2. Alexander and sadiku: Fundamentals of Electric circuits, Mcgraw Hill, 6th Edition, 2017.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17AME02 COMPUTER AIDED ENGINEERING DRAWING
(First Angle Projection)
(Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
1	-	4	3

Objectives:

The student is exposed to:

1. The importance of Engineering Drawing and get enhanced imagination capacity.
2. The use of computer software for Engineering Drawing.
3. The Use of Drawing instruments for sketching, for computerization.
4. The principles of projections of points, lines, planes and solids.
5. To visualize sectioned and development of objects.
6. The principles of orthographic projections and multiple views of the same.

Outcomes:

After completion of this course, the student will be capable to:

1. Communicate his/her ideas effectively by using orthographic projections in computer software.
2. Develop engineering drawing shapes in AutoCAD.
3. Compile the projection of points, lines, planes and solids then create virtual drawings by using computer.
4. Analyze the various sectional views and develop the surfaces of engineering objects.
5. Use the BIS and create drawings.
6. Elaborate the Conversion of 2D to 3D and vice-versa.

INTRODUCTION:

1. Information about sketch book and allotment of marks for both sketching and computer execution work.
2. AutoCAD commands and use of limits, units and dimensioning the views on computer.
3. Orthographic projections - Principles of projection – both first and third angle and symbols.
4. Practicing on computer (first classes).

5. All the problems are to be solved on the sketch book and after it is checked by the instructor, it should be executed on the computer.

Theory:

UNIT-I

Geometrical constructions – construction of polygons (inscribing, circumscribing), special methods– circle-tangents, Conics-ellipse, parabola, hyperbola -properties of conics, special methods of construction.

UNIT-II

Projections of points – Projections of straight lines- lines inclined to both the principal planes, determination of true length, traces and true inclinations.

UNIT-III

Projections of planes – inclined to both the principal planes.

Projection of regular solids – prisms, Pyramids, cylinders, tetrahedron and cones – axis inclined to one plane.

UNIT-IV

Sections of solids such as prisms, pyramids, cylinders, tetrahedron and cones (solids in simple position) – True shape of the section.

Development of surfaces of simple solids, as above and part solids.

UNIT-V

Principles of isometric projection – isometric scale – isometric projection of planes and solids – conversion of orthographic views into isometric views and vice- versa.

Practice:

1. Geometrical constructions:

a) Sketching of polygons - Triangles, Square, Rectangle, Pentagon, Hexagon, Circle at different positions.

b) Sketching of Tangents to the circles.

2. Conics:

Constructions of Ellipse, Parabola, Hyperbola

3. Points:

Drawing the quadrants and positioning of the points with reference to H.P & V.P with dimensions.

4. Lines:

a) Sketching of lines when they are
   i. Parallel to both H.P & V.P
   ii. Parallel to V.P/H.P and perpendicular to H.P /V.P
   iii. Parallel to V.P/H.P and inclined to H.P /V.P
   iv. Inclined to both the planes

b) Sketching of the line to measure true length & true inclinations

c) Sketching of the line to determine the traces

5. Planes:

Sketching of the planes when they are
   a) Perpendicular to V.P/H.P and parallel to H.P /V.P
   b) Inclined to V.P/H.P and perpendicular to H.P /V.P
   c) Perpendicular to both V.P and H.P.
   d) Inclined to both V.P and H.P.

6. Solids:

a) Sketching of 2D shapes and convert it to 3D solids (Prisms, Pyramids, cube, cylinder, one, tetrahedron)

b) Sketching of projections of solids when the position of axis is
   i. Perpendicular to V.P/H.P and parallel to H.P /V.P.
   ii. Inclined to V.P/H.P and parallel to H.P /V.P.
   iii. Parallel to both V.P and H.P.

7. Sections of solids:

a) Different types of hatching on the polygons.

b) Sketching of sections of solids when the section/cutting plane is
   i. Parallel to V.P/H.P and perpendicular to H.P /V.P.
   ii. Inclined to V.P/H.P and perpendicular to H.P /V.P.
   iii. Perpendicular to both principal planes.

c) Sketching of sections when the cutting plane passing through different positions- base, axis, corner, apex/vertex, generator, lateral edge.

d) Sketching of true shapes.

8. Development of surfaces:

Sketching of developed surfaces of

a) cylinder, prisms using parallel line method

b) cone, pyramids using radial line method

c) truncated solids and frustum

9. Orthographic Projections:

Sketching of 2D views of front, top and side views of 3D objects.

10. Isometric projections:

a) Setting of isometric grid

b) Sketching of isometric views of 3D models / shapes.

Text Books:

1. K. L. Narayana and S. Bheemanjaneyulu, Engineering Drawing with AutoCAD 2016, New Age Publishers, New Delhi, 2017.

2.BasantAgrawal and C.M.Agrawal, Engineering Drawing, McGraw Hill Education 2e

Reference Books:

1. K.Venugopal, Engineering Drawing and Graphics + AutoCad , New Age International (P) Ltd,Publishers, New Delhi, Fourth Edition

2. SiddiqueeArshad. N., Zahid A. Khan, Mukhtar Ahmad,Engineering Drawing: With primer on AUTOCAD, PHI Learning Pvt. Ltd.,

Internal examination : (Max 40 Marks)

Average day-to-day evaluation= 20 marks

Internal Test = 20 marks

Internal Test Question paper pattern **(Max 20 Marks)**

Paper setting: Answer any two out of three questions. Prepare sketches to scale in the sketch book and later on execute in the computer using AutoCAD. 10 marks for work in the sketch book and 10 marks for computer work.

1. First question from unit I or Unit II, Second question from Unit III or Unit IV, Third question from Unit V.
2. Internal exam duration 2 Hours.

External /Final examination Question paper pattern **(Max 60 Marks)**

(Internal Evaluation & Paper setting)

Paper setting:

1. Answer any three out of five questions. Prepare sketches to scale in the sketch book and later on execute in the computer using AutoCAD. 30 marks for work in the sketch book and 30 marks for computer work.
2. Five questions with one question from each unit.

3. Final exam duration 3 Hours.

MAPPING of COs with POs:

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO 10**	**PO11**	**PO12**
CO1	1	2			3					1		
CO2	1				3							2
CO3		1			2							2
CO4		2		2								
CO5				2				3	1			
CO6			2	1								

Competency addresses outcome: - 1 = slightly; 2 = moderately; 3 = substantially

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17AHS07 COMMUNICATION SKILLS LAB
(Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
-	-	2	1

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

Objectives:

1. To train students to use language effectively in everyday conversations, to participate in group discussions to help them face interviews, and sharpen public speaking skills.
2. To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.

Outcomes:

1. The students will be able to recognize English sounds- Monopthongs, Diphthongs and consonantal sounds.
2. The students will be able to use correct Pronunciation in English.
3. The students will be able to differentiate between Received Pronunciation and varieties of English.
4. The students will be able to apply proper stress pattern in speaking English language.

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

I PHONETICS:

Organs of speech, speech mechanism, vowels, consonants, diphthongs, syllable division, word stress, intonation, phonetic transcription with support of speech solutions,

II TENSES:

Speaking of past, present & Future, Role play.

III INFORMAL CONVERSATIONS:

Situational conversation

- Greeting/Self-introduction
- Expressing the cause of something
- Describe a current situation
- Speaking traditions/customs/public issues
- Making plans for vacation
- Expressing of emotions
- Shopping –bargaining price and making purchases

IV FORMAL CONVERSATIONS:

Situational conversation

- Making an appointment
- Naming foods and describing tastes
- Reporting other person's messages
- Requesting
- Asking for directions and describing
- Making suggestions, agreements and refusals

V GROUP DISCUSSIONS:

Do's and Don'ts of a G.D. speaking on Knowledge based, controversial or abstract topics. Prescribed software for Practice : Sky Pronunciation, Pro-power 2 & Globarena.

Reference Books:

1. A Text Book of English Phonetics for Indian students by T. Balasubramaniyam, Macmillan Ltd., 2000.
2. Sasikumar.V and P.V. Dhamija, Spoken English: A Self-Learning Guide to Conversation Practice. 34th Reprint. Tata MCGraw Hill. New Delhi, 1993.
3. Spoken English, R.K. Bansal and J.B. Harrison, Orient Longman 2006 Edn.
4. Speaking English Effectively, Krishna Mohan & NP Singh (Macmillan)
5. Body language- Your success Mantra, DrShaliniVerma, S. Chand & Co, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17AHS08 ENGINEERING PHYSICS LAB
(Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
-	-	3	1.5

Objectives:

1. To understand the phenomenon of light like interference, diffraction and dispersion.
2. To understand the role of optical fiber parameters and signal losses in communication
3. To learn the diffraction studies related to application of laser.
4. To understand the application of B-H curve.

Outcomes:

1. The importance of optical phenomenon like interference and diffraction of light is recognized.
2. The practical knowledge of optical fiber, semiconductor, magnetic materials, lasers and their relative parameters are obtained.
3. The importance of optical fibers is recognized in the field of communication.

A minimum of 10 experiments to be conducted during the academic year

1. Determine the wavelengths of given light source - Spectrometer.
2. Dispersive power of prism
3. Determine the thickness of thin wire by Interference.
4. Determine the wavelength of given laser source – Diffraction grating.
5. Determine the radius of curvature of given plano convex lens by forming Newton Rings.
6. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
7. Numerical Aperture of an optical fiber.
8. Bending losses in Optical Fiber.
9. Determine the wavelength of Laser source using optical fiber.
10. Determine Hall Coefficient and Carrier concentration of the given Semiconductor.
11. Determine the energy loss of ferromagnetic sample by plotting B-H curve
12. Energy gap of a given semiconductor.
13. Determination of lattice constant using x-ray diffraction spectrum.
14. Determine the particle size using laser source.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech I Semester ECE

Code: 17ACS02 COMPUTER PROGRAMMING LAB
(Common to All Branches)

L	T	P	C
-	-	3	1.5

Objectives:

The main objective of conducting this laboratory is to enable the students to:

1. Understand the various concepts of C language such as branching, loops, functions, input/output, expression evaluation, arrays, pointers and files.
2. Apply the syntax of control and looping statements.
3. Solve problems of repetitive nature using loop structures.
4. Distinguish the user defined data types such as typedef and enum and derived data types such as structures and unions.

Outcomes:

After performing this laboratory, the students will be able to:

1. Confidently work n any C programming development environment.
2. Predict the behavior of variables using different types of storage classes.
3. Use files concept to read / write data in secondary storage area.
4. Develop programs by applying the derived data types such as structures, unions and pointers.

Week 1

a) Write a C Program to exchange the values of two variables with a temporary variable and without using a temporary variable.
b) Write a C program to generate the prime factors of a given positive integer.
c) Write a C program to find the cosine value of a given integer by using mathematical function.

Week 2

a) Sum of the individual digits means adding all the digits of a number. Ex: 123, sum of the digits is 1+2+3 = 6. Write a C program to find the sum of individual digits of a positive integer.
b) A Fibonacci sequence is defined as follows: the first and second terms of the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate first n terms of the sequence.

c) Prime number is a number in which is exactly divisible by one and itself only.
Ex: 2, 3, 5, 7, ...
Write a c program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 3

a) Write a C program to convert the Celsius temperature into Fahrenheit temperature or vice versa by using a standard formula.
b) Write a C program to construct a pyramid of numbers.
c) Write a C program to generate Pascal's triangle.

Week 4

a) Write a C program to calculate the following: Sum = $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$
b) Write a C program, which takes two integer operands and one operator from user, performs the operation and then prints the result.(consider the operators +, - , *, / , % and use the **switch** Statement).

Week 5

a) Write a C program that uses both recursive and non-recursive functions
   i. To find the factorial of a given integer. Factorial of a number is nothing but the multiplication of numbers from a given number to 1.
   ii. To find the GCD (Greatest Common Divisor) of two integers. GCD means Greatest Common Divisor. i.e. the highest number which divides the given numbers.
   Ex: GCD (12,24) is 12.
   Formula: GCD = product of numbers / LCM of numbers.
b) Towers of Hanoi problem means we have three towers here source, intermediate and destination. We have to transfer all the disks from source to destination towers. Here the restriction is not to place a big disk on the smaller one and for this we use the intermediate tower. Finally the arrangements in the destination tower must be same as the disks in the source tower at first.
   Write a C program that use recursive function to solve the Towers of Hanoi problem.

Week 6

a) Write a C Program to find the largest and smallest number in a list of integers using arrays.

b) Write a C program that uses functions to perform the following using arrays:

i) Addition of Two Matrices ii) Multiplication of Two Matrices

Week 7

a) 2's Compliment of a number is obtained by scanning it from right to left and complimenting all the bits after the first appearance of a 1. Thus 2's Compliment of 11100 is 00100.

Write a C program to find 2's Compliment of a binary number.

b) In converting the Roman numeral to its equivalent decimal number, we have to take ROMAN value as input and this value is converted into its equivalent decimal number.

Write a C program to convert the given Roman numeral to its decimal equivalent.

Week 8

a) Write a C program that uses functions to perform the following operations:

i. To insert a substring into a given main string from a given position.

ii. To delete n characters from a given position in a given string.

b) Write a C program to determine whether the given string is Palindrome or not.

Week 9

a) Write a C program that displays the position or index in the string S where the string T begins, or 1 if S doesn't contain T.

b) Write a C program to count the lines, words and characters in a given text.

Week 10

Write a C program that uses functions to perform the following operations:

i) Reading a complex number

ii) writing a complex number

iii) Addition of two complex numbers

iv) Multiplication of two complex numbers

(Note: Represent complex number using a structure)

Week 11

a) Write a C program to display the contents of a file.

b) Write a C program which copies the contents of one file to another.

Week 12

a) Write a C program to reverse the first n characters in a file.

b) Write a C program to merge two files into a third file (i.e., the contents of the first file.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS09 NUMERICAL AND TRANSFORM TECHNIQUES
(Common to All Branches)

L	T	P	C
3	1	-	3

Objectives:

The objectives of this course are to

1. Conceptualize the basics of interpolation, partial differential equations Integral and Z transforms.
2. Formulate Mathematical models for a wide range of Engineering and practical problems.
3. Apply fundamental Mathematical methods as well as computational techniques to the problems of Engineering and scientific practice.

Outcomes:

After completion of the course the student will be able to

1. Gain mathematical skills to apply for real life situations.
2. Cater the needs of Mathematics to engineering oriented problems.
3. Solve any practical problem using Mathematical techniques.

UNIT-I SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS:

Introduction - The Bisection method- The method of false position - Newton - Raphson method. **Interpolation:** Forward Differences - backward differences-Newton's forward and backward differences formulae for interpolation - Lagrange's interpolation formula - Inverse interpolation .Cubic Spline interpolation.

UNIT-II NUMERICAL DIFFERENTIATION

First and second order derivatives- . **Numerical integration**-Trapezoidal rule - Simpson's1/3 rule and 3/8 th Rule- **Numerical solutions of ordinary differential equations** by Taylor's series-Picard's method of successive Approximations - Euler's and Modified Euler's Method – Runge-Kutta Methods – Predictor - corrector method - Milne's method.

UNIT-III LAPLACE TRANSFORMS:

Laplace transforms of standard functions - First Shifting Theorem - Transforms of derivatives and integrals- Unit step Function – Second Shifting Theorem –Laplace transforms of Periodic

functions – Inverse Laplace transforms - Convolution theorem. Applications of Laplace Transforms to ODE

UNIT-IV FOURIER SERIES:

Fourier series- Even and odd functions-Fourier series in an arbitrary interval -Half-range Fourier sine and cosine expansions. Fourier integral theorem (statement) - Fourier sine and cosine integrals. Fourier Transforms - Fourier sine and cosine Transforms.

UNIT-V PARTIAL DIFFERENTIAL EQUATIONS:

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Method of separation of variables - solution of one dimensional wave equation, heat equation and two – dimensional Laplace's equation.

Z-TRANSFORMS: Inverse Z- transforms – Properties - Damping rule- Shifting rule - Initial and final value theorems. Convolution theorem - Solution of difference equations by Z-transforms.

Text Books:

1. Dr.B.S.GREWAL, Higher Engineering Mathematics. Kanna Publications, 40th edition.
2. B.V.Ramana, A Text Book Of Engineering Mathematics-I, TATA MC GRAWHILL
3. E. RUKMANGADACHARI AND KESHAVA REDDY, A Text Book of Engineering Mathematics-I, PEARSON EDUCATION.
4. T.K.V.IYENGAR, B.KRISHNA GANDHI AND OTHERS, A Text Book Of Engineering Mathematics –I,S.Chand and Company.

Reference Books:

1. Erwin Kreyszig, Advanced Engineering Mathematics. JOHN WILEY & SONS-2016.
2. Jain.M.K, Iyengart.K.V,.Jain.R.K. Numerical Methods For Scientific And Engineering Computation. Newage International Publishers.
3. N.Bail, M.Goyal&C.Walking, A Text Book Of Advanced Engineering Mathematics-A Computer Approach.
4. Pal, Mathematical Methods, Oxford University Press, 2009.
5. S.S. Sastry, Introductory Methods of Numerical Analysis, Printice Hall of India publications, 2012.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS04 ENGINEERING CHEMISTRY
(Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
3	-	-	3

Objectives:

1. To study the effect of hard water and its treatment for various purposes, corrosion and control of metallic materials,
2. To study the engineering materials such as high polymers namely plastics, rubbers and their preparation, properties and applications along with lubricants, refractories with its applications.
3. To study the calorific value of fuels, combustion of fuels, working of batteries, recharging of batteries, application of different fuel cells.

Outcomes:

After completion of the course students will be able to

1. Understand the impact of hard water and its removal, formation of corrosion, effect of corrosion and to know the designing of corrosion resistant articles.
2. Know the selection of suitable engineering materials for specific applications.
3. Know the selection of suitable fuels based on calorific value for a particular application, calculation of air requirements for combustion of fuel
4. Gain knowledge on using electrochemical cells.

UNIT - I WATER TECHNOLOGY

Sources of water, impurities in water, Hardness of Water and its unit of expression – Estimation of hardness in water by EDTA titration method – Numerical problems-Boiler troubles and prevention methods, Water softening methods by Internal conditioning and External conditioning methods–Chlorination Of Domestic Water Treatment - Desalination of Brackish Water – Reverse Osmosis and distillation methods.

UNIT – II MATERIALS CHEMISTRY

High Polymers:

Polymers- Definition – Nomenclature of polymers- Types of polymerization reactions – addition, condensation and copolymerization with examples. Plastics: Thermoplastics and

thermosetting plastics and differences between them –Preparation, Properties and Engineering applications of PE, PTFE, PVC, Nylon and Bakelite.

Rubbers: Natural Rubbers – Vulcanization – Synthetic Rubbers (Buna-S, Silicone Rubber, Neoprene)–Preparation, properties and applications.

Lubricants: Functions of Lubricants – Classification of Lubricants –various properties of Lubricants.

Refractories: Important properties of refractories and their applications.

UNIT – III CHEMISTRY OF CORROSION

Introduction on corrosion- causes and consequences of corrosion – Types of corrosion - Mechanism of corrosion - Factors influencing the corrosion – Control of corrosion – Cathodic protection by Sacrificial anodic and Impressed current cathodic protection- Electro Plating and Electroless plating (Copper and Nickel).

UNIT – IV FUELS AND COMBUSTION

Fuels: Classification of Solid, Liquid and Gaseous fuels –Analysis of coal - Proximate and Ultimate analysis, Preparation of synthetic petrol – Bergius process - Calorific value – HCV, LCV - Numerical problems using Dulong-Petit's formula – Measurement of calorific value using Bomb calorimeter and Junkers gas calorimeter – Numerical problems.

Combustion: Calculation of air quantity requirement for Combustion -Numerical problems.

UNIT–V ELECTRO CHEMICAL ENERGY SYSTEMS

Electrochemical Cells – Electrode potential - Standard electrode potential – Working principles and applications of different batteries – Dry cell, Lithium-ion cell, Lead-acid cell and Nickel-cadmium cell- with discharging and Recharging reactions, Working principles and applications of hydrogen-oxygen fuel cell, Methanol-oxygen fuel cell.

Text Books:

1. Jain & Jain, A text book of Engineering Chemistry, DhanpatRai Publishing Company, 15th edition, New Delhi, 2008.
2. Prof. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah, Chemistry for Engineers, McGraw Hill Higher Education Hyd., 3rd edition, 2009.
3. Dr. K. RaviKrishnan, A text book of Engineering Chemistry, Sri Krishna Publications, Secunderabad, Telengana, New edition. July, 2015.

Reference Books:

1. N.Krishnamurthy, P.Vallinayagam, D.Madhavan, Engineering Chemistry, (second edition),PHI Learning Pvt Ltd, New Delhi, 2008
2. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, Engineering Chemistry, Scitech Publications (India) Pvt. Limited, Hyderabad, 2009.
3. C.V. Agarwal, C. Parameswara Murthy and Andra Naidu, Chemistry of Engineering Materials, BS Publications, Hyderabad, 9th edition, 2006.
4. S.S. Dara and S.S.Umare, A text book of Engineering Chemistry, S. Chand & Co. Ltd., 12^{th} edition, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS05 ENVIRONMENTAL STUDIES
(Common to ME, AE, ECE, ETE & EE)

L	T	P	C
3	-	-	3

Objectives:

1. To create awareness in engineering graduates about the importance of the environment, effect of technology on environment and ecological balance and make them sensitive to environment problems in their future endeavors.
2. To understand the importance of protecting natural resources, pollution caused due to inventions by engineers and save the future generations from environmental degradation and pollution.

Outcomes:

After completion of the course the student

1. Will be able to understand what constitutes the environment, how to conserve the precious resources and maintain the ecological balance. They will be aware of maintain the ecological balance based on the cultura**l** and biological diversity
2. Can realize the importance of ecosystem, biodiversity and its conservation.
3. Will be able to identify the major pollutants and abatement devices in order to protect the environment from pollution for effective environmental management.
4. Will be Capable of managing social issues related to the environment and be aware of the enforcement of environment acts in our constitution.
5. Will be able to analyse of the population growth and its effect on environment and human health.

UNIT-I ENVIRONMENT AND NATURAL RESOURCES:

Definition, Scope and Importance, Need for Public Awareness - Components of Environment(Atmosphere, Hydrosphere, Lithosphere and Biosphere) –Natural resources and associated problems- **Forest resources:** Use and over-exploitation, deforestation, case studies– Timber extraction, Mining, Dams and other effects on forest and tribal people- **Water resources:** Use and over utilization of surface and ground water, Floods, Drought, conflicts over water, dams-benefits and problems- **Food resources**: World food problems, Sources, changes caused by agriculture and overgrazing, impacts of modern agriculture,

fertilizer-pesticide problems, water logging, salinity, case studies. **Energy resources:** Renewable and Non-renewable energy resources

UNIT-II ECOSYSTEMS AND BIODIVERSITY:

Concept of an ecosystem, Structure and function of an ecosystem – Producers, Consumers and decomposers – Energy flow in the ecosystem – Food chains, food webs and ecological pyramids – Ecological Succession - Introduction, types, characteristic features, structure and function of the following ecosystems: Forest- Grassland-Desert-Aquatic (ponds, streams, lakes, rivers, oceans, estuaries)- Introduction to biodiversity: Definition, types(genetic, species and ecosystem diversity)-Bio-geographical classification of India-Value of biodiversity(Consumptive use, Productive use, Social use, Ethical use, Aesthetic and Option values)- India as a mega diversity nation-Hot spots of India-Threats to biodiversity(habitat loss, Poaching of wildlife, man-wildlife conflicts)- Conservation of biodiversity(In-situ and Ex-situ conservation of biodiversity).

UNIT-III ENVIRONMENTAL POLLUTION:

Definition, causes, effects and control measures of: a. Air Pollution b. Water Pollution c. Soil Pollution d. Noise Pollution e. Thermal Pollution f. Nuclear hazards, Solid Waste Management: Causes, effects and control measures of urban and industrial wastes- Role of an individual in prevention of pollution- Pollution case Studies- Environmental Impact Assessment- Disaster management: Floods, Earthquake, Cyclone, Landslides and Tsunamis - Field Trip- Visit to a local polluted site- Urban/Industrial etc.

UNIT-IV SOCIAL ISSUES AND THE ENVIRONMENT:

From unsustainable to sustainable development- Water conservation(rainwater harvesting, watershed management), Cloud seeding-Resettlement and rehabilitation of people its problems and concerns, case studies- Environmental ethics-Issues and possible solutions-Climate change, global warming, acid rain, ozone layer depletion-Act's: Environment Protection Act-Air (Prevention and Control of Pollution) Act-Water (Prevention and control of Pollution) Act-Wildlife Protection Act-Forest Conservation Act.

UNIT-V HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nation, Population explosion-Family Welfare Programme-Environment and human health-Human Rights-Value Education-HIV/AIDS-

Women and Child Welfare-Role of Information Technology in Environment and human health.

Text Books:

1. Benny Joseph, Environmental Studies, McGraw Hill Publications, 2nd Edition, 2016.
2. Kaushik, Anubha&Kauhsik, C.P., Environmental Science (As per the latest syllabus JNTU, Anantpur), New Age International Publishers, 5th Edition, 2016.
3. Dr. A. Ravikrishnan, Environmental Sciences (JNTU Anantapur), Sri Krishna Hitech Publishing company Pvt Ltd, 2016.

References:

1. G. Tyler Miller and ScotttSpoolman, Environmental Science, Cengage Learning Publishers, 15th Edition, 2015.
2. Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering and Science, Prentice Hall, 3rd Edition, 2007.
3. Cunningham, W. P. Cooper, T. H. Gorhani, Environmental Encyclopedia, Jaico publications, Mumbai, 2001.
4. ErachBharucha, Textbook of Environmental Studies for UGC, University Press, 2005.
5. B.K.Sharma Environmental Chemistry, Krishna Prakashan Media (p) Ltd, 2011.
6. V.P. Kudesia Environmental Chemistry, PragatiPrakashan Publications, 2nd edition, Meerut, 2003

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY, (AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AEC01 ELECTRONIC DEVICES AND CIRCUITS
(Common to ECE, ETE, EE, EEE, CSE, CSSE and IT)

L	T	P	C
3	1	-	3

Objectives

1. To understand operation of various Electronic devices such as Diodes, BJT, JFET AND MOSFET.
2. To understand various applications of diode and special purpose electronic devices.
3. To understand the design of various biasing and amplifier circuits of BJT and JFET.

Outcomes

1. Students will get working knowledge of various Semiconductor Devices like Diode, BJT, JFET, MOSFET, and SCR & UJT.
2. Design and analyze the DC bias circuitry of BJT and FET.
3. Design and analyze basic transistor amplifier circuits using BJT and FET.

UNIT-I SEMICONDUCTOR – DIODE CHARACTERISTIC AND APPLICATIONS

Qualitative Theory of the p-n Junction, The p-n Junction as a Diode, Band Structure of an Open–Circuited p-n Junction, The Current Components in a p-n Diode, Quantitative Theory of the p-n Diode Currents, The Volt – Ampere Characteristic, The Temperature Dependence of p-n Characteristics, Diode Resistance, Space-Charge, or Transition capacitance C_T, Diffusion Capacitance. Zener Diode, V-I Characteristics of Zener Diode. Different types of breakdown.

UNIT-II TRANSISTOR CHARACTERISTICS - BIASING AND THERMAL STABILIZATION

The Junction Transistor, Transistor Current Components, The Transistor as an Amplifier, Transistor Construction, Detailed study of the Currents in a Transistor, The Transistor Alpha. The Common-Base Configuration, The Common-Emitter Configuration, The Common-Collector Configuration. The Ebers-Moll model, The operating point, Analysis of Fixed Bias, Collector-to-Base bias, Emitter–Feedback bias, Collector-Emitter feedback bias and

Self—bias circuits, Stability factor, Bias compensation techniques, Bias Compensation, Thermal Runaway, Thermal Stability.

UNIT-III FIELD-EFFECT TRANSISTORS

The Junction Field-Effect Transistor, The Pinch-Off Voltage $V_{P,}$ The JFET Volt-Ampere Characteristics, The FET Small-Signal Model, Biasing the FET, The FET as a Voltage-Variable Resistor (VVR), Comparison of JFET and BJT, The Metal Oxide Semiconductor Field Effect Transistor (MOSFET) – Enhancement and Depletion Modes-Construction and Volt-Ampere characteristics, Comparison of MOSFET with JFET.

UNIT-IV SPECIAL PURPOSE ELECTRONIC DEVICES:

The Tunnel diode and its characteristics, The p-i-n diode and its characteristics, Point Contact diode, Schottky Barrier diode, Schottky effect and Current-Voltage relation of a Schottky Barrier diode, UJT and SCR characteristics.

UNIT-V PHOTOELECTRIC DEVICES:

Photo-emissivity, Photoelectric Theory, Phototubes, Applications of Photo-devices, Multiplier Phototubes, Photoconductivity, The Semiconductor Photodiode, Multiple-Junction Photo Diodes, The Photovoltaic Effect, The p-i-n Photo-detector, The Avalanche Photo Diode(APD) and Light Emitting Diode (LED)

Text Books:

1. Jacob Millman, Christos C. Halkias and SatyabrathaJit, Millman's Electronic Devices and Circuits, McGraw Hill Education, Fourth Edition, 2016.
2. S Salivahanan and N Suresh Kumar, Electronic Devices and Circuits, McGraw Hill Education, Fourth Edition, 2017.

Reference Books:

1. T.F. Bogart Jr., J.S. Beasley and G. Rico, Electronic Devices and Circuits, Pearson Education, 6th edition, 2008.
2. R.L. Boylestad and Louis Nashelsky, Electronic Devices and Circuits, Pearson / Prentice Hall, 10th Edition, 2009.
3. David A. Bell, Electronic Devices and Circuits, 5th edition, Oxford University Press, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AEE06 ELECTRICAL TECHNOLOGY
(Common to ECE, ETE & EE)

L	T	P	C
3	1	-	3

Objectives:

1. To know operating principles, characteristics of DC machines and transformers.
2. To understand the principle of operation of induction motors and alternator.
3. To know the basic principles of special machines.

Outcomes:

After completion of the course the student will be able to:

1. Demonstrate knowledge in Construction, operation and applications of different types of machines and transformers.
2. Gain knowledge in the operation of induction motor and alternator.
3. Apply various special machines in real time.

UNIT-I DC MACHINES

DC GENERATOR: Review of magnetic circuits - construction and working principle, types, EMF equation, losses, open circuit and load characteristics, applications - problems.

DC MOTOR: working principle, torque equation, characteristics, applications, speed control of shunt motor, Swinburne's test, three point starter-problems.

UNIT-II SINGLE PHASE TRANSFORMER

Working principle of single phase transformer, constructional features, EMF equation, equivalent circuit, losses, efficiency and regulation of transformer, OC and SC test, predetermination of efficiency and regulation - problems.

UNIT-III THREE PHASE CIRCUITS

Introduction to poly phase systems, advantages of polyphase system, generation of three phase voltages, phase sequence, star and delta connections, relationship between phase and line quantities in three phase balanced circuits, power measurement in three phase systems using two wattmeter method - problems.

UNIT-IV THREE PHASE INDUCTION MOTOR AND ALTERNATOR

INDUCTION MOTOR:

Principle of operation, construction and types, slip, rotor frequency, torque, torque-slip characteristics problems.

ALTERNATORS: principle of operation, constructional features, types, EMF equation.

UNIT-V SPECIAL MACHINES

Single phase induction motors - construction, principle of operation (double field revolving theory) and applications of split phase induction motor, capacitor motor, shaded-pole motor. Construction, principle of operation and applications of universal motors and stepper motors.

Text Books:

1. M.S. Naidu and S. Kamakshaiah, Electrical Technology, Tata McGraw-Hill Publishing company Ltd, New Delhi, 2007.
2. V.K.Mehta&Rohit Mehta, Principles of Electrical Engineering, S.Chand publications, 2nd Edition, 2003.

Reference Books:

1. H.Cotton, Electrical Technology, CBS Publishers & Distributors, 7th Edition, 2004.
2. T.K.Nagasarkar, M.S.Sukhija, Basic Electrical Engineering, Oxford University press New Delhi, 2nd Edition, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17ACS03 DATA STRUCTURES
(Common to All Branches)

L	T	P	C
3	-	-	3

Objectives:

The objective of this course is to make students to:

1. Know the difference between linear and non-linear data structures.
2. Introduce various techniques for representation and manipulation of the data in the real world.
3. Learn implementing various data structures Stacks, Queues, Linked Lists, Trees and Graphs.
4. Choose appropriate data structure, sorting and searching technique depending on the problem to be solved.

Outcomes:

At the end of the course students will be able to:

1. Understand different types of advanced abstract data types (ADT), Data structures and their implementation.
2. Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
3. Apply various techniques for representation and manipulation of the data in the real world.
4. Choose appropriate sorting and searching mechanism based on the problem being solved.

UNIT – I INTRODUCTION TO DATA STRUCTURES:

Definition of Data Structures, Abstract Data Type, Classification of Data Structures- Linear and Non-Linear, Applications.

UNIT – II STACKS AND QUEUES

Stacks: Basic Operations, Array representation of stacks, Stack applications - Reversing Data, Infix to Postfix Transformation, Postfix expression evaluation, Other applications of Stacks.

Queues: Basic Operations, Array representation of Queues, Circular Queues, Priority Queue, Dequeue, Applications of Queues.

Dynamic Memory Allocation

UNIT – III LINEAR LIST:

Concepts of Linked Lists, Types of Linked Lists, Basic List Operations, Concatenating two lists, Singly Linked List implementation, Linked representations of Stacks & Queues, Doubly Linked List and its Operations, Circularly Linked List, Application of Linked Lists.

UNIT – IV SEARCHING AND SORTING SEARCHING:

Linear and Binary search methods.

Sorting: Bubble sort, Selection sort, Insertion sort, Quick sort, Merge Sort.

UNIT – V TREES AND GRAPHS TREES:

Basic Tree Concepts, Binary Trees, Binary Tree Traversals, Applications of Binary Trees, Binary Search Trees, Spanning Trees.

Graphs: Introduction, Graph Representation in C, Graph Storage Structures- Adjacency Matrix, Adjacency List, Graph Traversals, Applications.

Text Books:

1. Richard Gilberg, BehrouzForouzan, "Data Structures: A P seudocode Approach with C (Data Structures Series)", Second Edition, Cengage Learning, 2004.
2. GavPai, "Data Structures and Algorithms – Concepts, Techniques and Applications", Tata McGraw Hill, 2008.

Reference Books:

1. A.A.Puntambekar, "Data Structures Using C", First Edition, Technical Publications, 2009.
2. E Balagurusamy, "Data Structures Using C", Tata McGraw-Hill Education, 2013.
3. Ashok N. Kamthane, "Introduction to Data Structures in C", Pearson Education India, 2007.
4. Horowitz, Ellis, Sahni, Sartaj, Anderson-Freed, Susan (2008), "Fundamentals of Data Structure in C", Second Edition, University Press, India.
5. http://nptel.ac.in/courses/106105085/(NPTEL video lectures).

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS06 ENGINEERING CHEMISTRY LAB
(Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
-	-	3	1.5

Objectives:

To make the student understand the

1. Process of estimation of metal ions like Iron by titrimetry and potentiometry. Estimation of Copper, Estimation of hardness of water, water, acidity and alkalinity of water sample.
2. Determination of lubricant properties like viscosity Index, Flash and Fire points, corrosion rates, Preparation of a polymer.
3. Determination of acid strength by using a Ph meter and conductivity meter.

Outcomes:

After completion of practicals, student will be able to

1. Use volumetric analysis for the estimation of metal ions, hardness of water, chlorides in water.
2. The importance of viscosity index, flash point and fire point of lubricants.
3. The use of pH meter, conductivity meter and potentiometer.

Any **TEN** of the following experiments

1. Estimation of Hardness of water by EDTA method.
2. Estimation of Chlorides in Water sample.
3. Determination of acid strength by using a pH meter.
4. Estimation of Copper by EDTA method.
5. Estimation of Ferrous Ion by Potassium Dichromate method.
6. Determination of viscosity of oils through Redwood viscometer No.1.
7. Estimation of Ferrous Ion by potentiometry using standard Potassium Dichromate.
8. Determination of rate of corrosion by weight loss method.
9. Acid- Base titration by Conductometric method.
10. Determination of Alkalinity of water sample.
11. Determination of Flash and Fire point by using Pensky Marten’s apparatus.
12. Preparation of Phenol-Formaldehyde resin.
13. Determination of Acidity of water sample .

Text Books:

1. Vogel's Textbook of Quantitative Inorganic Analysis, ELBS Edition, 1994.
2. Dr K. N. Jayaveera and K.B. Chandra Sekhar "Chemistry Pre-lab manual", S.M. Enterprizes Ltd., 2007
3. Helen Kavitha. P "Chemistry Laboratory Manual", Scitech Publications,2008.

Equipments Required:

1. Glassware: Burettes, Pipettes, Standard Flasks, Beakers, Measuring jars, BOD bottles and Reagent bottles.
2. Electrical Weighing balance
3. Reflux Condensers
4. Pensky Marten's apparatus
5. Redwood viscometer
6. Conductivity meter
7. Potentiometer
8. Gas cylinder
9. pH meter

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AME03 ENGINEERING PRACTICES LAB
(Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
-	-	2	1

Objectives:

1. To understand the basic tools and operations in carpentry & about wood turning Lathe.
2. To understand the basic tools and operations in fitting & various types of joints.
3. To understand the basic tools and operations in sheet metal trades.
4. To understand the basic tools of house wiring & house wiring connections etc.
5. To understand the basic tools and manufacturing processes in a foundry trade.
6. To understand the basic tools and manufacturing processes in welding and welding joints.

Outcomes:

After completion of the study of this lab a student will be able to:

1. Perform a different proto-types in the carpentry trade such as Mortise and tenon joint, and Table stand using woodturning lathe.
2. Know how much time a joint will take for the assessment of time in a Fitting trade such as Dove tail joint and Half Round joint.
3. Make various basic prototypes in the trade of Tin smithy such as rectangular tray, and funnel.
4. perform various basic House Wiring techniques such Stair case wiring (i.e. control of one lamp by two switches fixed at two different places), and wiring for tube light (Fluorescent Lamp)/Focus light.
5. Make a different models in a foundry shop such as single and two pieces pattrens.
6. Make various basic prototypes in the trade of Welding such asT-Joint and H-Join.

1. TRADES FOR EXERCISES:

a. Carpentry shop.

1. Prepare a Mortise and tenon joint from a given 300 x 40 x 25 mm soft wood stock.
2. Prepare a Table stand (desired shape) by using wood turning Lathe from a given 300 x 40 x 25 mm soft wood stock.

b. Fitting shop

1. Prepare a Dove tail joint from a given 100 x 50 x 5 mm M.S. stock.
2. Prepare a Half Round joint from a given100 x 50 x 5 mm M.S. stock.

c. Sheet metal shop

1. Prepare a Funnel from given G.I. sheet.
2. Prepare a Rectangular Tray from given G.I. sheet.

d. House-wiring

1. Stair case wiring (i.e. control of one lamp by two switches fixed at two different places).
2. Prepare a wiring for tube light("Fluorescent Lamp")/Focus light

e. Foundry

1. Prepare a mould for a single piece pattern (Connecting rod)
2. Prepare a mould for a Double piece pattern (Stepped Pulley)

f. Welding

1. Prepare a T-Joint from given M.S Flat pates using Arc Welding.
2. Prepare a H-Joint from given M.S Flat pates using Arc Welding.

2. TRADES FOR DEMONSTRATION:

a. Plumbing
b. Machine Shop
c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

Reference Books:

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
2. Engineering Practices Lab Manual, Jeyapoovan, SaravanaPandian, 4/e Vikas
3. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.
4. Engineering Workshop by Vishnu Universal Learning.
5. Engineering Workshop by GRIE Institute

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17ACS05 DATA STRUCTURES LAB
(Common to All Branches)

L	T	P	C
-	-	3	1.5

Objectives:

The main objective of conducting this lab is to enable the students to:

1. Get practical knowledge of data structures learned in the class room.
2. Extend programming ability using a structured programming approach.
3. Build and manipulate linear and non-linear data structures, including stacks, queues, linked lists, trees and graphs
4. Choose the appropriate data structure to use in solving the typical computer science problems

Outcomes:

After Completing this lab the student must demonstrate the Knowledge and ability to:

1. Demonstrate the application of software engineering principles in design, coding, and testing of large programs.
2. Emphasize the specification of each data structure as an abstract data type before discussing implementations and application of the structure.
3. Aware of the importance of structured programming methods in developing the software.
4. Know the systematic approach to study algorithms , by focuses first on understanding the action of the algorithm then analyzing it

Week 1

Write a C program that implements Stack & Queue operations using arrays

Week 2

Write a C program that uses Stack operations to perform the following

a) Converting Infix expression to Postfix expression.
b) Evaluating the Postfix expression.

Week 3

Write a C program that implements Circular Queue operations using Arrays.

Week 4

Write a C program that implements Dequeue operations using Arrays.

Week 5

Write a C program that implements Stack & Queue operations using Pointers

Week 6

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

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 7

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

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 8

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

i) Creation ii) Insertion iii) Deletion iv) Traversal

Week 9

Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:

i) Linear search ii) Binary search

Week 10

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order

i) Bubble sort ii) Selection sort iii) Insertion sort

Week 11

Write a C program that implements the following sorting method to sort a given list of integers in ascending order:

i) Merge sort ii) Quick sort

Week 12

Write a C program that uses functions to perform the following Binary Tree Traversals

a) In-order b) Preorder c) Post-order

Week 13

Write a C program to implement the following graph traversals

a) Depth-First Search b) Breadth- First Search

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS10 QUANTITATIVE APTITUDE AND REASONING I

(Common for all Branches)

(Audit Course -I)

L	T	P	C
3	-	-	-

Objectives:

The main objectives of this course are

1. To learn the concepts of coding and decoding of letters and numbers.
2. To interpretation data using the graphs.
3. To understand the basic concepts of probability.
4. To comprehend the relation between time and distance in real life problems.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving Time and distance problems.
2. Apply Data interpretation to solve the problems on Line, Bar, Pie graphs.
3. Develop the thinking ability and apply Venn diagram and binary logic.
4. Apply the number series and letter analogies in problems on verbal analogy.

Syllabus for Quantitative Aptitude

Competency 1:

1.1 Numbers

Classification of numbers - Divisibility rules - Finding the units digit - Finding remainders in divisions involving higher powers -LCM and HCF Models.

1.2 Decimal Fractions

1.3 Simplification

1.4 Square Roots & Cube Roots

1.5 Average

Definition of Average - Rules of Average - Problems on Average - Problems on Weighted Average - Finding Average using assumed mean method.

1.6 Problems on Numbers

1.7 Problems on Ages

1.8 Surds & Indices

1.9 Percentage

Introduction - Converting a percentage into decimals - Converting a Decimal into a percentage - Percentage equivalent of fractions - Problems on Percentages

1.10 Profit and Loss & True Discount

Problems on Profit and Loss percentage - Relation between Cost Price and Selling price - Discount and Marked Price –Two different articles sold at same Cost Price - Two different articles sold at same Selling Price - Gain% / Loss% on Selling.

1.11 Ratio and proportion

Definition of Ratio - Properties of Ratios - Comparison of Ratios - Problems on Ratios - Compound Ratio - Problems on Proportion, Mean proportional and Continued Proportion.

Competency 2:

2.1 Partnership

Introduction-Relation between capitals, Period of Investments and Shares.

2.2 Chain Rule

2.3 Time & work

Problems on Unitary method - Relation between Men, Days, Hours and Work -
Problems on Man-Day-Hours method – Problems on alternate days - Problems
on Pipes and Cisterns.

2.4 Time & Distance

Relation between speed, distance and time – Converting kmph into m/s and vice versa - Problems on average speed -Problems on relative speed–Problems on trains -Problems on boats and streams - Problems on circular tracks – Problems on races.

2.5 Mixtures and Allegations

Problems on mixtures - Allegation rule - Problems on Allegation

2.6 Simple Interest

Definitions - Problems on interest and amount – Problems when rate of interest and time period are numerically equal.

2.7 Compound Interest

Definition and formula for amount in compound interest - Difference between simple interest and compound interest for 2 years on the same principle and time period.

2.8 Logarithms

Syllabus For Reasoning

Competency 3:

3.1 Cubes

Basics of a cube - Formulae for finding volume and surface area of a cube - Finding the minimum number of cuts when the number of identical pieces are given - Finding the maximum number of pieces when cuts are given - Problems on painted cubes of same and different colors - Problems on cuboids - Problems on painted cuboids - Problems on diagonal cuts.

3.2 Venn diagrams

Representing the given data in the form of a Venn diagram –Problems on
Venn diagrams with two sets - Problems on Venn diagrams with three sets –
Problems on Venn diagrams with four sets

3.3 Binary Logic

Definition of a truth-teller - Definition of a liar - Definition of an alternator – Solving problems using method of assumptions - Solving analytical puzzles using binary logic.

Competency 4:

4.1 Number and letter series

Difference series - Product series - Squares series - Cubes series - Alternate series - Combination series - Miscellaneous series - Place values of letters.

4.2 Number and Letter Analogies

Definition of Analogy -Problems on number analogy -Problems on letter analogy - Problems on verbal analogy.

Odd man out

Problems on number Odd man out -Problems on letter Odd man out – Problems on verbal Odd man out.

Competency 5:

5.1 Coding and decoding

Coding using same set of letters - Coding using different set of letters – Coding into a number - Problems on R-model.

5.2 Direction sense

Solving problems by drawing the paths-Finding the net distance travelled – Finding the direction - Problems on clocks - Problems on shadows - Problems on damaged compass - Problems on direction sense using symbols and notations.

5.3 Critical Reasoning

Problems on assumption - Problems on conclusions –Problems on inferences – Problems on strengthening and weakening of arguments - Problems on principle -Problems on paradox

5.4 Lateral reasoning puzzle

Problems on common balance -Problems on digital balance -Problems on coins -Problems on lockers -Problems on heights -Digit puzzles using basic arithmetic operations.

Text Books:

1. GL Barrons,TataMcGraw Hills, 'Thorpe's Verbal reasoning', LSAT Materials.2015.
2. R S Agarwal, 'A Modern approach to Logical reasoning' , S chand Company Ltd 2002.

Reference Books:

1. AbhjitGuha 'Quantitative Aptitude' Tata McGraw Hills, 4th Edition, 2011.
2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd 2008.
3. G.L BARRONS 'Quantitative Aptitude'. Tata McGraw Hills,2014

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS11 INTELLECTUAL PROPERTY RIGHTS
(Common for all Branches)
(Audit Course -I)

L	T	P	C
-	-	-	-

Objectives:

The course should enable the students to:

1. Explore the knowledge in determination of trade secrets status.
2. Adequate knowledge in New Developments in trade law.
3. Understand the complexities involved in the process of attributing intellectual property rights
4. Learn the legalities of intellectual property to avoid plagiarism and other IPR relates crimes like copyright, infringements, etc.
5. Learn the fundamental principles and the application of those principles to factual, real-world disputes.

UNIT-I INTRODUCTION TO INTELLECTUAL PROPERTY

Introduction, types of intellectual property, international organizations, agencies and treaties, importance of intellectual property rights.

UNIT-II TRADE MARKS

Purpose and function of trademarks, acquisition of trademarks rights, protectable matter, selecting and evaluating trademark, trademark registration processes.

UNIT-III LAW OF COPYRIGHTS AND LAW OF PATENTS

Fundamentals of copyrights law, originality of material, rights to reproduction, rights to perform the work publicly, copyright ownership issues. Copyright registration, notice of copyright, international copyright law, foundation of patent law, patent searching process, ownership rights and transfer.

UNIT-IV TRADE SECRETS AND UNFAIR COMPETITION:

Trade secrets law, determination of trade secrets status, liability for misappropriations of trade secrets, protection for submission, trade secrets litigation, misappropriation of right of publicity and false advertising.

UNIT-V NEW DEVELOPMENTS OF INTELLECTUAL PROPERTY

New developments in trade law, copyright law, patent law, intellectual property audits international overview of intellectual property, international-trademark law, copyright law, international patent law, international development in trade secrets law.

Text Books:

1. Deborah. E. Bouchoux, "Intellectual Property Right", Cengage Learning, 4th Edition, 2013.
2. PrabuddhaGanguli, "Intellectual Property Right: Unleashing the Knowledge Economy",Tata McGraw Hill Publishing Company Ltd., 3rd Edition, 2005.

Reference Books:

1. Catherine J. Holland, "Intellectual Property: Patents, Trademarks, Copyrights, Trade Secrets", Entrepreneur Press, CDR Edition, 2007.
2. Stephen Elias, "Patent, Copyright & Trademark: A Desk Reference to Intellectual Property Law", LisaGoldoftas Publishers, Nolo Press, 1996.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS12 CLINICAL PSYCHOLOGY
(Common for all Branches)
(Audit Course -I)

L	T	P	C
-	-	-	-

Objectives:

The course should enable the students to:

1. Develop the knowledge pertinent to the organism, developmental, social and situational factors those are relevant to the initiation and maintenance of human behavior.
2. Understand the present and implement effective strategies to deal with these issues during work with patients.
3. Study the professional identity and practice as clinical psychologists through fundamental knowledge of psychology, commitment to professional ethics.
4. Understand the multiculturalism, diversity and participation in life-long learning.

UNIT- I BASIC PSYCHOLOGY

Introduction: Psychology, definition, psychology as a science, early schools of psychology, modern perspectives, methods of psychology, experimental method, systematic observation, case study method, survey method, fields of psychology.

UNIT-II BIOLOGY OF BEHAVIOR AND SENSORY PROCESS

Neurons and synapses: Nervous system , peripheral and central nervous system: brain and sleep: importance of fore brain, association cortex, left and right hemisphere functions; Some general properties of senses, subliminal stimuli, the visual sense, auditory sense, the other senses; Consciousness, meaning, functions, divided consciousness, stages of sleep, dreams, meditation, hypnosis.

UNIT- III ATTENTION AND PERCEPTION

Selective attention; physiological correlates of attention, internal influences on perception, learning set, motivation and emotion, cognitive styles. External influences on perception, figure ground, movement, illusions, perceptual organization, constancy, depth perception, binocular and monocular cues.

UNIT-IV MOTIVATION AND EMOTION MOTIVES

Definitions, motivation cycle, theories of motivation, biological motivation, social motives, frustration and conflicts of motives, defense mechanism, emotion, expression and judgment of emotion, the physiology of emotion, theories of emotion.

UNIT-V CLINICAL PSYCHOLOGY & MENTAL HEALTH

History of clinical psychology and its role in understanding and alleviation of mental illness, promotion of mental health and rehabilitation of the mentally ill, role and functions of clinical psychologists in DMHP, professional code of conduct and ethical issues.

UNIT-V CLINICAL PSYCHOLOGY & MENTAL HEALTH

History of clinical psychology and its role in understanding and alleviation of mental illness, promotion of mental health and rehabilitation of the mentally ill, role and functions of clinical psychologists in DMHP, professional code of conduct and ethical issues.

Text Books:

1. M. S. Bhatia, "Clinical Psychology", B J Publishers,1st Edition, 2008.
2. Paul Bennett, "Abnormal and Clinical Psychology: An Introductory Textbook", Pearson Publishers,2nd Edition, 2006.

Reference Books:

1. Robert A. Baron, GirishwarMisra, "Psychology: Indian Subcontinent Edition", Pearson Education, 5th Edition, 2009.
2. HillGard, E. R., C.A. Richard, L.A.Rita, "Introduction to Psychology", Oxford and IBH, New Delhi, 6th Edition, 1976

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech II Semester ECE

Code: 17AHS13 GERMAN LANGUAGE
(Common for all Branches)
(Audit Course -I)

L	T	P	C
-	-	-	-

Objectives:

The course should enable the students to:

1. Complete reading, writing, speaking, and listening assignments with ever increasing proficiency and accuracy.
2. Increase grammatical accuracy on written assignments.
3. Implement the language skills in listening, speaking, reading and writing in German language.

UNIT-I GERMAN SOUNDS

Vowels, consonants, diphthongs, umlaut, the nouns, gender distinctions, cases, definite and indefinite articles, conjugation of verbs, verbs with separable and inseparable prefixes, modal verbs, personal pronouns, possessive pronouns, reflexive pronouns, cases nominative, accusative and dative; Structure of sentence and categories of sentences, subordinate clause, causative and conditional sentences; A very interesting slideshow presentation is held to enlighten the students about the culture, people, and lifestyle in Germany.

UNIT-II SENTENCES FORMATION

Infinite sentences, use of conjunctive and conjunctive ii (contd.) plusquam perfect, modal verb (contd.) Conjunction, temporal, subordinate clauses complex sentences.

UNIT-III GERMAN BASIC GRAMMAR

Verbs: Different forms, past tense and present perfect tense, adjectives and their declension, degrees of comparison; Prepositions, genitive case, conjunctive.

Different conjunctions (co-ordinating and subordinating), simple, complex and compound sentences, active and passive voice, relative pronouns.

UNIT-IV PURPOSE OF LANGUAGE STUDY

Pictures and perceptions, conflicts and solutions, change and the future, the purpose of the study of the German language, listening, understanding, reacting, speaking, communicating, use of language, pronunciation and intonation ,reading, reading and understanding, writing, text writing, text forming, use of language, language reflection, building up the language, language comparison, culture reflection, other cultures and cultural identity.

UNIT-V GERMAN ADVANCED COMMUNICATION LEVEL-1

The significance of language study 1. Speaking and thinking 2. Self – discovery 3. Communication 4.Language Competence 5.Language and culture 6. Language changes 7. Connection with other areas of study 8.The mother—language 9.Other languages.

Text Books:

1. Korbinian, Lorenz NiederDeutschalsFremdsprache IA. Ausländer, "German Language", Perfect Paperback Publishers, 1st Edition, 1992.
2. DeutschalsFremdsprache, IB, Erganzungskurs, "German Language", Front Cover. Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.

Reference Books:

1. Griesbach, "ModernerGebrauch der deutschenSprache", Schulz Publishers, 10th Edition, 2011.
2. Anna Quick , Hermann Glaser U.A, "Intermediate German: A Grammar and workbook", Paperback, 1st Edition, 2006.

SRI VENKATESWARA COLLEGE OF ENGINEERING & TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AHS14 SPECIAL FUNCTIONS AND COMPLEX ANALYSIS
(Common to EEE and ECE)

L	T	P	C
3	1	-	3

Objectives:

The objective of this course is to make students to

1. Learn the techniques which are used in approximation theory.
2. Solve wave equation and Laplace equation with cylindrical symmetry in terms of Bessel function with spherical symmetry by Legendre's polynomial
3. Understand the concepts of complex functions and residue theorems.

Outcomes:

After completion of this course the student will be able to

1. Evaluate the integrals in terms of beta and gamma functions that cannot be expressed in terms of elementary functions. .
2. Construct analytic functions by using C-R equations, Milne Thomson method
3. Evaluate the line integrals using Cauchy's integral formula.
4. Expand the complex valued functions as Taylor's, Laurent series.
5. Determine the number of zeros or poles of a function in a given region which is useful in the stability criteria of linear systems.

UNIT-I SPECIAL FUNCTIONS:

Gamma and Beta Functions-their properties-Evaluation of Improper Integrals - Bessel and Legendre's functions-properties - Rodrigue formula - Recurrence relation - Orthogonality.

UNIT-II FUNCTIONS OF COMPLEX VARIABLE:

Continuity-Differentiability - Analyticity - properties - Cauchy Riemann equations in Cartesian and polar coordinates-Harmonic conjugate harmonic functions-Milne Thompson method. Elementary Functions & their properties - e^z , sinz ,Cosz, logz, Coshz and Sinhz.

UNIT-III COMPLEX INTEGRATION:

Line integral- - Cauchy's integral theorem - Cauchy's integral formula –Generalized Cauchy's integral formula Complex Power Series - Expansion in Taylor's series Maclaurin's series and Laurent's series.

UNIT-IV RESIUDUE CALCULUS:

Singular point- isolated singular point-pole of order m, Essential singularity. Residues - Residue theorem-Evaluation of integrals of the type

(a) improper real integrals $\int f(x)dx \; in \; [-\infty, \infty]$

(b) $\int f(cos\theta, sin\theta)d\theta \; in \; [c, c + 2\pi]$

(c) $\int e^{imx} \, f(x)dx \; in \; [-\infty, \infty]$

UNIT-V ARGUMENT PRINCIPLE AND CONFORMAL MAPPING:

Argument Principle – Rouche's theorem –Determination of number of zeros of complex polynomials- maximum Modulus principle-Fundamental theorem of algebra, Liouville's theorem. Conformal Mapping - Conformal mapping of functions e^z, lnz, z^2, sinz, cosz. - Translation-rotation-magnification and inversion- Bilinear transformation - Determination of bilinear transformation for three given points.

Text Books:

1. Grewal B.S, Higher Engineering Mathematics, Khanna publication, New Delhi, 43rd Edition, 2015.
2. Ramana .B.V., A Text Book of Engineering Mathematics, New Delhi, Tata Mc Graw Hill, 2007.
3. Iyengar T.K.V, Krishna Gandhi .B and others, A Text Book of Engineering mathematics, Vol-III, New Delhi, S. Chand & company, 2012.

References:

1. Churchile and Brown, Complex Variables and its Applications, Mc Grawhill Publications, 9th Edition, 2014.
2. Sankaraiah. C, A Text Book of Engineering Mathematics, Vijayawada, V.G.S Book Links, 2010.
3. Rukmangadachari.E., Kesava reddy.E. A Text Book of Engineering Mathematics –III, Pearson Education, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17ACS06 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

L	T	P	C
3	-	-	3

Objectives:

The objectives of this course are as follows:

1. To provide students an in-depth theoretical base of the object oriented programming using JAVA.
2. To introduce the students to the programming statements of Java to manage execution flow control.
3. To provide knowledge about the benefits of object oriented programming over Procedure oriented programming.
4. To inculcate knowledge to students to use various concepts like Inheritance, file access techniques, polymorphism and memory management techniques.

Outcomes:

Successful completion of this course, students should be able to:

1. Understand the concept and underlying principles of Object-Oriented Programming.
2. Understand how object-oriented concepts are incorporated into the Java programming language
3. Develop problem-solving and programming skills using OOP concept.
4. Develop the ability to solve real-world problems through software development in high-level programming language like Java

UNIT I OBJECT ORIENTED CONCEPTS:

OOP principles- Class fundamentals, declaring objects, introducing methods, usage of static with data and methods. JAVA BASICS: Java buzzwords, JVM architecture, data types, variables, scope and life time of variables, arrays, operators, control statements, type conversion and casting, simple java program, constructors, string and String Buffer handling functions.

UNIT II INHERITANCE AND POLYMORPHISM:

Basic concepts, types of inheritance, member access rules, usage of this and super key word, method overloading, method overriding, abstract classes, dynamic method dispatch, usage of final keyword, Garbage Collection**.**

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

UNIT III EXCEPTION HANDLING:

Exception handling fundamentals, exception types, uncaught exceptions, usage of try, catch, throw, throws and finally keywords, built-in exceptions, creating own exception sub classes**.** **MULTI THREADING**: Concepts of thread, thread life cycle, creating threads, synchronization, thread priorities, inter thread communication**. COLLECTIONS:** set, list, Queue

UNIT IV APPLETS:

Life cycle of an applet, inheritance hierarchy for applets, differences between applets and applications, developing applets, simple applet display methods, passing parameters to applets . EVENT HANDLING: Events, event sources, event listeners, relationship between event sources and listeners, delegation event model, handling mouse and keyboard events, adapter classes.

UNIT V AWT CONTROLS:

The AWT class hierarchy, user interface components- labels, button, text components, check box, check box groups, choices, list box, panels - scroll pane, menu, scrollbars. Working with frame windows, color, font **SWINGS**: Introduction to swings. Containers, top level containers - JFrame, JWindow, JDialog- JPanel, swing components - JButton, JToggleButton, JCheckBox, JRadioButton, JLabel, JTextField, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPane. **NETWORKING :** Remote Method Invocation(RMI),Client server communications

Text Book:

1. Herbert schildt, “The complete reference JAVA”, 7th edition, Tata Mcgraw Hill, New Delhi, 2010.

Reference Books:

1. T. Budd, “An Introduction to Object Oriented Programming”, 3rd edition, Pearson Education,India, 2009.
2. J. Nino, F. A. Hosch, An Introduction to programming and OO design using Java, John Wiley & sons, New Jersey,2002.
3. Y. Daniel Liang, Introduction to Java programming, 7th edition, Pearson education, India, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AMB01 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to All Branches)

L	T	P	C
3	-	-	3

Objectives:

1. Comprehend the fundamental concepts and theoretical principles of the Economics
2. The course equips the students to develop an economic way of thinking in dealing with practical business problems and challenges
3. Identify the basic economic events most common in business operations
4. Also enable the students by providing the basic knowledge of book keeping, accounting and make analysis of financial statements of a business organization.

Outcomes:

After the completion of the course student will be able to

1. Gain knowledge on managerial economics
2. Develop an understanding of economic principles and to enhance skills in high-level problem solving and critical thinking
3. Evaluate the economic environment and the impact of governmental economic policies on consumers and financial institutions.
4. Know the application of financial accounting in the field of Engineering.

UNIT –I INTRODUCTION TO MANAGERIAL ECONOMICS

Managerial Economics: Definition, Nature and Scope –Demand analysis: Law of demand, Demand determinants, Elasticity of Demand: Definition, Types, Measurement and Significance –Demand forecasting methods (Survey methods, Statistical methods, Expert opinion method, Test marketing, Controlled experiments, Judgmental approach)

UNIT –II THEORY OF PRODUCTION AND COST ANALYSIS

Production function –Cobb Douglas Production function –Laws of Returns–Internal and External economies of scale COST ANALYSIS: Cost concepts, Fixed vs. Variable costs, Explicit vs. Implicit Costs, Out of Pocket costs Vs Imputed costs, Opportunity Cost and Sunk costs BREAK EVEN ANALYSIS: Concept of Break Even Point (BEP)–Break Even Chart – Assumptions underlying and Practical significance of BEP (Simple Problems).

UNIT –III INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:

Market structures –Types of Competition –Features of perfect competition, Monopoly, Monopolistic competition –Price-Output Determination under perfect competition and Monopoly –Types of Business organization –Features, Merits and demerits of Sole proprietorship, Partnership and Joint stock companies –Types of companies –Public enterprises –Types and Features –Changing business environment in post –Liberalization scenario

UNIT –IV CAPITAL AND CAPITAL BUDGETING:

Capital and its Significance –Types of capital –Estimation of fixed and working capital requirements –Methods and sources of raising capital –Capital Budgeting Methods: Payback Method, Accounting Rate of Return (ARR), and Net Present Value (NPV) Method (Simple Problems).

UNIT –V FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS THROUGH RATIOS:

Double entry book keeping –Journal –Ledger –Trial Balance –Trading Account and balance sheet with simple adjustments Ratio analysis: Computation of Liquidity Ratios (Current and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debt-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS).

Text Books:

1. Aryasri A. R., Managerial Economics and Financial Analysis, 4/E, TMH, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand & Sons, 19/E, 2009.
3. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis, New Age international, 2009.

Reference Books:

1. Gupta R.L., Financial Accounting, Volume I, Sultan Chand & Sons, New Delhi, 2001
2. James C. Van Horne, Financial Management policy, 12/E, PHI, 2001.
3. Joel Dean, Managerial Economics, PHI, 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AEC02	**ELECTRONIC CIRCUIT ANALYSIS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

To familiarize the student:

1. With the analysis of amplifiers at low and high frequencies.
2. With the analysis and design of multistage amplifiers.
3. With the analysis of Feedback amplifiers, Oscillators, Large-Signal Amplifiers and Tuned Amplifiers.
4. With the analysis and design of various components of the power supply unit.

Outcomes:

After the completion of the course, the student will be able to:

1. Perform analysis of amplifiers at low and high frequencies.
2. Perform analysis and design multistage amplifiers.
3. Perform analysis various Feedback amplifiers and Oscillators.
4. Perform analysis various Large-Signal Amplifiers and Tuned Amplifiers.
5. Analyze and design various components of the power supply unit.

UNIT I RECTIFIERS, FILTERS AND REGULATORS:

A Half-Wave Rectifier, Ripple Factor, A Full-Wave Rectifier, A Bridge Rectifier, The Rectifier Voltmeter, The Harmonic Components in Rectifier Circuits, Inductor Filter, Capacitor Filter, Approximate Analysis of Capacitor Filters, L-Section Filter, Multiple L-Section Filter, Π-Section Filter, Π-Section Filter with a Resistor Replacing the Inductor, Summary of Filters, Voltage Regulation using Zener Diode, Series Voltage Regulation, Overload Protection, Shunt Voltage Regulators

UNIT II TRANSISTOR AT LOW FREQUENCIES:

Graphical Analysis of the CE Configuration, Two-port Devices and the Hybrid Model, Transistor Hybrid Model, The *h* Parameters, Analysis of a Transistor Amplifier Circuit using *h* parameters, The Emitter Follower, Comparison of Transistor Amplifier Configurations, Linear Analysis of a Transistor Circuit, Miller's Theorem and its Dual, Cascading Transistor Amplifiers, Simplified Common-emitter Hybrid Model, The Common-emitter Amplifier with

an Emitter Resistance, High-input-resistance Transistor Circuits, The FET Small-signal Model, The Low-frequency Common Source and Common Drain Amplifiers.

UNIT III TRANSISTOR AT HIGH FREQUENCIES AND MULTISTAGE AMPLIFIERS:

The Hybrid-pi Common-emitter Transistor Mode, Hybrid-pi Conductances and Capacitances, Validity of Hybrid-pi Mode, Variation of Hybrid-pi Parameters, The CE Short-circuit Current Gain, Current Gain with Resistive Load, The Common-source Amplifier at High Frequencies, The Common-drain Amplifier at High Frequencies, Classification of Amplifiers, Distortion in Amplifiers, Frequency Response of an Amplifier, Step Response of an Amplifier, Band-pass of Cascaded Stages, The RC-coupled Amplifier, Low-frequency Response of an RC-coupled Stage, Effect of an Emitter Bypass Capacitor on Low-frequency Response, High-frequency Response of Two Cascaded CE Transistor Stages, Multistage CE Amplifier Cascade at High Frequencies.2

UNIT IV FEEDBACK AMPLIFIERS AND OSCILLATORS:

Classification of Amplifiers, The Feedback Concept, The Transfer Gain with Feedback, General Characteristics of Negative-feedback Amplifiers, Input Resistance, Output Resistance, Bandwidth of Voltage Series, Voltage Shunt, Current Series and Current Shunt Feedback Configurations, Classification of Oscillators, Condition for Oscillations, The R-C Phase-shift Oscillator, The Wien Bridge Oscillator, Generalized Analysis of LC Oscillators-Hartley and Colpitts Oscillators and Crystal Oscillators, Frequency Stability of Oscillators.

UNIT V LARGE SIGNAL AMPLIFIERS AND TUNED AMPLIFIERS:

Classification, Class A Large-signal Amplifiers, Transformer Coupled Class A Audio Power amplifier, Efficiency of Class A amplifier, Class B amplifier, Efficiency of Class B Amplifier, Class B Push-pull Amplifier, Distortion in Power Amplifiers, Complementary Symmetry Class B Push Pull Amplifier, Class AB Amplifier, Class C Power Amplifier, Tuned Amplifiers, Q-Factor, Small Signal Tuned Amplifiers, Capacitance-Coupled Single-Tuned Amplifier, Double-Tuned Amplifier

Text Books:

1. Integrated Electronics-Analog and Digital Circuits and Systems by Jacob Millman and Christos Halkias and Chetan D Parikh, Second Edition, Tata McGraw-Hill, Fifth reprint 2011.
2. Electronic Devices and Circuits by Jacob Millman and Christos C Halkias and Satyabrata Jit, Fourth Edition, McGraw Hill Education (India) Private Limited, Second reprint 2016.
3. Electronic Devices and Circuits by S.Salivahanan, N. Suresh Kumar, Fourth Edition, McGraw Hill Education (India) Private Limited, 2017.

Reference Books:

1. Electronic Devices and Circuits Theory by Robert L. Boylestad and Louis Nashelsky, PHI, 9th Edition, 2008.
2. Micro Electronic Circuits by Adel S. Sedra and Kenneth C. Smith, Oxford University Press, 5th Edition, 2004.
3. Electronic Circuit Analysis-Rashid, Cengage learning, 2013.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AEC03	**SIGNALS AND SYSTEMS**	**L**	**T**	**P**	**C**
	(Common to ECE & EEE)	**3**	**1**	**-**	**3**

Objectives

1. To introduce theory to qualify and quantify signals and systems.
2. To do analysis of signals & systems using time domain & frequency domain methods.
3. To understand the concept of ROC in Laplace and Z-transforms.
4. To know various transform techniques in the analysis of signals and systems.

Outcomes

1. For continuous time signals the students will make use of Fourier series and Fourier transform.
2. For continuous time signals, the students will have the knowledge to make use of Laplace transforms.
3. For discrete time signals, the students will have the knowledge to make use of Z transforms.
4. The students will have the knowledge on the concepts of convolution that is useful for analysis in the areas of linear systems and communication theory.

UNIT I SIGNALS AND SYSTEMS:

Definition and classification of signals and systems, Elementary signals such as Impulse, step, ramp, sinusoidal and exponential signals, Operations on signals. Basic System Properties (Continuous-Time and Discrete-Time), Causal LTI Systems Described by Differential and Difference Equations.

Signal Analysis:

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.

UNIT II FOURIER SERIES AND FOURIER TRANSFORM:

The Response of LTI Systems to Complex Exponentials. Fourier series Representation of Continuous-Time Periodic Signals, Convergence of the Fourier series, Properties of Continuous-Time Fourier Series. The Continuous-Time Fourier Transform – properties.

Discrete-Time Fourier Transform – Properties, Basic Fourier Transform Pairs, Introduction to Hilbert Transform.

UNIT III 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 IV TIME & FREQUENCY CHARACTERIZATION OF SIGNALS AND SYSTEMS:

The Magnitude-Phase Representation of the Fourier Transform, The Magnitude-Phase Representation of the Frequency Response of LTI Systems, Distortion less transmission through a system, signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

Sampling:

Representation of a Continuous-Time Signal by its Samples - Sampling Theorem, Reconstruction of a Signal from its Samples Using Interpolation, Effect of under sampling: Aliasing.

UNIT V LAPLACE AND Z -TRANSFORM:

The Laplace Transform -The Region of Convergence - Properties, The Inverse Laplace Transform, Laplace Transform Pairs, Analysis and Characterization of LTI Systems Using the Laplace Transform, Unilateral Laplace Transform. The Z-Transform -Region of Convergence - Properties, The Inverse z-Transform, Common z-Transform Pairs, Analysis and Characterization of LTI Systems Using z-Transforms, Unilateral z-Transform.

Text Books:

1. Alan V. Oppenheim, Alan S. Willsky, & S. Hamid, "Signals and Systems," Pearson Higher Education, 2nd Ed., 1997.
2. B.P. Lathi, "Principles of LINEAR SYSTEMS and SIGNALS," Oxford Univ. Press, Second Edition International version, 2009.

Reference Books:

1. A. Anandkumar, “Signals and Systems”, PHI, 2nd Edition, 2014.
2. Simon Haykin and B. Van Veen, “Signals & Systems,” John Wiley, 2nd Edition, 2003.
3. Michel J. Robert, “Fundamentals of Signals and Systems,” MGH International Edition,2008.
4. C. L. Philips, J. M. Parr and Eve A. Riskin, “Signals, Systems and Transforms,” Pearson education, 4th Edition, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AEC04 SWITCHING THEORY AND LOGIC DESIGN

(Common to ECE and EEE)	L	T	P	C
	3	1	-	3

Objectives:

To familiarize the student:

1. To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations.
2. To introduce basic postulates of Boolean algebra and show the correlation between Boolean expressions.
3. To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits.
4. To illustrate the concept of synchronous and asynchronous sequential circuits.

Outcomes:

After completion of the course, the student will be able to:

1. Design and Analyze combinational and sequential circuits for various practical problems using basic gates and flip flops.
2. Implement LSI and MSI circuits using programmable logic devices (PLDs).
3. Demonstrate knowledge of hazards and race conditions generated within asynchronous circuits.
4. Implement synchronous state machines using flip-flops.

UNIT I NUMBER SYSTEM & BOOLEAN ALGEBRA

Digital systems, Binary Numbers, Number base conversions, Complements of numbers, Signed Binary numbers, Binary codes. Boolean algebra - Basic definition, Basic theorems and properties, Boolean Functions, Canonical & Standard forms, other logic operations & Digital logic gates.

UNIT II GATE LEVEL MINIMIZATION

The map method, four variable K-map, five variable K-map, POS & SOP Simplification, Don’t care conditions, NAND & NOR Implementation, Other two-level Implementations,

Exclusive-OR Function, Tabular Method-Simplification of Boolean function using tabulation Method.

UNIT III ANALYSIS AND SYNTHESIS OF COMBINATIONAL CIRCUITS

Combinational circuits, Analysis & Design procedure, Binary Adder-Subtractor, Decimal Adder, Binary Multiplier, Magnitude comparator, Decoder, Encoders, Multiplexers, De-multiplexers, Code Converters.

UNIT IV ANALYSIS AND SYNTHESIS OF SEQUNTIAL CIRCUITS

Sequential Circuits, Latches, Flips-Flops, Analysis of Clocked sequential circuits, State Reduction & Assignment, Design procedure, Registers & Counters – Registers, Shift Registers, Ripple Counters, Synchronous counters, other counters.

UNIT V ASYNCHRONOUS SEQUENTIAL LOGIC & PROGRAMMABLE MEMORIES

Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and flow tables, Race-free State Assignment, Hazards, Error detection and correction, ROM, PLA, PAL.

Text Books:

1. M. Morris Mano & Michel D. Ciletti, "Digital Design", Pearson, 5th Edition 2011
2. Zvi Kohavi and Nirah K. Jha, "Switching theory and Finite Automata Theory", Cambridge, 3rd Edition 2010

Reference Books:

1. Subratha Goshal, "Digital Electronics", 2012, Cengage Learning
2. Comer, "Digital & State Machine Design", Third Indian edition, OXFORD

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AEE11	**ELECTRICAL TECHNOLOGY LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

1. To understand the nature of different types of network theorems and two-port networks.
2. To understand the magnetic characteristics and Speed control of DC machines and obtain experimentally.
3. To understand about phasor concepts of Locus diagrams and Resonance in R-L-C circuits.
4. To test the different types of DC machines and determine their efficiency from test results

Outcomes:

After completion of this course the student will be able to:

1. Understand the application of Network Theorems and analysis of electrical circuits.
2. Know about the phenomenon of resonance in RLC circuits and Two-Port network.
3. Acquire knowledge about performance characteristics of Transformer, Induction Motor and Alternator.
4. Understand the methods of speed control and testing of DC Machines.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Verification of Superposition and Reciprocity theorems.
2. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
3. Experimental determination of The venin's and Norton's equivalent circuits
4. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
5. Swinburne's Test on DC shunt machine and Predetermination of efficiency as motor and generator.
6. Brake test on DC shunt motor. Determination of performance characteristics.

7. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
8. Series & Parallel Resonance in RLC Network. Determination of Timing and Resonant frequency, Bandwidth and Q Factor of circuit
9. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
10. Two port network parameters – z-y and ABCD Parameters and analytical verification. Brake test on 3-phase Induction motor (performance characteristics).
11. Regulation of alternator by synchronous impedance method.
12. Speed control of DC motor by Armature Voltage Control and Field Control Method.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AHS17 TECHNICAL WRITING AND CONTENT DEVELOPMENT

(Common to EEE, ECE, CSE & IT)	**L**	**T**	**P**	**C**
	-	**-**	**2**	**1**

Objectives:

1. To inculcate the confidence of using correct sentence in writing and speaking.
2. To enable the students to improve the proficiency in English (based on the previous learning) at all levels.
3. To train the students to use English effectively in participating impromptu speech & in public speaking.
4. To enhance the confidence in problem solving while facing the career.

Outcomes:

1. The students will use English fluently in communication by following LSRW.
2. The students will develop the art of oral presentation to develop leadership qualities.
3. The students will assimilate the importance of English in the modern world to compete with the career in the challenging world.
4. The students will strengthen the required skills to be employable.

UNIT – I NOTE MAKING & NOTE TAKING:

Importance of Note Making and Note Taking- Techniques of note making and note taking, practice in Note Writing.

UNIT – II CONTENT DEVELOPMENT & PRESENTATIONS:

Impromptu speech development on a given topic, public speaking, Expansion of proverbs and sayings- Importance of presentations- developing and organizing the presentations- Verbal and visual support in presentations-Style- using body language –effective presentation.

UNIT – III INTERVIEWS:

Types of interview-Pre interview planning-Projecting a positive image-Frequently asked questions

UNIT – IV REPORT WRITING:

Business and Technical Reports- Technical Report writing-project, industrial, Types of Reports- formats of reports- E-mail drafting.

UNIT – V INFORMATION TRANSFER:

Importance – Data Interpretation - Text to data & Data to text.

MINIMUM REQUIREMENT FOR TWCD LAB:

1) Computer aided language lab for 70 students, 70 systems – one master console software for self-study.
2) T.V, digital stereo – audio – visual system.
3) Computer laboratory with LAN Connectivity of minimum 70 multimedia systems with the following configuration.

a) Intel Pentium® D 3.00GHZ

b) RAM-1GB minimum

c) Hard disk – 160GB

d) Headphones of durable quality.

Prescribed Software – Globarena

Suggested Software:

1 K-Van Advanced Communication Skills.

2 Lingua TOEFL CBT Insider, by Dreamtech.

3 Cambridge Advanced Learners' English Dictionary with CD.

4 Oxford Advanced Learner's Compass, 8th Edition.

Reference Books:

1 Meenakshi Raman – Technical Communication,2/e, Oxford University Press, New Delhi.

2 K.R. Lakshminarayanan- Advanced English Communication, SCITECH Publications (india) Pvt. Ltd. May-2010.

3 M. Ashraf Rizvi, Effective Technical Communication- MC Graw Hill Publications-2014.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AEC07 ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to ECE & EEE)

L	T	P	C
-	-	3	1.5

Objectives:

1. To understand the working of diode, transistors.
2. To understand the working of special purpose electronics devices.
3. To understand the working of a rectifier circuit with and without filters.
4. To understand the bandwidth calculations of an amplifier circuit.

Outcomes:

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

1. Analyze CE, CB and CS amplifiers and its bandwidth calculation.
2. Calculate various parameters from the characteristics of various electronic devices.
3. Know the importance of Filters and its calculations.
4. Calculate the bandwidth of the BJT and FET in different configurations.

Electronic Workshop Practice:

1. Identification, Specifications, Testing of R, L, C Components (Color Codes), Potentiometers, Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of active devices, Diodes, BJTs, JFETs, LEDs, LCDs, SCR, UJT.
3. Soldering Practice- Simple circuits using active and passive components.
4. Study and operation of Ammeters, Voltmeters, Transformers, Analog and Digital MultiMate, Function Generator, Regulated Power Supply and CRO.

List of Experiments

Minimum of Ten Experiments need to be conducted

1. Study of CRO Operation and its Applications.
2. P-N Junction Diode Characteristics
3. Zener Diode Characteristics
   i) V-I Characteristics
   ii) Zener Diode act as a Voltage Regulator

4. Rectifiers (without and with filter)
   i) Half-wave Rectifier
   ii) Full-wave Rectifier
5. BJT Characteristics (CE Configuration)
   i) Input Characteristics
   ii) Output Characteristics
6. BJT Characteristics (CB Configuration)
   i) Input Characteristics
   ii) Output Characteristics
7. FET Characteristics (CS Configuration)
   i) Drain (Output) Characteristics
   ii) Transfer Characteristics
8. SCR Characteristics.
9. UJT Characteristics.
10. LDR Characteristics.
11. LED Characteristics.
12. Transistor Biasing.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech I Semester ECE

Code: 17AHS18 ENGLISH FOR COMMUNICATION – II

(Common to EEE, ECE, CSE & IT)	**L**	**T**	**P**	**C**
	-	-	-	-

Objectives:

1. To enable the students to communicate in English for academic and social purpose.
2. To make the students to master LSRW skills to meet the challenges in the society.
3. To strengthen the students to have command over English Language and thereby to have command over subjects.
4. To develop the skills necessary for employment.

Outcomes:

1. The students will enrich their communication skills both in academic and social area.
2. The students will master LSRW skills.
3. The students will become proficient in English language and make use of it to be good in his subject.
4. The students will gain employability skills.

UNIT – I COMMUNICATION:

Definition, difference between verbal and non-verbal, process of communication, Importance and need for communication-Types of communication-Barriers of communication.

UNIT –II WORD FORMATION:

Ways of forming words, Root Words- homonyms, homophones, homographs - words often confused Synonyms & Antonyms, - one word substitutions-common errors.

UNIT –III TELEPHONIC COMMUNICATION:

Receiving calls - leaving messages- useful phrases- asking for and giving information-fixation and cancellation of appointment - Telephonic interviews

UNIT –IV READING COMPREHENSION-

Techniques for good comprehension- Reading for specific details and Information-Skimming-Scanning- measures in Intensive Reading- extensive reading-

UNIT –V WRITTEN COMMUNICATION:

Essay Writing- Paragraph Writing- Social, Political and Economic problems.

Text Book:

1. M Ashraf Rizvi, Effective Technical Communication, Mc Graw Hill Education (India) Private limited, 2014.

Reference Books:

1. Communication SKILLS, Sanjay Kumar & Pushpalatha Oxford University y Press.2012.
2. A Course in Communication Skills- Kiranmai Dutt & co. Foundation Books, 2012.
3. Meenakshi Raman – Technical Communication,2/e, Oxford University Press, New Delhi.
4. History of English Language /F T Wood
5. English Grammar and composition David Green.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech I Semester ECE (Common to All Branches)

Code: 17AME64 EPIC-I: INTRODUCTION TO ENGINEERING PROJECTS

L	T	P	C
-	2	-	-

Objectives:

Students will be able to

1. Summarize different Engineering disciplines and identify Engineering challenges.
2. Evaluating opportunities and design process applicable to real world.
3. Mention the methods for generating ideas to improve the design of existing product.
4. Build Multi-disciplinary system perspective.
5. Design a physical model and recognizing the importance of technical report writing.

Outcomes:

At the end student will be able to

1. Define various disciplines technology and engineering challenges.
2. Judge the responsibilities as professional engineer in solving the societal problems.
3. Develop the broad set of skills needed to be successful in the changing global workplace and world.
4. Identify the new opportunities to formulate and solve engineering problems.
5. Predict the importance of oral, written and academic skills.
6. Adopt social context of engineering practice.
7. Apply engineering reasoning to problem solving.
8. Integrate working with multi-disciplinary teams and build team work skills.

UNIT – I ENGINEERING PROCESS

Brief history of engineering and technology, engineering as a profession, science Vs engineering, stages of design – from the world of imagination to world of objects.

Assignment: Report on an identified technological evolution and factors drivingtechnological evolution.

UNIT – II OPPORTUNITY IDENTIFICATION

Opportunity Identification from inspiration – an act of creative awareness, how to find inspiration, brainstorming method for identifying opportunities. Methods of evaluating opportunities.Case studies.

Assignment: Identify new potential opportunities based on the customer pain points and evaluate them to identify real opportunities.

UNIT – III CONCEPTUALIZATION

Methods for generating ideas to solve the customer pain points including brainstorming, concept maps, and SCAMPER.

Assignment: Application of idea generation methods to improve an existing product

UNIT – IV SKILL DEVELOPMENT

Sketching, Prototyping Communication. Interaction with peers, demonstration of projects developed by senior students and alumni.

UNIT – V PROJECT WORK

An open-ended design project executed from opportunity to prototype. Culminating with a presentation, model, display and report.

Text Books:

1. Karl Aspelund, "The Design Process –Fairchild books", Bloomsbury Publishing Inc.
2. ND Bhatt, "Engineering Drawing, Plane and Solid Geometry", Charotar Publishing House Pvt. Ltd., Publishers of Engineering Text Books.

REFERENCE BOOKS:

1. Paul H Wright, "Introduction to Engineering", John Wiley and Sons, Inc.
2. SaeedMoaveni, "Engineering Fundamentals: an Introduction to Engineering", Cengage Learning, printed in USA.
3. Reymond B Landis, "Studying Engineering: A Road Map to rewarding career",
4. Discovery press.

E-BOOKS:

1. Robin Mckenzie and Robin Mckenzie, "Product Design and Engineering".
2. IdrisMootee, "Design Thinking for strategic Innovation", Wiley publication.
3. Carl Liu, "Innovative product design practice".

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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II B.Tech II Semester ECE

Code: 17AEC08	**ANALOG COMMUNICATIONS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives

1. To study the fundamental concept of the analog communication systems.
2. To analyze linear CW and angle CW modulation and demodulation techniques.
3. To understand the influence of noise on the performance of analog communication systems
4. To know the working of various analog pulse modulation and demodulation techniques.

Outcomes

At the end of course, students should be able to:

1. Acquire knowledge on the basic concepts of analog communication systems.
2. Analyze the linear CW and angle CW modulated and demodulated systems.
3. Verify the effect of noise on the performance of communication systems.
4. Analyze various analog pulse modulation and demodulation techniques.

UNIT I INTRODUCTION:

Elements of communication Systems - information, Messages and Signals, Fundamental Limitations of communication Systems, Modulation, Modulation Benefits and Applications.

Amplitude Modulation & Demodulation: Baseband and carrier communication, Amplitude Modulation (AM), Modulation Index of AM, Single tone AM, Sideband and carrier power of AM, Generation of AM signal using Switching modulator, Demodulation of AM signal using Envelope detector,

UNIT II SUPPRESSED CARRIER MODULATION & DEMODULATION:

Double sideband suppressed carrier (DSB-SC) Modulation- Generation of DSB-SC signal using Switching modulator and Ring modulator, Frequency mixer, Demodulation of DSB-SC signal using Coherent detector, Single sideband (SSB) transmission- Time domain representation of SSB signals, Generation of SSB signals using Selective- Filtering method and Phase shift method, Demodulation of SSB signal using Coherent detector, Vestigial sideband (VSB) modulator & demodulator.

UNIT III ANGLE MODULATION & DEMODULATION:

Concept of instantaneous frequency, Generalized concept of angle modulation, Bandwidth of angle modulated waves – Narrow band frequency modulation (NBFM) and Wide band frequency modulation (WBFM), Phase modulation, Verification of Frequency modulation bandwidth relationship.

Generation of FM waves – Indirect method, Direct generation; Demodulation of FM, Bandpass limiter, Practical frequency demodulators, Pre-emphasis and De-emphasis filters, FM Capture Effect, Carrier Acquisition- phased locked loop (PLL), Costas loop.

UNIT IV NOISE IN COMMUNICATION SYSTEMS:

Thermal Noise & Available Power, White noise and filtered noise, Noise equivalent bandwidth, Baseband systems with channel noise, Performance analysis (i.e. finding SNR expression) of AM, DSB-SC, SSB-SC, FM, PM in the presence of noise.

UNIT V PULSE ANALOG MODULATION:

Sampling of low pass signals, Types of sampling, Pulse Amplitude Modulation (PAM) generation and detection. Pulse time modulation schemes: PWM and PPM generation and detection.

Analog Communication Systems: Transmitters and Receivers for CW Modulation – direct conversion receiver, Super Heterodyne receivers, Receiver Measurements.

Text Books:

1. B. P. Lathi, "Modern Digital and Analog Communication Systems," Oxford Univ.press, 3rd Edition, 2006.
2. Bruce Carlson. A, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.

Reference Books:

1. Simon Haykin, "Communication Systems", Wiley-India edition, 3rd edition, 2010.
2. Herbert Taub& Donald L Schilling, "Principles of Communication Systems", Tata McGraw - Hill, 3rd Edition, 2009.
3. Singh R.P. and Sapre S.D., "Communication Systems," TMH, 2007.
4. George Kennedy and Bernard Davis, "Electronics & Communication System", TMH, 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC09 PROBABILITY THEORY AND STOCHASTIC PROCESSES

L	T	P	C
3	1	-	3

Objectives

The course will provide the student

1. To understand the basic concepts of probability, conditional probability and single random variable.
2. To deal multiple random variables, joint distribution, joint density and their operations.
3. Analysis of temporal characteristics of random process and application to the signal processing in the communication system.
4. To understand Spectral characteristics of Random Processes and to derive relation between autocorrelation and power spectral density**.**
5. To learn the response of LTI systems to random signals.

Outcomes

After completion of the course, the student will be able to

1. Understand the axiomatic formulation of modern Probability Theory and think of random variables as an intrinsic need for the analysis of random phenomena.
2. Characterize probability models and function of random variables based on single & multiples random variables.
3. Understand the concept of random processes and determine autocorrelation and spectral density of stationary random processes.
4. To analyze the LTI systems with stationary random process as input.

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-properties, Conditional Probability-properties, Total Probability, Bays' Theorem, Independent Events: Two events and multiple events, properties of independent events.

The Random Variable : Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Raleigh,

Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties, Expectation, Moments, Characteristic function, Moment generating function.

UNIT II MULTIPLE RANDOM VARIABLES:

Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Joint Density Function, Properties of Joint Density, Marginal Density Functions, 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 III RANDOM PROCESSES – TEMPORAL CHARACTERISTICS:

The Random Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationary and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationary, (N-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 Functions, Gaussian Random Processes, Poisson Random Process.

UNIT IV RANDOM PROCESSES – SPECTRAL CHARACTERISTICS:

The Power density Spectrum: Properties, Relationship between Power density Spectrum and Autocorrelation Function, the Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

UNIT V LINEAR SYSTEMS WITH RANDOM INPUTS:

Random Signal Response of Linear Systems: System Response – Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, Spectral Characteristics of System Response:

Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and Output, Band pass, Band-Limited and Narrowband Processes, Properties.

Text Books:

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

Reference Books:

1. R.P. Singh and S.D. Sapre, "Communication Systems Analog& Digital", TMH, 1995.
2. Henry Stark and John W.Woods, "Probability and Random Processes with Application to Signal Processing",Pearson Education, 3rd Edition.
3. George R. Cooper, Clave D. MC Gillem, "Probability Methods of Signal and System Analysis", Oxford, 3rd Edition, 1999.
4. S.P. Eugene Xavier, "Statistical Theory of Communication", New Age Publications, 2003.
5. B.P. Lathi, "Signals, Systems & Communications", B.S. Publications, 2003.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC10	**PULSE AND DIGITAL CIRCUITS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

To familiarize the student:

1. With various wave shaping circuits and their applications.
2. With different circuits that produce non-sinusoidal waveform and their applications
3. With various voltage time base generators and their applications.
4. With different logic families and their comparison.

Outcomes:

After the completion of the course, the student:

1. Will be able to understand various linear wave shaping circuits and their applications.
2. Will be able to understand various non-linear wave shaping circuits and their applications.
3. Will be able to analyze and design various multivibrator circuits and time base generators.
4. Will be able to understand operation of various sampling gates and digital logic gates.

UNIT I LINEAR WAVESHAPING

High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. High Pass RC network as Differentiator, Low Pass RC network as integrator, attenuators and its applications as a CRO probe, RL circuit and its response for step input.

UNIT II NON-LINEAR WAVE SHAPING

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

UNIT III MULTIVIBRATORS

Transistor as a switch, Break down voltages, Transistor-Switching Times, Triggering circuits. Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger circuit using BJT.

UNIT IV 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, Transistor Current time base generators.

SYNCHRONIZATION AND FREQUENCY DIVISION

Pulse Synchronization of relaxation Devices, Frequency division in sweep circuit, Stability of relaxation Devices, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals.

UNIT V SAMPLING GATES

Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Four Diode Sampling Gate, Reduction of pedestal in gate circuits, Six Diode Gate, Application of Sampling Gates.

Digital Logic Circuits

AND, OR, NOT, NAND and NOR gates using RTL and DTL families.

Text Books:

1. J.Millman, H.Taub and Mothiki S. Prakash Rao, " Pulse, Digital and Switching Waveforms", TMH ,2nd Edition, 2008.
2. David A. Bell, "Solid State Pulse Circuits", PHI, 4th edition, 2002.

Reference Books:

1. Jacob Millman, Christos C. Halkias, "Integrated electronics" Tata McGraw Hill Publication
2. A. Anand Kumar, "Pulse and Digital Circuits", PHI, 2005.
3. Ronald J. Tocci, "Fundamentals of Pulse and Digital Circuits", 3rd edition, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AMB02	**MANAGEMENT SCIENCE**	**L**	**T**	**P**	**C**
	(Common to ECE, EEE, CSE & IT)	**3**	**-**	**-**	**3**

Objectives:

1. The course will provide the student:
2. To learn the principles of management.
3. To apply concepts in administering technology driven industrial units.
4. To gain an understanding of management functional areas like Production, HR, Marketing etc.
5. To develop knowledge using OR techniques for project management.
6. To analyze the importance of production in the organization.

Outcomes:

1. After completion of this course students will be able to:
2. Apply various areas of functional management for the prospects of business organization.
3. Apply management principles for decision making.
4. Handle intricacies of projects efficiently.
5. Use tools and techniques to become an effective manager.
6. Apply production tools and techniques in every area of business

UNIT I INTRODUCTION TO MANAGEMENT:

Nature, importance and Functions of Management, Approaches to Management - Taylor's Scientific Management - Henry Fayol's Principles of Management, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Leadership Styles – Introduction to Organization –Types of Mechanistic and organic structures.

UNIT II OPERATIONS MANAGEMENT:

Principles and Types of Plant Layout - Methods of production (Job, batch and Mass Production), Work Study - Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: $\bar{x}$ chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, TQM Concept - Deming's principles, Six sigma, Bench marking.

UNIT III MATERIALS MANAGEMENT:

Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, MRP, JIT, Marketing: Functions of Marketing, Marketing Mix, Product Life Cycle, Channels of Distribution.

UNIT IV HUMAN RESOURCES MANAGEMENT (HRM):

Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Wage and Salary Administration, Job Evaluation and Merit Rating, Performance Appraisal

UNIT V PROJECT MANAGEMENT (PERT/CPM):

Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (Simple Problems)

Text Books:

1. Aryasri, "Management Science", TMH 4/e, 2009.
2. Stoner, Freeman, Gilbert, Management, 6th Edition, Pearson Education, New Delhi, 2004.
3. PannerSelvem, "Production and Operations Management", 3/e, Prentice Hall of India, 2012.

Reference Books:

1. Kotler Philip & Keller Kevin Lane, "Marketing Management", 12/e, PHI, 2005.
2. Koontz & Weihrich, "Essentials of Management", 6/e, TMH, 2005.
3. SubbaRao. P, "Personnel and Human Resource Management", Himalaya Publishing House, 2000

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEE14	**CONTROL SYSTEMS**	**L**	**T**	**P**	**C**
	(Common to EEE & ECE)	**3**	**1**	**-**	**3**

Objectives:

1. To understand the concept of open loop and closed loop control systems and their applications, mathematical models of electrical and mechanical systems.
2. To acquire the knowledge about time response, steady state errors and generalized error coefficients.
3. To analyze the stability in time domain and frequency domain.
4. To acquire the knowledge about state space representation.

Outcomes:

After completion of the course student will be able to

1. Gain knowledge in open loop and closed loop control systems, modeling of electrical & mechanical systems and various compensators.
2. Find the transfer functions for various electrical and mechanical systems.
3. Apply the time domain and frequency domain analysis for stability.
4. Analyze systems using Transfer functions and state space models.

UNIT I INTRODUCTION:

Concepts of Control Systems - Open Loop and closed loop control systems and their differences - Feed-back Characteristics and their effects- Impulse Response and transfer functions - Transfer unction of Mechanical systems & Electrical systems - Transfer Function of Servo motors - Block diagram algebra - Signal flow graph Reduction using Mason's gain formula.

UNIT II TIME RESPONSE ANALYSIS:

Standard test signals - Time response of first order systems - Transient response of second order systems - Time domain specifications - Steady state errors and error constants - Generalized error coefficients – Introduction to PID Controllers.

UNIT III STABILITY ANALYSIS:

Concept of stability – Routh's stability criterion – Qualitative stability and conditional stability – Limitations of Routh's stability analysis - Root locus concept - Construction of

root loci-effects of adding poles and zeros to G(s)H(s) on the root loci - Relative statbility analysis.

UNIT IV FREQUENCY RESPONSE ANALYSIS:

Concept of frequency response and Frequency domain specifications - Bode diagrams - Transfer function from the Bode Diagram - Polar Plot-Phase margin and Gain margin - Stability Analysis from Bode Plot and Polar plot-Nyquist stability criterion, Compensation techniques– realization of Lag, Lead and Lag-Lead compensators.

UNIT V STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS:

Concepts of state - State variables and State Model – Eigen values and Eigen Vectors – Diagonalization – Solution of state Equation - State Transition Matrix and its properties - Concept of controllability and observability, Kalman's test only.

Text Books:

1. A. Anand kumar, Control Systems, PHI learning Pvt Ltd., 2nd edition, 2014.
2. I. J. Nagrath and M. Gopal,Control Systems Engineering, New Age International (P) Limited, 5th edition, 2007.

Reference Books:

1. K. Ogata, Modern Control Engineering, Prentice Hall of India, 4th edition, 2006.
2. B.C.Kuo and Farid Golnaraghi, Automatic Control Systems, Prentice Halls, 9th Edition, 2014.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC11 ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES

L	T	P	C
3	1	-	3

Objectives:

1. To understand the behavior of electric and magnetic fields in different media viz. conductors and insulators etc.
2. To know about the nature of wave propagation in different media.
3. To study the behavior of transmission lines and analyze transmission line problems**.**
4. To understand and analyze wave equations in various conducting and non-conducting media.

Outcomes:

The students will be able to

1. Apply EM field concepts with in the design and construction of electrical equipment.
2. Apply the wave propagation theories in the analysis and design of communication systems.
3. Design and construct Transmission Lines.
4. Understand the importance of various stub matching techniques.

UNIT I ELECTROSTATICS

Review of Vector algebra, Co-ordinate systems & transformation, Vector calculus,
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 Equations for Electrostatic Fields,Electric dipole,Energy Density,Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors.

UNIT II MAGNETOSTATICS

Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy.

UNIT III MAXWELL'S EQUATIONS

Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Differential and Integral Forms and Word Statements. Conditions at a Boundary Surface: Dielectric-Dielectric and Dielectric-Conductor Interfaces.

UNIT IV EM WAVE CHARACTERISTICS

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagtion in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization.

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Surface Impedance, Poynting Vector and Poynting Theorem – Applications.

UNIT V TRANSMISSION LINES

Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Lossless / Low Loss Characterization, Distortion – Condition for Distortion less and Minimum Attenuation, Loading - Types of Loading.

Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR, Smith Chart – Configuration and Applications.

Text Books:

1. Matthew N.O. Sadiku, "Elements of Electromagnetics," Oxford Univ. Press, 4th ed., 2008.
2. William H. Hayt Jr. and John A. Buck, "Engineering Electromagnetics," TMH, 7th ed 2006.
3. Y.Mallikarjuna Reddy, "Electromagnetic Waves and Transmission Lines" Universities Press.

Reference Books:

1. E.C. Jordan and K.G. Balmain, "Electromagnetic Waves and Radiating Systems"PHI, 2nd Ed., 2000.
2. John D. Krauss, "Electromagnetics", McGraw- Hill publications, 3rd ed., 1988.
3. John D. Ryder, "Networks, Lines, and Fields," PHI publications, Second Edition, 2012.
4. Schaum's out – lines, "Electromagnetics," Tata McGraw-Hill publications, Second Edition, 2006.

5. G. S. N. Raju, “Electromagnetic Field Theory and Transmission Lines,” Pearson Education, 2013
6. N.NarayanaRao,“Fundamentals of Electromagnetics for Engineering,”Pearson Edu. 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC14	**SIGNALS AND SYSTEMS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives

1. The course intends to provide an overview of signal analysis.
2. This course relies on elementary treatment and qualitative analysis of Fourier Transform, Laplace Transform and Z-Transforms
3. To provide an overview of signal transmission through linear systems, convolution and correlation of signals and sampling.

Outcomes

After completion of the laboratory, the students will have the knowledge and will be able to

1. Determine the mathematical representation and classification of signals and systems.
2. Determine and analyse the response of an LTI system using convolution theorem.
3. Determine and analyse the response of LTI system to arbitrary time signals using transformation methods.
4. State the sampling theorem and its applications.

List of Experiments

(Minimum Twelve experiments to be conducted)

1. Basic operations on Matrices
2. Generation of Various signals and Sequences (Periodic and Aperiodic), Such as Unit Impulse, Unit Step, Square, Saw Tooth, Triangular, Sinusoidal, Ramp, sinc function.
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 or Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and Sequences.
6. Autocorrelation 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 Realizability 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 Zeros and poles, and plotting the Pole-Zero maps in S-Plane and Z-Plane for the given Transfer Functions.
13. Generation of Gaussian Noise (Real and Complex), Computation of its Mean, M.S. Values and its Skew, Kurtosis, and PSD, Probability Distribution Function.
14. Sampling Theorem Verification.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC15	**PULSE AND DIGITAL CIRCUITS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**2**	**1**

Objectives:

To familiarize student with

1. Generation and processing of sinusoidal and non-sinusoidal signals.
2. Fundamentals of basic logic gates and its applications.
3. Analysis and design of various multivibrator circuits.
4. Design and analysis of UJT relaxation oscillator and boot-strap sweep circuits

Outcomes:

After the completion of the lab, the student

1. Will be able to Generate and process sinusoidal and non-sinusoidal signals.
2. Will be able to understand fundamentals of basic logic gates and design applications using basic gates.
3. Will be able to design and analyze various multivibrator circuits.
4. Will be able to design and analyze UJT relaxation oscillator and boot-strap sweep circuits

LIST OF EXPERMENTS

(Minimum Twelve experiments to be conducted)

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clamper's.
4. Transistor as a switch.
5. Study of Logic Gates & Some applications.
6. Half adder & Full adder.
7. Sampling Gates.
8. Astable Multivibrator.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.
14. Constant Current Sweep Generator using BJT.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AEC16	**ELECTRONIC CIRCUIT ANALYSIS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

To familiarize student with

1. Design and Simulation of various amplifier circuits.
2. Design and Simulation of various feedback amplifier and power amplifier circuits.
3. Design and testing of various amplifier circuits.
4. Design and testing of various oscillator circuits.

Outcomes:

After the completion of the lab, the student

1. Will be able to analyze, design and simulate various amplifier circuits.
2. Will be able to analyze, design and simulate various feedback amplifier and power amplifier circuits.
3. Will be able to analyze, design and test various amplifier circuits.
4. Will be able to analyze, design and test various oscillator circuits.

LIST OF EXPERMENT

(Minimum of 10 Experiments to conducted):

Design, Simulate and Testing of

1. Common Emitter Amplifier
2. Common Collector Amplifier
3. Common Source Amplifier
4. A Two Stage RC Coupled Amplifier
5. Current shunt and Voltage Series Feedback Amplifier
6. Wien Bridge Oscillator using BJT
7. RC Phase Shift Oscillator using BJT
8. Hartley Oscillator using BJT
9. Colpitts Oscillator using BJT
10. Class-A Power Amplifier (Transformer less)
11. Class-B Complementary Symmetry Amplifier
12. Class-C Power Amplifier

Note: Experiments should be implemented both in software and hardware

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AME65 EPIC-II: ENGINEERING PROJECTS IN COMMUNITY SERVICE

(Common to All Branches)

L	T	P	C
-	2	-	-

Objectives:

Students will be able to

1. Apply domain knowledge to the design of community- based projects
2. An ability to identify and acquire new knowledge as a part of the problem- solving/design process
3. Develop an ability to function on multidisciplinary teams and an appreciation for the contributions from individuals from multiple disciplines
4. Create an awareness of professional ethics and responsibility
5. Build a role that their discipline can play in social contexts

Outcomes:

At the end student will be able to

1. Apply disciplinary knowledge to real and possibly ill-defined problems.
2. Collaborate with people from other disciplines and develop an appreciation for cross-disciplinary contributions in design.
3. Develop the broad set of skills needed to be successful in the changing global workplace and world.
4. Identify the customer requirements and community demands.
5. Design the products useful for the community service.
6. Communicate effectively with widely varying backgrounds.
7. Provide significant service to the community while learning; gain an understanding of the role that engineering (and their discipline) can play in society.
8. Follow the engineering and social ethics.

UNIT – I PROJECTSURVEY AND IDENTIFICATION

Introduction to Epics,importance of multi disciplinary projects, rural area Survey (societal issues), interaction with NGOs, Idea Generation and Group Discussions. Identification of objectives and outcome deliverables of the project and need of the community partner.

UNIT – II PROJECT INITIATION AND SPECIFICATION

Market Survey (similar products), Customer Requirements, Design Constraints, Engineering Specifications of the product, Design Skill developmentSessions - Different kinds of design thinking and its challenges, overall understanding of design processes.

UNIT – III DESIGNSKILL DEVELOPMENT FOR IMPLEMENTATION

Basics of design process,Concept Design Process, problem solving and Mathematical Analysis, Concept Testing, Design fixation, Design start- to- finish process, proposed methodology, and prototype Design activity.

UNIT – IV PROJECT DESIGN FOR DEPLOYMENT

Code of ethics**,** Create Prototype, model refinement, product development, testing with Customer, Design documentation, identifying delivery phases of the design process and model demonstration.

UNIT – V PROJECT REVIEW AND DELIVERY

Effective delivery, Design review Presentations**,** Making Projects User-Ready**,** feedback from community partners, and extension of the product for consultancy work.

Textbooks:

1. How to Conduct Surveys: A Step-by-Step Guide, Fink, Arlene. 1998. Sage Publications
2. Examples of good practice in Special Needs Education& Community-Based Programs, UNESCO PRESS
3. Project Management , Gary R. Heerkens, McGraw-Hill
4. Engineering Design-A Systematic Approach,Gerhard Pahl, Wolfgang Beitz, JörgFeldhusen, Karl-Heinrich Grote ,ISBN: 978-1-84628-318-5 (Print) 978-1-84628-319-2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AHS19 **Quantitative Aptitude and Reasoning II**
(Common to all Branches)
(Audit course – II)

L	T	P	C
-	-	-	-

Objectives:

The main objectives of this course are

1. To evaluate various real life situations by resorting to analysis of key issues and factors.
2. To understand various languages structures.
3. To demonstrate different principles involved in solving mathematical problems and thereby reducing the time taken for performing job functions.
4. To explore the possibilities of utilization of concepts of reasoning.

Outcomes:

After completion of the course the student will be able to

1. Strengthen their ability to meet the challenges in solving real life problems.
2. The student will preserve maturity of the mind in solving linguistic problems.
3. Develop the thinking ability and apply Quadratic equations.
4. Apply the Analytical Reasoning puzzles to solve linear and circular arrangements

Syllabus for Quantitative Aptitude

Competency 1:

Area : Formulas for Areas - Problems on Areas, **Volumes & Surface Areas :** Problems on volumes - Problems on Surface Areas, **Races & Games of Skill , Calendars :** Definition of a Leap Year - Finding the number of Odd days - Framing the year code for centuries - Finding the day of any random calendar date , **Clocks :** Finding the angle when the time is given - Finding the time when the angle is known - Relation between Angle, Minutes and Hours - Exceptional cases in clocks , **Stocks & Shares, Permutation and Combinations:** Definition of permutation - Definition of Combinations - Problems on Combinations.

Competency 2:

Probability: Definition of Probability - Problems on coins - Problems on dice - Problems on Deck of cards - Problems on Years. **True Discount, Banker's Discount, Heights & Distances, Odd man out & Series:** Problems on number Odd man out - Problems on letter

Odd man out - Problems on verbal Odd man out. **Data Interpretation:** Problems on tabular form - Problems on Line Graphs - Problems on Bar Graphs - Problems on Pie Charts.

Syllabus for Reasoning

Competency 3:

Deductions: Finding the conclusions using Venn diagram method - Finding the conclusions using Venn diagram method - Finding the conclusions using syllogism method. **Connectives:** Definition of a simple statement - Definition of compound statement - Finding the Implications for compound statements - Finding the Negations for compound statements.

Competency 4:

Analytical Reasoning puzzles: Problems on Linear arrangement - Problems on Circular arrangement - Problems on Double line-up - Problems on Selections - Problems on Comparisons.

Competency 5:

Blood relations: Defining the various relations among the members of a family - Solving Blood Relation puzzles - Solving the problems on Blood Relations using symbols and notations.

Text Books:

1. GL Barrons, Tata Mc Graw Hills, 'Thorpe's Verbal reasoning', LSAT Materials. 2015.
2. R S Agarwal, 'Quantitative Aptitude' S. Chand Company Ltd. 2018.
3. R S Agarwal, 'A Modern approach to Logical reasoning', S chand Company Ltd. 2017.

Reference Books:

1. Abhjit Guha 'Quantitative Aptitude' Tata Mc Graw Hills, 4th Edition, 2011.
2. G.L BARRONS 'Quantitative Aptitude'. Tata Mc Graw Hills.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AHS20 LEGAL SCIENCES
(Common to EEE, ECE, CSE & IT)
(Audit Course - II)

L	T	P	C
-	-	-	-

Objectives:

The main objectives of this course are to

1. Acquaint the student with the scientific method of social science research.
2. Provide the knowledge of the technique of selection, collection and interpretation of primary and secondary data in socio legal research.
3. Emphasis would be laid on practical training in conducting research To apply the above concepts to data analysis.

Outcomes:

After completion of the course the student will be able to

1. Apply comparative public laws and human rights.
2. Use appropriate Principles of corporate law.
3. Analysis of law with scientific methods.

UNIT-I CONCEPT OF LEGAL SCIENCE:

Fundamentals of legal science- law systems in India, comparative public law-law and justice in a globalizing world-Impact of the human rights instruments on domestic law.

UNIT-II TECHNOLOGY & LEGAL SYSTEMS:

Principles of corporate law conjunction- temporal, subordinate clauses complex sentences- intellectual property rights- contract law- cyber law.

UNIT-III

CONSTITUTION AND ADMINISTRATIVE LAW:

Minorities law-human rights-international and national sphere-media law-Health law-globalization vis-à-vis human rights-significance of human rights.

UNIT-IV HUMAN RIGHTS INTERNATIONAL AND NATIONAL SPHERE:

Human rights with special reference to right to development-rights of disadvantaged and vulnerable groups-critical analysis-cultural relativism and human rights-human rights in the Indian sphere-an over view-constitution and the analysis of preamble-social action litigation and the role of Indian judiciary-critical examination of the human rights council and human rights commission-treaty mechanism with respect to covenants ICESCR and ICCPR-convention on the elimination of discrimination against women and child rights convention.

UNIT-V SCIENTIFIC METHODOLOGY IN LEGAL SYSTEMS:

The science of research and scientific methodology - analysis of law with scientific methods-scientific approach to socio legal problems, interrelation between speculation-fact and theory building fallacies of scientific methodology with reference to socio legal research-inter-disciplinary research and legal research models-arm chair research vis-a-vis empirical research-legal research-common law and civil law legal systems.

Text Books:

1. Robert Watt, "Concise book on Legal Research", Abe Books Publishers, 1st Edition, 2015.
2. Ram Ahuja, "Research Method", News Way Publishers, 1st Edition, 2012.
3. Goode, Hatt, "Research Methodology", Eastern Limited Publication, 1st Edition reprinted, 2006.

Reference Books:

1. Somekh, C. Lewin, "Research Methods", Vistaar Publications, 1st Edition, 2005.
2. Bhandarkar, "Research Methods, Research Styles and Research Strategies", Wilkinson Publishers, 1st Edition, 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AHS21 GENDER SENSITIVITY
(Common EEE, ECE, CSE & IT)
(Audit Course - II)

L	T	P	C
-	-	-	-

Objectives:

The main objectives of this course are to

1. Understand the basic concepts relating to gender and to provide logical understanding of gender roles.
2. Analyze present various perspective of body and discourse on power relationship.
3. Develop cultural construction of masculinity and femininity.

Outcomes:

After completion of the course the student will be able to

1. Apply comparative public laws and human rights.
2. Use appropriate Principles of corporate law.
3. Analysis of law with scientific methods.

UNIT-I INTRODUCTION:

Sex and gender; types of gender, gender roles and gender division of labour, gender stereotyping and gender discrimination-the other and objectification, male gaze and objectivity

UNIT-II GENDER PERSPECTIVES OF BODY:

Biological-phenomenological and socio-cultural perspectives of body, body as a site and articulation of power relations- cultural meaning of female body and women's lived experiences -gender and sexual culture.

UNIT-III SOCIAL CONSTRUCTION OF FEMININITY:

Bio-social perspective of gender, gender as attributional fact, essentialism in the construction of femininity, challenging cultural notions of femininity.

Butler, Douglas, Faucault and Haraway, images of women in sports, arts, entertainment and fashion industry, media and feminine identities.

UNIT-IV SOCIAL CONSTRUCTION OF MASCULINITY:

Definition and understanding of masculinities, sociology of masculinity, social organization of masculinity and privileged position of masculinity, politics of masculinity and power, media and masculine identities.

UNIT-V WOMEN'S STUDIES AND GENDER STUDIES:

Evolution and scope of women's studies, from women's studies to gender studies: A paradigm shift, women's studies vs. gender studies, workshop, gender sensitization through gender related.

Text Books:

1. Women's studies in India by Mary E. John : A Reader Publisher, Penguin Books.
2. Gender Studies by Sujata Sen – Pearson Educatio publisher – 2012.

Reference Books:

1. Alolajis. Mustapha, Sara Mils, "Gender Representation in Learning Materials", Pearson Publications, 1st Edition 2015.
2. Gender, "How Gender Inequality Persists in the Modern World", Oxford University Press, Reprinted Edition, 2011.
3. William M Johnson, "Recent Reference Books in Religion", Duke University Publications, Reprinted Edition, 2014.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech II Semester ECE

Code: 17AHS22 FRENCH LANGUAGE
(Common EEE, ECE, CSE & IT)
(Audit Course - II)

L	T	P	C
-	-	-	-

Objectives:

The main objectives of this course are to

1. Learn basic oral and communication skills
2. Enable the students to have higher education and job opportunities abroad.

Outcomes:

After completion of the course the student will be able to

1. Acquire language skills
2. Communicate in French which is the second most commonly used language worldwide.

UNIT-I INTRODUCTION & PRESENTATION:

Conversation, Introduction, Grammar verb "appeller", Alphabets & Accents Culture, Formal & Informal – Use of 'tu' and 'vous', Map of France: Geographical & Administrative Greeting & Taking leave, presenting oneself, someone to someone, Asking & giving identity Grammar- Definite articles (le,la,les, l'),Pronouns-Verb 'avoir' and 'etre', Negatives (ne ~ pas) Days of the week, Months of the year, Numbers, Nationality, Profession, Making a visiting Card Salutations & Taking leave, Gestures & Handshakes.

UNIT-II RENDEZVOUS:

Conversation, Approaching someone, Tele conversation, Give direction to places, Buying a train ticket. Grammar-Verbs "aller", "partir", "venir", "prendre", Definite & Indefinite Articles, Numbers the formula to write a post card, Culture, Life in France.

UNIT-III AGENDA & INVITATION:

Conversation, Time, Fixing a meeting, Grammar-Pronoun 'on', Expression of quantity with partitif article. Possessive Adjectives, verbs "finir" and "faire", Alimentation, Moments of the day, from morning to night. Culture, Punctuality, Good moments of the day, Inviting someone, Accepting & Refusing Invitations, Family tree, Describing a house- interior,

Grammar-Passe Compose, Verbs “savoir”, “vouloir” , “pouvoir”, Future Proche, Pronom Tonique Consists of exercises and images to be used in the class by the students.

UNIT-IV VACATION & SHOPPING:

Describing an event in Past tense, Reservations at a Hotel, Describing a person – Physical & Moral, Expressing opinion, Grammar- Imparfait & Passe Compose, Indication of time – Depuis, pendant, Gestures – Polite & Impolite, A French vacation, Culture, Making a purchase, Choosing & Paying, Trying a dress on, Talking about weather, Understanding a Weather Bulletin, Grammar-Adjectives, Comparison, Dress & weather, Dialogue between a client and an employee of a store, Culture, Money in everyday life in France- Parking ticket / telephone card.

UNIT-V ITINERARY, EXCURSION & WEEKEND:

Asking for way / direction, Giving directions, Giving order / advice / prohibition, Numbers – ordinal Verbs of Movement, Reservation at a restaurant, Taking an order / Asking for bill(Restaurant)Expression of Quantity, Alimentation – portions, Shopping list (portions),Making Suggestion & Proposal, Going for an outing, Acceptance & Refusal of an invitation, Giving arguments / favour & against, Subjonctif-Il faut, pour que Invitation – Refusal or acceptance, A French Weekend.

Text Books:

1. CAMPUS 1 Methode de Francais, Jacques Pecheur et Jacky Girardet, CLE International Paris 2002.
2. La France de toujours, Nelly Mauchamp; CLE international.
3. Sans Frontireres - Vols. 1, 2, & 3 – Hachette.

Reference Books:

1. Declic 1; Jacques Balnc, Jean-Michel Cartier, Pierre Lederlion; CLE International.
2. Nouveau Sans Frontieres – Vols. 1, 2 & 3.
3. Cours de langue et de civilisation Francaise – Hachette.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC19	**DIGITAL COMMUNICATIONS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives

The course will provide the student:

1. To learn the digitization techniques for analog messages.
2. To know the basic principles of baseband pulse transmission.
3. To learn the behaviour of signals in the presence of noise.
4. To know the basic principles of passband data transmission.

Outcomes

At the end of the course, students should be able to:

1. Understand the difference between various digitization techniques for analog messages.
2. Analyze the basics of baseband pulse transmission.
3. Analyze the signals in the presence of noise.
4. Analyze the basics of passband data transmission.

UNIT I SIGNAL SPACE ANALYSIS:

Introduction, Geometric representation of signals, Gram-Schmidt orthogonalization procedure, Conversion of the Continuous AWGN channel into a vector channel, Coherent detection of signals in noise, Correlation receiver, Equivalence of correlation and Matched filter receivers, Probability of error, Signal constellation diagram.

UNIT II SOURCE CODING SYSTEMS:

Introduction, sampling process, quantization, quantization noise, Pulse-Code Modulation (PCM), Line codes, Differential encoding, Regeneration, Decoding & Filtering, Noise considerations in PCM systems, Delta modulation (DM), Differential PCM (DPCM), Processing gain, Adaptive DPCM (ADPCM), Comparison of the above systems.

UNIT III BASEBAND PULSE TRANSMISSION:

Introduction, Matched filter, Properties of Matched filter, Matched filter for rectangular pulse, Error rate due to noise, Inter-symbol Interference (ISI), Nyquist's criterion for distortion less baseband binary transmission, ideal Nyquist channel, Raised cosine filter & its

spectrum, Correlative coding – Duo binary & Modified duo binary signaling schemes, Partial response signaling, Baseband M-array PAM transmission, Eye diagrams.

UNIT IV PASSBAND DATA TRANSMISSION-I:

Introduction, Passband transmission model, Coherent phase-shift keying – binary phase shift keying (BPSK), Quadrature shift keying (QPSK), Binary Frequency shift keying (BFSK), Error probabilities of BPSK, QPSK, BFSK, Generation and detection of Coherent BPSK, QPSK, & BFSK, Power spectra of above mentioned modulated signals

UNIT V PASSBAND DATA TRANSMISSION-II:

M-ary PSK, M-ary quadrature amplitude modulation, Non-coherent orthogonal modulation schemes -Differential PSK, Binary FSK, Generation and detection of non-coherent BFSK, DPSK, Comparison of power bandwidth requirements for all the above schemes.

Text Books:

1. Simon Hakin, "Communication Systems," Wiley India Edition, 4th Edition, 2011.
2. Bruce Carlson A, & Paul B. Crilly, "Communication Systems – An Introduction to Signals &Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.

Reference Books:

1. Sam Shanmugam, "Digital and Analog Communication Systems", John Wiley, 2005.
2. B.P. Lathi, & Zhi Ding, "Modern Digital & Analog Communication Systems", Oxford University Press, International 4th edition, 2010.
3. Bernard Sklar, "Digital Communications", Prentice-Hall PTR, 2nd edition, 2001.
4. Herbert Taub & Donald L Schilling, "Principles of Communication Systems", Tata McGraw- Hill, 3rd Edition, 2009.
5. J. G. Proakis, M Salehi, Gerhard Bauch, "Modern Communication Systems Using MATLAB," CENGAGE, 3rd Edition, 2013.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC20	**LINEAR IC APPLICATIONS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

To familiarize the student

1. With the analysis and design of various differential amplifier circuits.
2. With various negative feedback circuit in an op-amp.
3. With various applications of op-amp.
4. With various D/A and A/D converters.

Outcomes:

The student will be able to:

1. Analyze and Design various differential amplifier circuits.
2. Analyze and Design various circuits using negative feedback.
3. Design and analysis various applications of op-amp.
4. Analyze various D/A and A/D converters.

UNIT I DIFFERENTIAL AMPLIFIERS AND OPAMPS

Differential Amplifiers: Differential amplifier configurations, Balanced and unbalanced output differential amplifiers, current mirror, level Translator.

Operational amplifiers: Introduction, Block diagram, Ideal op-amp, Equivalent Circuit, Voltage Transfer curve& open loop op-amp configurations.

UNIT II OP-AMP WITH NEGATIVE FEEDBACK AND FREQUENCY RESPONSE

Introduction, feedback configurations, voltage series feedback, voltage shunt feedback and differential amplifiers, features of Practical op-amp.

Frequency response: Introduction, compensating networks, frequency response of internally compensated op-amps and non compensated op-amps, High frequency op-amp equivalent circuit, open loop gain Vs frequency, closed loop frequency response, circuit stability and slew rate.

UNIT III OP-AMP LINEAR APPLICATIONS

DC and AC amplifiers, peaking amplifier, summing, scaling and averaging amplifiers, Instrumentation amplifier, voltage to current converter, current to voltage converter, integrator, differentiator, first order LPF and HPF.

UNIT IV NON LINEAR APPLICATIONS

Oscillators, Phase shift and wein bridge oscillators, Comparators, and its types, Square, triangular and saw tooth wave generators, Schmitt trigger, characteristics and limitations.

Specialized applications: 555 timer IC (monostable & astable operation) & its applications, PLL, operating principles and its applications, IC regulators - LM723.

UNIT V ANALOG TO DIGITAL AND DIGITAL TO ANALOG CONVERTERS

Analog and Digital Data Conversions, D/A converter – specifications – weighted resistor type, R-2R Ladder type Inverted R-2R Ladder type DAC,switches for D/A converters, high speed sample-and-hold circuits, A/D Converters –specifications – Flash type –Successive Approximation register type – Single Slope type – Dual Slope type and Counter types.

Text Books:

1. D. Roy Chowdhury, "Linear Integrated Circuits", New Age International (p) Ltd, 2nd Edition, 2013.
2. Ramakanth A. Gayakwad, "Op-Amps & Linear ICs", PHI, 4th edition, 2010

Reference Books:

1. R.F.Coughlin & Fredrick Driscoll, "Operational Amplifiers & Linear Integrated Circuits", 6th Edition, PHI.
2. David A. Bell, "Operational Amplifiers & Linear ICs", Oxford University Press, 2nd edition, 2010.
3. Sergio Franco, "Design with Operational Amplifiers & Analog Integrated Circuits", McGraw Hill, 2010

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC21 MICROPROCESSORS AND MICROCONTROLLERS
(Common to ECE & EEE)

L	T	P	C
3	-	-	3

Objectives:

1. To familiarize the architecture of 8086 processor and its Assembly language programming.
2. To learn about various programmable peripheral devices and their interfacing.
3. To understand and design microprocessor based systems for various applications.
4. To provide the knowledge of 8051 microcontroller concepts, architecture and programming.

Outcomes:

After the completion of the course the students will be able

1. To write 8086 assembly language programs.
2. To use the built in devices of 8051 microcontroller in any application.
3. To Study and understand the architecture and programming of any other microprocessor or microcontroller.
4. To do any type of VLSI and Embedded Systems for Industrial and Real Time applications.

UNIT I 8086 MICROPROCESSOR

Evolution of microprocessors, memory segmentation,8086 Architecture, register organization, Flag Register, Pin Diagram of 8086- Minimum and Maximum mode 8086 systems, Timing Diagrams for Memory Read(MR),Memory Write (MW),IO Read (IOR) and IO Write(IOW) bus cycles.

UNIT II INSTRUCTION SET AND ASSEMBLY LANGUAGE PROGRAMMING OF 8086

Addressing Modes-Instruction Set, Assembler Directives-Macros and procedures, assembly language programs for addition ,subtraction, multiplication, division, GCD and LCM of two numbers, Evaluation of arithmetic expressions, largest and smallest numbers in an array, sorting an array, searching for a number in an array, programs using lookup tables.

UNIT III INTERFACING MEMORY & IO AND APPLICATIONS OF 8086 MICROPROCESSOR

Interfacing memory (static RAM and ROM), programmable input-output port PIO 8255-modes of operation and interfacing with 8086. ADC interfacing, DAC interfacing, waveform generation, traffic light controller, stepper motor control, temperature measurement and control.

INTERFACING DEVICES

DMA data transfer-DMA controller 8257, Asynchronous and synchronous serial data transfer schemes- 8251 USART architecture and interfacing,.

UNIT IV INTRODUCTION TO 8051 MICROCONTROLLER

Architecture, Registers, I/O Ports and Memory Organization, Addressing Modes, Instruction Set, simple assembly language programs using 8051, interrupt structure of 8051-initialization of interrupt, interrupt priorities , timer and counter modes of 8051, serial communication modes of 8051.

UNIT V

Low power RISC MSP430 – block diagram, features and architecture, MSP430x5x series block diagram, Addressing modes, Instruction set, Memory address space.

Text Books:

1. A.K.Ray and K.M.Bhurchandi, “Advanced Microprocessors and Peripherals”, 3rd Edition, 2013 TMH Publications.
2. Ajay V. Deshmukh, “Microcontrollers, Theory and applications”, Tata McGraw-Hill Companies – 2005
3. MSP430 microcontroller basics. John H. Davies, Newness Publication, I st Edition, 2008

Reference Books:

1. Douglas V.Hall, “Microprocessors and Interfacing”, 2nd Revised Edition 2005, TMH Publications.
2. Liu & Gibson, “Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design”, 2nd ed.2003, PHI
3. Kenneth j. Ayala, Thomson, “The 8051 Microcontrollers”, 3ed 2004, Asia Pte.Ltd

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC22	**ANTENNA AND WAVE PROPAGATION**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To introduce the fundamental principles of antenna theory.
2. To expose the students to various types of wire antennas, antenna arrays and their radiation pattern.
3. To apply the principles of antennas to the analysis, design of loop, Yagi - uda antennas and to measure various Antenna parameters.
4. To introduce basic and practical configurations of Horn, Microstrip, reflector and lens antennas and their applications.
5. To study about radio wave propagation.

Outcomes:

At the end of the course, student should be able to

1. Acquire the knowledge on fundamental principles of antenna and different antenna Structures.
2. Design and evaluate the fundamental parameters of antennas and arrays operating at various frequencies from LF to Microwave applications.
3. Analyze different modes of propagation of radio waves and identify their characteristics.
4. Identify the Atmospheric and Terrestrial effects on radio wave propagation.

UNIT I ANTENNA BASICS:

Introduction, radiation mechanism, antenna parameters- patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity, Gain, Resolution, Antenna Apertures, Effective height, Illustrative problems. Antenna field zones, Antenna temperature, front–to-back ratio, antenna theorems, retarded potential-Helmholtz Theorem..

UNIT II WIRE ANTENNAS AND ANTENNA ARRAYS:

Thin Linear Wire Antennas: Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Field Components, Radiated power and Radiation resistance

ARRAYS OF ISOTROPIC SOURCES: Principle of Pattern Multiplication, Uniform Linear Arrays – Broadside Arrays, End fire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison, BSA with Non-uniform Amplitude Distributions- General considerations and Binomial Arrays.

UNIT III ANTENNA MEASUREMENTS AND VHF, UHF:

Antenna Measurements: Radiation Pattern Measurement Arrangement, Directivity Measurement and Gain Measurements (by Comparison & Absolute Methods).

LOOP ANTENNAS: Introduction, Small Loop, Comparison of far fields of small loop and short dipole, Radiation Resistances and Directivities of small loops, Yagi - Uda Arrays, Folded Dipoles & their characteristics. Helical Antennas-Helical Geometry, Helix modes, Practical Design considerations for Monofilar Helical Antenna in Axial and Normal Modes.

UNIT IV MICROWAVE ANTENNAS:

Horn Antennas- Types, Design Considerations of Horns, Micro strip Antennas- Introduction, features, advantages and limitations, characteristics of Micro strip antennas,

Reflector antennas- Introduction, Flat sheet and corner reflectors, paraboloidal reflectors-geometry, pattern characteristics, Feed Methods.

Lens Antennas: Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning and Applications.

UNIT V WAVE PROPAGATION:

Introduction, different modes of wave propagation, Ground wave propagation - Introduction, Plane earth reflections, Space and surface waves, wave tilt, curved earth reflections.

Space wave propagation- Introduction, field strength variation with distance and height, effect of earth's curvature, absorption. Super refraction, M-curves and duct propagation, scattering phenomena, troposphere propagation, fading and path loss calculations.

Sky wave propagation: Introduction, structure of Ionosphere, refraction and reflection of sky waves by Ionosphere, Ray path, Critical frequency, MUF, LUF, OF, Virtual height and Skip distance, Relation between MUF and Skip distance and Multi-HOP propagation.

Text Books:

1. John D. Kraus and Ronald J. Marhefka and Ahmad S.Khan, "Antennas and wave propagation", TMH, New Delhi, 4th Ed., (special Indian Edition), 2010.

2. K.D. Prasad, Satya Prakashan, “Antennas and Wave Propagation”, Tech. India Publications, New Delhi, 2001.

Reference Books:

1. E.C. Jordan and K.G. Balmain, “Electromagnetic Waves and Radiating Systems”, PHI, 2ndEdn, 2000.
2. C.A. Balanis, “Antenna Theory- Analysis and Design”, John Wiley & Sons, 2nd Edn.,2001.
3. John D. Kraus, “Antennas”, McGraw-Hill (International Edition), 2ndEdn., 1988.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
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III B.Tech I Semester ECE

Code: 17AEC23	**DIGITAL IC APPLICATIONS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

1. Define a hardware design utilizing the three basic VHDL modeling styles: Data flow, Structural and Behavioral.
2. Design a Combinational Logic Circuits and Sequential Logic Circuits utilizing VHDL.
3. To be able to use computer-aided design tools for development of complex digital logic Circuits.
4. To be able to model, simulate, verify, analyze, and synthesize with hardware description languages.

Outcomes:

1. The student will understand the basics of VHDL and design digital systems using a hardware description Language, VHDL.
2. Able to use computer-aided design tools for development of complex digital logic circuits.
3. Able to model, simulate, verify, analyze, and synthesize with hardware description languages.
4. Able to design and prototype with standard cell technology and programmable logic.

UNIT I CMOS LOGIC:

Introduction to logic families, CMOS logic, CMOS Steady-State Electrical behavior, CMOS Dynamic Electrical behavior and CMOS logic families.

BIPOLAR LOGIC AND INTERFACING: Bipolar logic-TTL families, CMOS/TTL Interfacing, Emitter Coupled Logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs and its Specifications.

UNIT II VHDL HARDWARE DESCRIPTION LANGUAGE:

HDL-Based Design Flow, Program Structure, Types, Constants and Arrays, Functions and Procedures, Libraries and Packages, Structural Design Elements, Data Flow Design Elements, Behavioral Design Elements, The Time Dimension, Simulation and Synthesis.

UNIT III COMBINATIONAL LOGIC DESIGN PRACTICES:

Decoders, Encoders, Three-State Devices, Multiplexers and Demultiplexers, Exclusive-OR Gates and Parity Circuits, Comparators, Adders, Subtractors and ALUs, Barrel Shifter and their VHDL models for the above Standard ICs.

UNIT IV SEQUENTIAL LOGIC DESIGN PRACTICES:

Latches and Flip-flops, Multibit Registers and Latches, Shift Registers-MSI Shift Registers, Counters-Ripple Counters, Synchronous Counters, MSI Counters and Applications, Ring Counters, Johnson counters, LFSR Counter and their VHDL models for the above Standard ICs.

UNIT V SEMICONDUCTOR MEMORIES:

ROMs: Internal Structure, Two-Dimensional decoding, Commercial ROM types, Timing and Applications.

Static RAM: Internal Structure, SRAM timing, Standard SRAMs, Synchronous SRAMs.

Dynamic RAMs: Internal Structure, Timing and standard DRAMs, Synchronous DRAMs.

Text Books:

1. John F. Wakerly, "Digital Design Principles and Practices", PHI/Pearson Education, 4th Edition, 2009.
2. Charles H.Roth, Jr., "Fundamentals of Logic Design", 5th edition, CENGAGE Learning 2012.

Reference Books:

1. J. Bhasker, "A VHDL Primer", Pearson Education/PHI, 3rd Edition, 2010.
2. Stephen Brown and Zvonko Vranesic, "Fundamentals of Digital Logic with VHDL Design", McGraw Hill, 2nd Edition, 2005.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC46	**MATERIAL SCIENCE**	**L**	**T**	**P**	**C**
	(Professional Elective-I)	**3**	**-**	**–**	**3**

Objectives:

1. To understand physical and chemical properties of materials including metals, insulators, ceramics, and the reasons for these properties to exist.
2. To understand the importance of various Engineering materials used in mechanical process and electronics/industries.
3. To understand the electrical behavior of materials in practical applications
4. To understand the magnetic and optical behavior of materials in practical applications
5. To understand the behavior and production of products using composite materials.

Outcomes:

After completion of course the student will be able to:

1. Make a right choice of material to suit the functional behavior of a product.
2. Can modify the required properties of materials in easy way.
3. Identify problem areas in the production and usage of metals and alloy products and take Corrective measures.
4. Predict the behavior of metals and suggest modifications to the designer, for increased life and low cost of products.

UNIT I INTRODUCTION

Historical perspective of Materials Science. Properties of materials, Classification of materials, Advanced Materials, Future materials and modern materials, **Atomic Structure,** Atomic structure ,Atomic bonding in solids, Crystal structures, Crystalline and non crystalline materials. Miller indices. Anisotropic elasticity. Elastic behavior of composites.

UNIT II DIELECTRIC MATERIALS

Properties of dielectrics ,different kinds of dielectric polarizations, Ferro electric materials ,applications of ferro electric crystals.

Conducting Materials

Electron in periodic potential Brillouinzones in 2 dimensions, Electron movement in metal. Semiconductors Band theory in solids ,Theory of semiconductors ,Classification of semiconductors, Carrier concentration in intrinsic semiconductor**.**

UNIT III MAGNETIC MATERIALS

Different types of magnetic materials, Ferro magnetism ,Quantum theory of paramagnetism, Molecular field theory of ferromagnetism ,Curi temperature, Domain interpretation of hysteresis curve.

Optical materials

Optical phenomena, Optical absorbance in metals, application of optical devices.

Superconducting Materials

Type-I, Type-II super conductors, Theories for superconductivity, Properties of superconducting materials, Applications of super conductors.

UNIT IV SUPERCONDUCTING MATERIALS

Type-I, Type-II super conductors, Theories for superconductivity, Properties of superconducting materials, Applications of super conductors.

Micro Electronic Materials

Special Properties of Silicon, Lithographic technique

UNIT V GLASS MATERIALS

Manufacture of glass, Kinds of glasses, Properties and applications of glasses.

Ceramic Materials

Classifications and properties of ceramics, Fabrication methods.

Nano Materials & Nano Technology

Manufacture of nano materials, Nano technology in biological studies, Areas of commercial applications in nano technology.

Text Books

1. Material Science & Metallurgy by C.Daniel Yesudian & D.G Harris Samuel – SCITECH

Reference Books:

1. Material Science & Metallurgy by O. P.Khanna- Dhanapt Rai Publications.
2. Material Science & Metallurgy by V.D.Kodgire and S.V.Kodgire-Everest Publishing House.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC47	**MEMS**	**L**	**T**	**P**	**C**
	(Professional Elective-I)	**3**	**-**	**-**	**3**

Objectives:

The course will provide the student:

1. To learn basics of Micro Electro Mechanical Systems (MEMS).
2. To learn about various sensors and actuators used in MEMS.
3. To learn the principle and various devices of MOEMS, Fluidic
4. To learn about RF MEMS and Chemical and Bio Medical Micro Systems

Outcomes:

After the completion of the course, the student will be able to:

1. Understand about various devices of MEMS and their applications
2. Understand about various sensors and actuators used in MEMS.
3. Understand about the principle and various devices of MOEMS, Fluidic, bio and chemical systems.
4. Understand about RF MEMS and Chemical and Bio Medical Micro Systems

UNIT I INTRODUCTION:

Definition of MEMS, MEMS history and development, micro machining, lithography principles & methods, structural and sacrificial materials, thin film deposition, impurity doping, etching, surface micro machining, wafer bonding, LIGA. **MECHANICAL SENSORS AND ACTUATORS**: Principles of sensing and actuation: beam and cantilever, capacitive, piezo electric, strain, pressure, flow, pressure measurement by micro phone, MEMS gyroscopes, shear mode piezo actuator, gripping piezo actuator, Inchworm technology.

UNIT II THERMAL SENSORS AND ACTUATORS:

Thermal energy basics and heat transfer processes, thermisters, thermo devices, thermo couple, micro machined thermo couple probe, peltier effect heat pumps, thermal flow sensors, micro hot plate gas sensors, MEMS thermo vessels, pyro electricity, shape memory alloys (SMA), U-shaped horizontal and vertical electro thermal actuator, thermally activated MEMS relay, micro spring thermal actuator, data storage cantilever.

UNIT III MICRO-OPTO-ELECTRO MECHANICAL SYSTEMS:

Principle of MOEMS technology, properties of light, light modulators, beam splitter, micro lens, micro mirrors, digital micro mirror device (DMD), light detectors, grating light valve (GLV), optical switch, wave guide and tuning, shear stress measurement.

UNIT IV MAGNETIC SENSORS AND ACTUATORS:

Magnetic materials for MEMS and properties, magnetic sensing and detection, magneto resistive sensor, more on hall effect, magneto diodes, magneto transistor, MEMS magnetic sensor, pressure sensor utilizing MOKE, mag MEMS actuators, by directional micro actuator, feedback circuit integrated magnetic actuator, large force reluctance actuator, magnetic probe based storage device.

MICRO FLUIDIC SYSTEMS: considerations on micro scale fluid, fluid actuation methods, dielectro phoresis (DEP), electro wetting, electro thermal flow, molecular gate, micro pumps.

UNIT V RADIO FREQUENCY (RF) MEMS:

RF – based communication systems, RF MEMS, MEMS inductors, varactors, tuner/filter, resonator, clarification of tuner, filter, resonator, MEMS switches, phase shifter.

CHEMICAL AND BIO MEDICAL MICRO SYSTEMS: Sensing mechanism & principle, membrane-transducer materials, chem.-lab-on-a-chip (CLOC) chemoresistors, chemocapacitors, chemotransistors, electronic nose (E-nose), mass sensitive chemosensors, fluroscence detection, calorimetric spectroscopy.

Text Books

1. MEMS, Nitaigour Premchand Mahalik, TMH Publishing co. 1st Edition. 2007
2. Foundation of MEMS, Chang Liu, Prentice Hall Ltd. 2nd Edition, 2011.

Reference Books

1. MEMS and NEMS, Sergey Edwrd Lyshevski, CRC Press, Indian Edition. 1st Edition, 2002.
2. MEMS and Micro Systems: Design and Manufacture, Tai-Ran Hsu, TMH Publishers. 1st Edition, 2002.
3. Introductory MEMS, Thomas M Adams, Richard A Layton, Springer International Publishers. 1st Edition, 2010.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC48	**COMPUTER ARCHITECTURE**	**L**	**T**	**P**	**C**
	(Professional Elective-I)	**3**	**-**	**-**	**3**

Objectives:

The objective of this course is to make students to

1. Understand the structure of Computers.
2. Acquire knowledge in register transfer, micro operations and address sequencing
3. Understand memory system
4. Understand I/O organization.
5. Understand parallelism and pipeline concepts.

Outcomes:

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

1. Evaluate computer architecture and organization.
2. Understand micro programmed control arithmetic.
3. Understand memory system.
4. Understand accessing I/O devices.
5. Obtain technical knowhow of the advantage of instruction level parallelism and pipelining for high performance processor design.

UNIT I STRUCTURE OF COMPUTERS:

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

UNIT II REGISTER TRANSFER:

Register Transfer Language – Register Transfer – Bus and Memory Transfers – Arithmetic Micro operations – Logic Micro operations – Shift Micro operations. Arithmetic logic shift unit

CONTROL UNIT: Control Memory – Address Sequencing – Micro program Example – Design of Control Unit

UNIT III MEMORY ORGANIZATION:

Memory hierarchy, Main memory-RAM, ROM chips, Virtual memory-Memory Management requirements, Memory address map, memory contention to CPU, Associative Memory-Hardware logic, match, read and write logic, Cache Memory-Associative mapping, Direct mapping, Set-associative mapping, hit and miss ratio.

UNIT IV INPUT -OUTPUT ORGANIZATION:

Peripheral devices, input-output interface-I/0 Bus and interface modules, I/O versus Memory bus, isolated versus memory mapped I/O, Modes of transfer-Programmed I/O, Interrupt-initiated I/O, priority interrupts-Daisy chaining, parallel priority, interrupt cycle, DMA-DMA control, DMA transfer, Input output processor-CPU-IOP communication.

UNIT V PIPELINING:

Basic Concepts, Parallel processing, Pipelining, Arithmetic pipelining, Instruction pipelining, RISC pipelining, Data Hazards, Instruction hazards, Vector processing, Array processors, Characteristics of multiprocessors, interconnection structures, inter processor communication and synchronization.

Text Books:

1. M. Moris Mano, Computer System Architecture, 3rd edition, PHI, India,2006.
2. Carl Hamacher, ZvonksVranesic, SafeaZaky, Computer Organization, 5th edition, McGraw Hill, New Delhi, India,2002.

Reference Books:

1. William Stallings, Computer Organization and Architecture- designing for performance, 8th edition, Prentice Hall, New Jersy,2010.
2. Andrew S. Tanenbaum, Structured Computer Organization, 5th edition, Pearson Education Inc, New Jersy,2006.
3. Sivarama P. Dandamudi, Fundamentals of Computer Organization and Design, 3th edition 2003

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC49 MEDICAL ELECTRONICS

(Professional Elective-I)

L	T	P	C
3	-	-	3

Objectives:

To familiarize the student:

1. With the basic medical instrumentation system and its requirements.
2. With various biomedical recorders.
3. About the working of Cardiac Pacemakers, Defibrillators, and Haemodialys is machine.
4. About the working principle of X-ray machine, X-ray CT and Nuclear Magnetic Resonance system.

Outcomes:

After the completion of the course, the student will be able to:

1. Understand the basic medical instrumentation system and its requirements.
2. Understand various biomedical recorders.
3. Analyze the importance of Cardiac Pacemakers, Defibrillators, and Haemodialys is machine. Analyze the working principle of X-ray machine, X-ray CT and Nuclear Magnetic Resonance system.

UNIT I FUNDAMENTALS OF MEDICAL INSTRUMENTATION:

Anatomy and Physiology, Physiological systems of the body, Sources of Biomedical signals, Basic Medical Instrumentation System, Performance requirements of medical instrumentation system, Intelligent medical instrumentation system and general constraints in design of medical instrumentation system.

UNIT II ELECTRODES AND BIOMEDICAL RECORDERS:

Recording Electrodes, Silver-silver Chloride electrodes, Electrodes for ECG, Electrodes for EEG, Electrodes for EMG, Electrical Conductivity of Electrode Jellies and Creams and Microelectrodes.

Electrocardiograph, Vectorcardiograph, Phonocardiograph, Electroencephalograph and Electromyograph.

UNIT III THERAPEUTIC AND PROSTHETIC DEVICES:

Cardiac Pacemakers: Need for Cardiac Pacemaker, External Pacemakers, Implantable Pacemakers and Recent developments in Implantable Pacemakers.

Cardiac Defibrillators: Need for a Defibrillator, DC Defibrillator and Implantable Defibrillators.

Schematic Diagram of a Haemodialysis Machine, High frequency Heat Therapy, Short-wave Diathermy and Microwave Diathermy.

UNIT IV ELECTRICAL SAFETY:

Physiological effects of Electricity, Important Susceptibility parameters, Distribution of electric power, Macroshock and Microshock Hazards, Electrical safety codes and standards, Basic approaches to protection against shock, Protection: Power distribution and Equipment design, Electrical safety analyzers, Testing the electric system and Tests of electric appliances.

UNIT V MEDICAL IMAGING SYSTEMS:

Basic Principle and Block diagram of X-ray machine, Basic Principle and Technique of X-ray Computed Tomography, Basic Nuclear Magnetic Resonance components, Positron Emission Tomography, Ultrasonography: A-Scan, M-Mode, B-Scanner and Real Time Ultrasonic Imaging Systems.

Text Books:

1. R.S.Khandpur, 'Handbook of Bio-Medical instrumentation', Third Edition, McGraw Hill Education (India) Private Limited, 2014.
2. John G.Webster, 'Medical Instrumentation Application and Design', Third Edition, John Wiley & Sons, 2009.

Reference Books:

1. Leslie Cromwell, Fred J.Weibell, Erich A.Pfeiffer, 'Bio-Medical Instrumentation and Measurements', Second Edition, Prentice Hall of India, 2004.
2. Joseph J.Carr and John M.Brown, 'Introduction to Biomedical Equipment Technology', Fourth Edition, PHI, 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC50 INFORMATION THEORY AND CODING TECHNIQUES

(Professional Elective-I)

L	T	P	C
3	-	-	3

Objectives

The course will provide the student:

1. To study the concepts of information theory.
2. To learn the basics of block codes.
3. To learn the error detection and correction in linear block codes.
4. To learn the error detection and correction in convolutional codes.

Outcomes

At the end of the course, students should be able to:

1. To understand the concepts of information theory.
2. To analyze the basics of block codes.
3. To analyze the error detection and correction in linear block codes.
4. To analyze the error detection and correction in convolutional codes.

UNIT I Information Theory:

Introduction, Unit of Information, Entropy, Rate of Information, Joint Entropy and Conditional Entropy, Mutual Information, Channel Capacity, Binary Symmetric Channel, Shannon's Theorem, Capacity of a Gaussian Channel: Shannon- Hartley theorem, Coding Efficiency, Shannon- Fano Coding, Huffman Coding.

UNIT II Block Codes:

Introduction to Block Codes, Single Parity Check Codes, Product Codes, Repetition Codes, Hamming Codes, Minimum Distance of Block Codes, Automatic- Repeat- Request Schemes.

UNIT III Linear Codes:

Definition of Linear Codes, Generator Matrices, Parity Check Matrices, Error Syndromes, Error Detection and Correction.

UNIT IV Cyclic Codes:

Definition of Cyclic Codes, Polynomials, Generator Polynomials, Encoding Cyclic Codes, Decoding Cyclic Codes, Parity Check Polynomials, Linear Feedback Shift Registers, Polynomial- Division Register, Registers for Encoding, Registers for Error Detection and Correction.

UNIT V Convolutional Codes:

Introduction, Encoder for Convolutional Codes, Code Tree, Trelli's Diagram, State Diagram, Decoding of Convolutional Code using Viterbi Algorithm.

Text Books:

1. Salvatore Gravano, "Introduction to Error Control Codes", Oxford University Press, 2007.
2. R. P. Singh & S. D. Sapre, "Communication Systems- Analog and Digital", Tata McGraw- Hill, 3rd Edition, 2012.

Reference Books:

1. Shu Lin, Daniel J. Costello, Jr., "Error Control Coding," Pearson Publications, Second Edition, 2011.
2. Bernard Sklar, Pabitra Kumar Ray, "Di gital Communications- Fundamentals and Applications", Pearson Publications, Second Edition, 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY.

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC24	**LINEAR IC APPLICATIONS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

1. To verify the applications of Op-amp.
2. To verify the applications of IC555 and IC566.
3. To acquire knowledge about IC regulators.
4. To know about various converters.

Outcomes:

1. Able to verify applications of Op-amp.
2. Able to verify applications of IC555 and IC566.
3. Able to use IC regulators in practical applications.
4. Able to use data converters in practical applications..

LIST OF EXPERMENT

(Minimum Ten Experiments to be conducted)

1. Study of OP AMPs – IC 741, IC 555, – functioning, parameters and Specifications.

OP AMP Applications (IC 741)

2. Adder, Subtractor, Comparator Circuits.
3. Integrator
4. Differentiator.
5. Active Filter Applications – LPF, HPF (first order)
6. Phase Shift Oscillator
7. Wien Bridge Oscillator.
8. Function Generator.
9. 4 bit DAC using OP AMP.

IC 555 Timers

10. Monostable Multivibrator.
11. Astable Multivibrator.
12. Schmitt Trigger.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC25	**DIGITAL IC APPLICATIONS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

The course will provide the student to:

1. Use computer-aided design tools for development of complex digital logic circuits.
2. Model, Simulate, Verify and Analyze with hardware description languages.
3. Synthesize various digital circuits using HDL.
4. Performance the analysis of digital system design.

Outcomes:

On completion of the course the student will be

1. Able to use computer-aided design tools for development of complex digital logic circuits.
2. Able to Model, Simulate, Verify and Analyze with hardware description languages.
3. Able to synthesize various digital circuits using HDL.
4. Able to analyze the performance of digital system design.

List of Experiments

(Minimum 10 Experiments to be conducted)

1. Logic Gates – 74XX.
2. Half Adder, Full Adder and Ripple Carry Adder.
3. Half Subtractor and Full Subtractor.
4. i) 3-8 Decoder – 74X138. ii) 8-3 Encoder – 74X148.
5. i) 8x1 Multiplexer – 74X151. ii) 2x4 Demultiplexer – 74X155.
6. 4-bit Comparator – 74X85.
7. D Flip-Flop – 74X74.
8. JK Flip-Flop – 74X109.
9. 4-bit Universal Shift Register – 74X194.
10. 4-bit Synchronous Binary Counter – 74X163.
11. Decade Counter – 74X90.
12. 4-bit ALU – 74X382.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC26	**ANALOG COMMUNICATIONS AND DIGITAL COMMUNICATIONS LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives

1. To understand and compare different analog modulation and demodulation schemes.
2. To understand and compare different pulse modulation and demodulation schemes.
3. To measure radio receiver characteristics.
4. To understand and compare different digital modulation and demodulation schemes.

Outcomes

After completion of the course, the students will be able to

1. Analyze different analog modulation and demodulation schemes.
2. Analyze different pulse modulation and demodulation schemes.
3. Measure radio receiver characteristics.
4. Analyze different digital modulation and demodulation schemes.

LIST OF EXPERIMENTS

Part A (Analog Communication Lab):

(Minimum 6 Experiments to be conducted)

1. Amplitude modulation and Demodulation.
2. Frequency modulation and Demodulation.
3. Characteristics of Mixer.
4. Pre-emphasis & De-emphasis.
5. Pulse Amplitude Modulation and Demodulation.
6. Pulse Width Modulation and Demodulation.
7. Pulse Position Modulation and Demodulation.
8. Radio Receiver measurements – Sensitivity, Selectivity & Fidelity.

Part B (Digital Communication Lab):

(Minimum 6 Experiments to be conducted)

1. Sampling Theorem – Verification.
2. Time division multiplexing.
3. Pulse Code Modulation and Demodulation.
4. Delta modulation and Demodulation.
5. Frequency shift keying - Modulation and Demodulation.
6. Phase shift keying - Modulation and Demodulation.
7. Differential phase shift keying - Modulation and Demodulation.
8. QPSK - Modulation and Demodulation.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC27	**COMPREHENSIVE ONLINE EXAMINATION**	**L**	**T**	**P**	**C**
		-	**-**	**-**	**0.5**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech I Semester ECE

Code: 17AEC80 MOOC- I

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC30	**MICROWAVE ENGINEERING**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To analyze micro-wave transmission lines such as rectangular waveguides.
2. To use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc. To give basic knowledge on microwave tube devices and solid state devices such as Gunn diode, Varactor diode etc.
3. To give maximum knowledge on micro wave bench setup for measurement purpose.

Outcomes:

On completion of the course the student will be able to:

1. Understand the various mode of a rectangular waveguide.
2. Understand the usage microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
3. Understand the various principles involved in various Microwave oscillators and amplifiers such as Klystron tubes, TWT and magnetron, Microwave solid state devices.
4. Set up the microwave bench for measurement of various parameters such as microwave frequency, VSWR, Impedance of unknown load etc.

UNIT I MICROWAVE TRANSMISSION LINES

Introduction, Microwave spectrum and bands, applications of Microwaves. Rectangular Waveguides-Wave Equation in Rectangular Coordinates, TE/TM mode analysis, Expressions for fields, Characteristic equation and cutoff frequencies, filter characteristics, dominant and degenerate modes, sketches of TE and TM mode fields in the cross-section. Mode characteristics - Phase and Group velocities, wavelengths and impedance relations.

Rectangular Waveguides – Power Transmission and Power Losses, Impossibility of TEM Modes, Types of microwave transmission lines, Micro strip lines-introduction, Z0 relations, effective dielectric constant, losses, Q-factor.

UNIT II WAVEGUIDE COMPONENTS AND APPLICATIONS

Coupling mechanisms- probe, loop, aperture types. Wave guide discontinuities - waveguide Windows, tuning screws and posts, matched loads. Waveguide attenuators - resistive card,

rotary vane Attenuators; waveguide phase shifters-dielectric, rotary vane phase shifters. Wave guide multiport junctions- E plane and H plane Tees, Magic Tee, Directional couplers-2 hole and Bethe hole types. Ferrites-composition and characteristics, Faraday rotation, Ferrite components-Gyrator, Isolator, Circulator, Scattering Matrix-Significance, Formulation and properties. S Matrix calculations for 2-port junction, E plane and H plane Tees, Magic Tee, Directional coupler, circulator and Isolator.

UNIT III MICROWAVE TUBES

Limitations and losses of conventional tubes at microwave frequencies, Microwave tubes-O type and M type classifications.

O-type tubes: Two cavity Klystrons-structure, Reentrant cavities, velocity modulation process and Applegate diagram, bunching process and small signal theory-Expressions for output power and efficiency, Reflex Klystrons-structure, Velocity Modulation, Applegate diagram, mathematical theory of bunching, power output, efficiency , oscillating modes and output characteristics, Effect of Repeller Voltage on Power Output. Difference between TWT & Klystron.

M-Type Tubes: Introduction, cross field effects, Magnetrons-different types, cylindrical travelling wave magnetron-Hull cutoff, modes of resonance and PI-mode operation (qualitative treatment only).

UNIT IV MICROWAVE SOLID STATE DEVICES

Introduction, classification, applications, Transfer Electronic Devices, Gunn diode - principles, RWH theory, characteristics, basic modes of operation - Gunn oscillation modes. LSA Mode, Varactor Diode, Parametric Amplifier. (Qualitative treatment only).

UNIT V MICROWAVE MEASUREMENTS

Description of Microwave bench-different blocks and their features, errors and precautions; Microwave power measurement - Bolometers, Measurement of attenuation, frequency, standing wave measurements –measurement of low and high VSWR, cavity-Q, impedance measurements.

Text Books:

1. Samuel Y. Liao, Microwave Devices and Circuits, Pearson, 3rd Edition, 2008.
2. M. Kulkarni, Microwave and RADAR Engineering, Umesh Publications, 3rd Edition, 2009.

Reference Books:

1. Herbert J.Reich, J.G.Skalnik, P.F.Ordung and H.L.Krauss, Microwave Principles, CBS publishers and distributors, New Delhi, 2009.
2. R.E.Collin, Foundations for Microwave Engineering, IEEE press, John Wiley, 2nd Edition, 2007.
3. L.Sisodia and G.S.Raghuvanshi, Microwave Circuits and Passive Devices, Wiley Eastern Ltd.,New age International publishers Ltd., 2005.
4. Das. A, Microwave Engineering, TMH, 2nd Edition, 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS),

III B.Tech II Semester ECE

Code: 17AEC31 ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

L	T	P	C
3	1	-	3

Objectives:

The course will provide the student to:

1. Study about functioning of different meters associated with measurements of signal characteristics
2. Study and employ CRO for measuring Signal characteristics
3. Study in detail about different bridges employed for Electronic measurements
4. Study the working principles of different advanced measuring instruments such as logic analyzers and spectrum analyzers.

Outcomes:

After the completion of the course the student will be able to

1. Understand basic principles involved in the meters for measuring voltage, current, resistance and frequency.
2. Employ CRO for measuring voltage, current and frequency.
3. Understand principle of measurements associated with different bridges.
4. Get complete knowledge regarding working of advanced instruments such as logic analyzers and spectrum analyzers.

UNIT I PERFORMANCE CHARACTERISTICS OF INSTRUMENTS:

Performance characteristics, Static characteristics, Errors in Measurement, types of static error, sources of error, dynamic characteristics, statistical analysis. DC ammeters, Multirange ammeters, Universal shunt, Extending of Ammeter ranges, DC voltmeter- Multirange, Extending voltmeter ranges, Loading, Transistor voltmeter, AC voltmeters using halfwave and fullwave rectifier, Multirange AC voltmeter, Series type and Shunt type ohmmeter, multimeter for voltage, current and resistance measurements.

UNIT II OSCILLOSCOPES:

Basic principle, CRT features, Block diagram of Oscilloscope, derivation of deflection sensitivity, Simple CRO, Vertical amplifier, Horizontal deflecting system, Triggered sweep CRO, Trigger pulse circuit, Delay line in triggered sweep, Typical CRT connections,

Travelling wave type CRT, Dual Beam CRO, Dual Trace oscilloscope, Sampling and Storage oscilloscope, Digital readout oscilloscope, , Measurement of amplitude, frequency and phase (Lissajous method) and principle of Digital storage oscilloscope.

UNIT III SIGNAL GENERATORS:

Fixed and variable AF oscillators, Standard signal generator, Square Pulse, Random noise and sweep generator- principles of working (Block diagram approach).

ANALYZERS: Introduction, Basic Wave analyzers, Frequency selective wave analyzer, heterodyne wave analyzer, Harmonic distortion analyzers, Spectrum analyzers.

UNIT IV DC BRIDGES:

Wheatstone bridge, Kelvin's Bridge and precautions to be taken when using bridges.

AC BRIDGES: Capacitance comparison bridge, Inductance Comparison Bridge, Maxwell's, Hay's, Schering Wien's and Resonance Bridge.

UNIT V TRANSDUCERS:

Introduction, Classification of transducers, Active and passive transducers, Resistive transducer, Strain gauges, LVDT, Pressure Inductive transducer, Capacitive transducer, Load Cell, Piezo electrical and Photo Electric transducer, Temperature transducers: RTD, Thermistors and Thermocouple.

Text Books:

1. H.S.Kalsi, "Electronic instrumentation", Third Edition, Tata McGraw Hill, 2015.
2. A.D. Helfrick and W.D. Cooper, "Modern Electronic Instrumentation and Measurement Techniques", PHI, 5th Edition, 2002.

Reference Books:

1. Ernest O Doebelin and Dhanesh N Manik, "Measurement Systems Application and Design",TMH, 5th Edition, 2009.
2. Robert A.Witte, "Electronic Test Instruments, Analog and Digital Measurements", Pearson Education, 2nd Ed., 2004.
3. David A. Bell, "Electronic Instrumentation & Measurements", PHI, 2nd Edition, 2003.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC28	DIGITAL SIGNAL PROCESSING (Common to ECE & EEE)	L	T	P	C
		3	1	-	3

Objectives:

The course will provide the student:

1. To apply Z-transform to find response and to analyze digital systems.
2. To apply DFT for the analysis of digital signals and systems
3. To design filters to suit specific requirements for specific applications.
4. To realize digital filters using different structures.
5. To study the concept of multirate signal processing and its applications

Outcomes:

On completion of the course the student will be able to:

1. Analyze digital systems by applying Z-transform.
2. Compute DFT and IDFT using Fast Fourier Transforms.
3. Realize digital filters with different structures.
4. Design and analyze digital filters to suit specific requirements.
5. Demonstrate the concepts of multi rate signal processing and its applications.

UNIT I DISCRETE TIME SYSTEMS:

stem function H(Z), Stability analysis using system function, Response of a digital system using Z- transforms- Natural response, Forced response and total response, Frequency spectrum of discrete time systems.

DISCRETE FOURIER TRANSFORM AND FAST FOURIER TRANSFORM: Discrete Fourier Transforms (DFT)- DFT from DTFT, IDFT, Properties of DFT, Direct Computation of DFT and IDFT, circular convolution, Linear convolution using circular convolution. Fast Fourier transforms (FFT) - Radix2 decimation in time and decimation in frequency FFT algorithms, computation of IDFT through FFT.

UNIT II REALIZATION OF DIGITAL FILTERS:

IIR Filter structures: Direct form-I realization, Direct form-II realization, Transposed forms, Cascade form structure, Parallel form structure, Lattice structure for first and second order IIR systems.

FIR Filter structures: Direct form, Transposed form and Cascade form structures, Minimum multiplier structure for linear phase FIR filters, Lattice structure for first order and second order FIR systems.

UNIT III DESIGN OF IIR FILTERS:

Analog filter approximations - Butterworth and Chebyshev, Analog frequency transformation to transform low pass to high pass, band pass and band stop filters, Design of IIR filters from analog filters: Backward difference method, Impulse invariant technique and Bilinear transformation, Illustrative Problems.

UNIT IV DESIGN OF FIR FILTERS: Design of FIR digital Filters - Fourier series method, Windowing method - Rectangular window, Bartlett window, Hamming window, Hanning window, Blackman window, Frequency sampling method, comparison of IIR and FIR filters, Illustrative Problems.

UNIT V MULTIRATE DIGITAL SIGNAL PROCESSING:

Basic sample rate alteration devices, Multirate Structures for sampling rate Converters, Multistage design of decimator and Interpolator, Polyphase Decomposition, Applications of Multirate Digital Signal Processing

Text Books:

1. John G. Proakis, Dimitris G.Manolakis, Digital signal processing, principles, Algorithms and applications, Pearson Education/PHI, 4th ed., 2007.
2. Anand Kumar. A, Digital Signal Processing, PHI Learning Private Limited, 2013.

Reference Books:

1. Sanjit K. Mitra, Digital Signal Processing, A computer base approach, Tata McGraw Hill, 3rd edition, 2009.
2. Andreas Antoniou, Digital Signal Processing, TATA McGraw Hill, 2006.
3. M. H. Hayes, Digital Signal Processing, Schaum's Outlines, TATA Mc-Graw Hill, 2007.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC32	**VLSI Design**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives

The course will provide the student:

1. To introduce basic NMOS, CMOS & Bi-CMOS circuits.
2. To study different MOS logic circuits.
3. To understand CPLDs and FPGAs.
4. To understand the design of various subsystems
5. To understand the different testing techniques

Outcomes

After completion of the course, the student will

1. Gain knowledge of different VLSI fabrication processes and CMOS Logic Design.
2. Be able to Design different MOS logical circuits.
3. Be able to Design for Programmable architectures such as, PLDs, CPLDs and FPGAs.
4. Be able to design various subsystems.
5. Be able to know about need for testing and different testing techniques.

UNIT I INTRODUCTION:

Introduction to IC technology, MOS and related technology, basic MOS transistors, Fabrication of NMOS, CMOS (P-well, N-well and Twin-tub process) and Bi-CMOS process, IC process - Oxidation, Lithography, Diffusion, Ion implantation, Metallization and Encapsulation.

BASIC ELECTRICAL PROPERTIES OF MOS AND BICMOS CIRCUITS: Ids–Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit ω0; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT II BASIC CIRCUIT CONCEPTS:

Sheet Resistance Rs and its concepts to MOS, Area Capacitance calculations, Inverter Delays, Driving large Capacitive Loads, Propagation delay, Wiring Capacitances and Choice of layers.

GATE LEVEL DESIGN: Logic gates and other complex gates, Switch logic, Alternate gate circuits.

UNIT III VLSI CIRCUIT DESIGN PROCESSES:

VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2μm CMOS Design rules for wires, Contacts and Transistors, Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

VLSI DESIGN STYLES: Full-custom, Standard Cells, Gate-arrays, FPGAs and CPLDs

UNIT IV SUBSYSTEM DESIGN:

Shifters, Adders-Carry select adder, Carry skip adder, Carry look ahead adder, ALU, Multipliers-Serial- Parallel multiplier, Braun array, Pipelined multiplier, modified Booth's algorithm, Parity generators, Comparators, Counters, High Density Memory Elements

UNIT V VHDL SYNTHESIS:

VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools.

CMOS TESTING: Need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques

Text Books:

1. Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, "Essentials of VLSI circuits and systems", PHI, 2013 Edition.
2. Weste and Eshraghian, "Principles of CMOS VLSI Design", Pearson Education, 2012

Reference Books:

1. Wayne Wolf, "Modern VLSI Design", Pearson Education, 3rd Edition, 2004.
2. John P. Uyemura, "Introduction to VLSI Circuits and Systems", John Wiley, 2003.
3. M.J.Smith,"Application specific Integrated circuits",addisson Wesley 1997

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC51 TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS

(Professional Elective-II)

L	T	P	C
3	-	-	3

Objectives

1. To introduce the concepts of Frequency and Time division multiplexing and digital hierarchy namely SONET / SDH
2. To introduce the concepts of space switching, time switching and combination switching
3. To introduce the need for network synchronization and study synchronization issues. To outline network control and management issues.
4. To study the enhanced local loop systems in digital environment. To introduce ISDN, DSL / ADSL, and fiber optic systems in subscriber loop.
5. To characterize blocking probability holding service time distributions for in speech and data networks.

Outcomes

1. To introduce fundamentals functions of a telecom switching office, namely, digital multiplexing, digital switching and digital subscriber access.
2. To introduce a mathematical model for the analysis of telecommunication traffic.

UNIT I MULTIPLEXING

Transmission Systems, FDM Multiplexing and modulation, Time Division Multiplexing, Digital Transmission and Multiplexing: Pulse Transmission, Line Coding, Binary N-Zero Substitution, Digital Biphase, Differential Encoding, Time Division Multiplexing, Time Division Multiplex Loops and Rings.

SONET/SDH: SONET Multiplexing Overview, SONET Frame Formats, SONET Operations, Administration and Maintenance, Payload Framing and Frequency Justification, Virtual Tributaries, DS3 Payload Mapping, E4 Payload Mapping, SONET Optical Standards, SONET Networks. SONET Rings: Unidirectional Path-Switched Ring, Bidirectional Line-Switched Ring.

UNIT II DIGITAL SWITCHING

Switching Functions, Space Division Switching, Time Division Switching, two-dimensional Switching: STS Switching, TST Switching, No.4 ESS Toll Switch, Digital Cross-Connect Systems, Digital Switching in an Analog Environment. Elements of SSN07 signaling.

UNIT III NETWORK SYNCHRONIZATION CONTROL AND MANAGEMENT

Timing: Timing Recovery: Phase-Locked Loop, Clock Instability, Jitter Measurements, Systematic Jitter. Timing Inaccuracies: Slips, Asynchronous Multiplexing, Network Synchronization, U.S. Network Synchronization, Network Control, Network Management.

UNIT IV DIGITAL SUBSCRIBER ACCESS

ISDN: ISDN Basic Rate Access Architecture, ISDN U Interface, ISDN D Channel Protocol. High-Data-Rate Digital Subscriber Loops: Asymmetric Digital Subscriber Line, VDSL. Digital Loop Carrier Systems: Universal Digital Loop Carrier Systems, Integrated Digital Loop Carrier Systems, Next-Generation Digital Loop Carrier, Fiber in the Loop, Hybrid Fiber Coax Systems, Voice band Modems: PCM Modems, Local Microwave Distribution Service, Digital Satellite Services.

UNIT V TRAFFIC ANALYSIS

Traffic Characterization: Arrival Distributions, Holding Time Distributions, Loss Systems, Network Blocking Probabilities: End-to-End Blocking Probabilities, Overflow Traffic, Delay Systems: Exponential service Times, Constant Service Times, Finite Queues.

Text Book:

1. Bellamy John, “Digital Telephony”, John Wily & Sons, Inc. 3rd edn. 2000.
2. Viswanathan. T., “Telecommunication Switching System and Networks”, Prentice Hall of India Ltd., 1994.
3. Flood J E, “Telecommunications switching, traffic and networks” first Indian reprint, Pearson education Asia, (2001).

Reference Books

1. Bosse J G van, Bosse John G., “Signaling in Telecommunication Networks“ Wiley, John & Sons,(1997).
2. Bruce S. Davie, Paul Doolan, Yakov Rekhtor, “Switching in IP Networks: IP Switching, Tag Switching, and Related Technologies” Elsevier Science & Technology Books, (1998).
3. Joseph Yu Hui, “Switching and Traffic Theory for Integrated Broadband Networks”, Kluwer Academic Publishers, (1990).

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC52	**WIRELESS NETWORKS**	**L**	**T**	**P**	**C**
	(Professional Elective-II)	**3**	**-**	**-**	**3**

Objectives:

1. To understand the basic principles of wireless communication.
2. To provide an overview on practical wireless cellular communication systems.
3. To provide the basic background in wireless data services.
4. To provide the foundation for more advanced courses in related areas.

Outcomes:

On Completion of the Course , the student will be able to understand and gain complete knowledge about

1. Basic wireless, cellular concepts.
2. Mobile Channels.
3. Standards 1G, 2G, 3G Basic system available.
4. GPRS,WATM,Hi-Per LAN

UNIT I MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION:

Introduction, FDMA, TDMA, Spread Spectrum Multiple Access, SDMA, Packet radio, Packet radio protocols, CSMA protocols, Reservation protocols.

INTRODUCTION TO WIRELESS NETWORKING:

Introduction, Difference between wireless and fixed telephone networks, Development of wireless networks(1G,2G and 3G), Traffic routing in wireless networks.

UNIT II WIRELESS DATA SERVICES:

CDPD, ARDIS, RMD, Common Channel Signaling, ISDN, BISDN and ATM, SS7, SS7 user part, signaling traffic in SS7.

MOBILE IP AND WIRELESS ACCESS PROTOCOL:

Mobile IP, Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol.

UNIT III WIRELESS LAN TECHNOLOGY:

Infrared LANs, Spread spectrum LANs, Narrow band microwave LANs, IEEE 802 protocol Architecture, IEEE 802.11 architecture and services, 802.11 medium access control, 802.11 physical layer.

UNIT IV BLUE TOOTH:

Overview, Radio specification, Base band specification, Links manager specification, Logical link control and adaptation protocol, Introduction to WLL Technology.

UNIT V MOBILE DATA NETWORKS:

Introduction, Data oriented CDPD Network, GPRS and higher data rates, Short messaging service in GSM, Mobile application protocol.

WIRELESS ATM & HIPER LAN:

Introduction, Wireless ATM, HIPERLAN, Adhoc Networking and WPAN.

Text Books:

1. Theodore S. Rappaport, Wireless Communications, Principles, Practice, PHI, 2nd Edition, 2009.
2. William Stallings, Wireless Communication and Networking, PHI, 2009.

Reference Books:

1. Kamilo Feher, Wireless Digital Communications, PHI, 1999.
2. Kaveh Pah Laven and P. Krishna Murthy, Principles of Wireless Networks, Pearson Education, 2002.
3. Andreaws F. Molisch, Wireless Communications, Wiley India, 2006.
4. Dharma Prakash Agarwal, Qing-An Zeng, Introduction to Wireless and Mobile Systems, Thomson 2nd Edition, 2006.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC54	**DIGITAL DESIGN THROUGH VERILOG**	**L**	**T**	**P**	**C**
	(Professional Elective-II)	**3**	**-**	**-**	**3**

Objectives:

1. To design a digital circuit using four basic modeling stylesin Verilog HDL
2. To design a combinational logic circuits using Verilog HDL
3. To design a Sequential logic circuits using Verilog HDL
4. To design FPGAs and CPLDs HDL

Outcomes:

On completion of the course the student will be able to understand

1. The basics of Verilog HDL
2. The designing of digital systems using Verilog HDL
3. The design a combinational logic circuits and sequential logic circuits using Verilog HDL
4. The design of FPGAs and CPLDs

UNIT I INTRODUCTION TO VERILOG:

Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools and Test Benches.

LANGUAGE CONSTRUCTS AND CONVENTIONS: Introduction, Keywords, Identifiers, Whitespace Characters, Comments, Numbers, Strings, Logic Values, Data Types, Scalars and Vectors, Parameters, Memory, Operators and System Tasks.

UNIT II GATE LEVEL MODELLING:

Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Tri-state Gates, Array of instances of Primitives, Design of flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types and Design of basic circuits.

SWITCH LEVEL MODELLING: Introduction, Basic Transistor Switches, CMOS Switch, Bidirectional gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Tri-reg nets.

UNIT III BEHAVIORAL MODELLING:

Introduction, Operations and Assignments, Functional Bifurcation, Initial Construct, always Construct, Examples, Assignments with delays, wait

Construct, Multiple always blocks, Designs at Behavioral Level, Blocking and Non-blocking Assignments, case Statement, Simulation Flow, if and if-else Constructs, Assign and De-assign Construct, Repeat Construct, for loop, The Disable Construct, while loop, forever loop, Parallel blocks, force-release Construct and Event.

MODELLING AT DATAFLOW LEVEL: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors and Operators

UNIT IV SYSTEM TASKS, FUNCTIONS AND COMPILER DIRECTIVES: Introduction, Parameters, Path Delays, Module Parameters, System Tasks and Functions, File–Based Tasks and Functions, Compiler Directives and Hierarchical Access.

FUNCTIONS, TASKS, AND USER-DEFINED PRIMITIVES: Introduction, Function, Tasks, User- Defined Primitives (UDP), FSM Design (Moore and Mealy Machines).

UNIT V DIGITAL DESIGN WITH SM CHARTS:

State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice Game, Alternative realizations for SM Charts using Microprogramming and Linked State machines.

DESIGNING WITH FPGAS AND CPLDS: Xilinx 3000 Series FPGAs, Designing with FPGAs, Using a One-Hot State Assignment, Altera Complex Programmable Logic Devices (CPLDs), Altera 7000 and Altera FLEX 10K Series CPLDs.

Text Books:

1. T.R. Padmanabhan and B. Bala Tripura Sundari, “Design through Verilog HDL", WSE, IEEE Press, 2004.
2. Charles H. Roth Jr., “Digital System Design Using VHDL, PWS Publications”, 2nd edition, 2008.

Reference Books:

1. Stephen. Brown and Zvonko Vranesic, “Fundamentals of Logic Design with Verilog”, TMH, 2005.
2. Michael D. Ciletti, “Advanced Digital Design with Verilog HDL”, PHI, 2005.
3. J. Bhasker, “A Verilog Prime”, BSP, 2008.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC55	**MULTIMEDIA COMPRESSION TECHNIQUES**	**L**	**T**	**P**	**C**
	(Professional Elective-II)	**3**	**-**	**-**	**3**

Objectives

The course is designed

1. To provide an introduction to the fundamental principles and techniques in Multimedia Signal coding and compression.
2. To give an overview of current multimedia standards and technologies.
3. To provide techniques related to computer and multimedia networks.
4. To provide knowledge related to Multimedia Network Communications and Applications.

Outcomes

Upon completing the course, the student will be able to:

1. Understand the fundamentals behind multimedia signal processing.
2. Understand the fundamentals behind multimedia compression.
3. Understand the basic principles behind existing multimedia compression and communication standards.

UNIT I Introduction to Multimedia:

Multimedia, World Wide Web, Overview of Multimedia Tools, Multimedia Authoring, Graphics/Image Data Types, and File Formats.

Color in Image and Video: Color Science — Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut Colors, White Point Correction, XYZ to RGB Transform, Transform with Gamma Correction, L*A*B* Color Model. Color Models in Images — RGB Color Model for CRT Displays, Subtractive Color: CMV Color Model, Transformation from RGB to CMV, Under Color Removal: CMYK System, Printer Gamuts, Color Models in Video Video Color Transforms, YUV Color Model, YIQ Color Model, Ycbcr Color Model.

UNIT II Video Concepts:

Types of Video Signals, Analog Video, Digital Video.

Audio Concepts: Digitization of Sound, Quantizatiofl and Transmission of Audio.

UNIT III Compression Algorithms Lossless Compression Algorithms:

Run Length Coding, Variable Length Coding, Arithmetic Coding, Lossless JPEG, Image Compression.

Lossy Image Compression Algorithms: Transform Coding: KLT And DCT Coding, Wavelet Based Coding.

I**mage Compression Standards:** JPEG and JPEG2000.

UNIT IV

Video Compression Techniques: Introduction to Video Compression, Video Compression Based on Motion Compensation, Search for Motion Vectors, H.261- Intra-Frame and Inter-Frame Coding, Quantization, Encoder and Decoder, Overview of MPEG 1 and MPEG2.

UNIT V

Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders — Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoders, MPEG Audio — MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithms, MPEG-2 AAC, MPEG-4 Audio.

Text Books:

1. Fundamentals of Multimedia — Ze- Nian Li, Mark S. Drew, PHI, 2010.
2. Multimedia Signals & Systems — Mrinal Kr. Mandal Springer International Edition 1St Edition, 2009

Reference Books:

1. Multimedia Communication Systems — Techniques, Stds & Netwroks KR. Rao, Zorans. Bojkoric, DragoradA.MjIovanj 1st Edition, 2002.
2. Fundamentals of Multimedia Ze- Man Li, Mark S.Drew, Pearson Education (LPE), 1st Edition, 2009.
3. Multimedia Systems John F. Koegel Bufond Pearson Education (LPE), 1st Edition, 2003.
4. Digital Video Processing — A. Murat Tekaip, PHI, 1996.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC56 COMPUTER COMMUNICATION NETWORKS

(Professional Elective-II)

L	T	P	C
3	-	-	3

Objectives

The objective of the course is to make students to:

1. Understand the basic working of computer networking components.
2. Understand channel allocation problem in medium access control sub layer.
3. Understand design issues of network layer, Routing and Congestion control.
4. Understand the concepts of internet transport protocols (TCP, UDP), DNS, Network security.
5. Understand application layer concepts and issues in network security.

Outcomes

After completing this course the student will be able to:

1. Describe various components and topologies of computer networks
2. Use the network reference model layered structure for real time applications.
3. Implement various routing protocols from different layers.
4. Design, implement and test an efficient algorithmic solution for the give problem.
5. Analyze network security mechanics and other issues in the application layer.

UNIT I

Introduction: Uses of Computer Networks, Network Hardware, Network Topologies, Network Software, References Models. Examples of Networks: Internet, ARPANET, Third Generation Mobile Phone Networks.

The Data Link Layer: Data link Layer Design Issues, Error Detection and Correction, Elementary Data Link Protocols, and Sliding Window Protocols.

UNIT II

The Medium Access Control Sublayer: The Channel allocation Problem, Multiple Access Protocols, Ethernet- Ethernet Cabling, The Ethernet MAC Sublayer Protocol. The Binary Exponential Back off Algorithm, Ethernet Performance, Wireless LANs- the 802.11 Protocol Stack, The 802.11 Physical Layer, The 802.11 MAC Sublayer Protocol, The 802.11 Frame Structure, Broad Band Wireless.

UNIT III

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, the Network Layer in the Internet.

UNIT IV

The Network Layer: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, the Network Layer in the Internet.

UNIT V

The Application Layer: DNS-The Domain Name System, Electronic Mail. The World Wide web, Network Security: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms.

Text Books:

1. Computer Networks, Fifth Edition, Andrew S. Tanenbaum, David J Wetherall Pearson Education,2011.
2. Data Communications and Networking, Fifth Edition, Behrouz A. Forouzan, Tata McGraw Hill.

Reference Books:

1. Computer Communications and Networking Technologies, Michael A. Gallo, William M. Hancock, Cengage Learning.
2. Computer Networking: A Top-Down Approach Featuring the Internet, Six Edition, James F. Kurose, K. W. Ross, Pearson Education,2013.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEE23	**SOFT COMPUTING**	**L**	**T**	**P**	**C**
	(Open Elective-I)	**3**	**-**	**-**	**3**

Objectives:

1. To understand the basic concept of Artificial Neural Networks, its learning strategies and training algorithms.
2. To acquire knowledge about associate memory and training algorithm of various associate memory networks
3. To understand fuzzy logic control system and its applications to electrical drive control systems.
4. To know about the Genetic Algorithm and its applications to electrical power systems

Outcomes:

After completion of the course student will be able to

1. Comprehend the knowledge on various Artificial intelligence techniques like artificial neural networks (ANN), fuzzy logic controller(FLC), genetic algorithm(GA)
2. Analyze various supervised learning techniques and Training algorithms.
3. Design Training algorithms using ANN, Rule base used in fuzzy logic controller Optimum solutions using GA
4. Develop skills in evaluating solutions for power systems and drives using soft computing techniques.

UNIT I ARTIFICIAL NEURAL NETWORKS:

Introduction - Biological Neuron - Artificial Neuron - Basic concepts of Neural Networks - Basic Models of ANN Connections - McCulloch-Pitts Model - Characteristics of ANN - Applications of ANN. Artificial Neuron Model - Operations of Artificial Neuron - Types of Neuron Activation Function - ANN Architectures - Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic),

UNIT II SUPERVISED LEARNING NETWORKS:

Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules - Types of Application Perceptron Network - Perceptron Learning Rule – Architecture - Perceptron Training Algorithm - ADALINE, MADALINE - Back Propagation Network - BP Learning

Rule, Input Layer Computation, Hidden Layer Computation, Output Layer Computation - Radial Basis Function.

UNIT III ASSOCIATIVE MEMORY NETWORK:

Training Algorithms for Pattern Association - Auto Associative Memory Network - Hetero Associative Memory Network – Bidirectional Associate Memory - Hopfield Networks.

UNIT IV CLASSICAL & FUZZY SETS:

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions. Fuzzy Logic System Components**:** Fuzzification - Membership value assignment - Development of rule base and decision making system - Defuzzification to crisp sets - Defuzzification methods.

UNIT V GENETIC ALGORITHMS:

Introduction - Basic Operators and Terminologies in GA - Traditional Vs Genetic Algorithm - Encoding, Fitness Function, Reproduction, Crossover, Mutation Operator.

Text Books:

1. Sivanandam.S.N and Deepa.S.N, Principles of Soft Computing, Wiley India, 2nd Edition, 2007.
2. Rajasekharan and Pai, Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and Applications, PHI Publications, 2nd Edition, 2017.

Reference Books:

1. James A Freeman and Davis Skapura, Neural Networks, Pearson Education, 2002.
2. Solving the unit commitment problem using Fuzzy Logic, Assad Abu-Jasser: International Journal of Computer and Electrical Engineering, Vol. 3, No.6, December 2011.
3. Economic dispatch solution using a Genetic Algorithm based on Arithmetic crossover, T.Yalcinoz, H.Altun and M.Uzam: IEEE Porto Power Tech Conference, 10th – 13th September 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17ACS40	**CLOUD COMPUTING**	**L**	**T**	**P**	**C**
	(Open Elective-I)	**3**	**-**	**-**	**3**

Objectives:

1. The Objective of this course is to make students to
2. To analyse the components of cloud computing and its business perspective.
3. Understand the various services of cloud and to identify various relations in cloud based information systems
4. To collaborate with real time cloud services...
5. Understand various cloud virtualization applications.

Outcomes:

At the end of course student should be able to

1. Use practical cloud applications in daily life.
2. Apply various cloud services in real time applications.
3. Collaborate with different practical web applications for business management.
4. Differentiate cloud security services and standards.

UNIT I CLOUD

INTRODUCTION

Meaning of the terms cloud and cloud computing, cloud based service offerings, Grid computing vs Cloud computing, Benefits of cloud model, limitations, legal issues, Key characteristics of cloud computing, Challenges for the cloud, The evolution of cloud computing.

UNIT II WEB SERVICES DELIVERED FROM THE CLOUD

Infrastructure-as-a-service, Platform-as-a-service, Software-as-a-service. Building Cloud networks: Evolution from the MSP model to cloud computing and software -as-a-service, The cloud data center, SOA as step toward cloud computing, Basic approach to a data center based SOA.

UNIT III CLOUD SERVICES

Collaborating on calendars, Schedules, and Task Management, Exploring online scheduling applications, Exploring online planning and task management. Collaborating on Word

Processing, Storing and sharing files and Other Online Content. Exploring Online Photo-Editing Applications.

UNIT IV VIRTUALIZATION

History of virtualization, objectives of virtualization, benefits of virtualized technology, Virtualization Technologies:VMware, Microsoft Hyper-V, Virtual Iron, Xen, Ubuntu (Server Edition), Software Virtualization, Para Virtualization, OS Virtualization, Oracle Virtualization, Storage Virtualization Technologies, Virtualization and Storage Management.

UNIT V CLOUD SECURITY

Cloud security challenges, Software-as-a-service security.Common Standards in Cloud computing: The open cloud consortium, The distributed management task force, standards for application developers, standards for messaging, standards for security.

Text Books:

1. "Cloud Computing implementation, management and security", John W. Ritting house, James F. Ransome ,CRC Press, Taylor &Francis group, 2010.
2. "Cloud Computing Virtualization Specialist Complete Certification Kit - Study Guide Book", Ivanka Menken and Gerard Blokdi j k, , EmereoPvt Ltd, April 2009.

Reference Books:

1. Michael Miller, Cloud Computing: Web-Based Applications That Change the Way YouWork and Collaborate Online, Que Publishing, August 2008
2. Cloud Application Architectures Building Applications and Infrastructure in the Cloud, George Reese, and O'Reilly Media Released, April 2009.
3. Cloud Computing and SOA convergence in your enterprise", David S. Linthicum, Addison- Wesley,2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17ACS41	**NETWORK SECURITY ESSENTIALS**	**L**	**T**	**P**	**C**
	(Open Elective-I)	**3**	**-**	**-**	**3**

Objective

The objective of this course is to make students to:

1. Understand information security's importance in our increasingly computer-driven world.
2. Understand various security attacks and security service.
3. Understand various security policies (such as authentication, integrity and confidentiality), as well as protocols to implement such policies in form of message exchanges.
4. Understand basic information security principles and approaches.
5. Understand the different versions of SNMP protocols

Outcomes:

At the end of this course, students will be able to:

1. Demonstrate conventional Encryption Principles and algorithms.
2. Evaluate the performance of cryptography algorithms.
3. Develop an Intrusion Detection Systems using appropriate modern tool.
4. Analyze the major information security threats and countermeasures.
5. Compare the performance of a network using SNMP protocol.

UNIT I SECURITY ATTACKS:

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

UNIT II

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC. Public key cryptography principles,

public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

UNIT III EMAIL PRIVACY:

Pretty Good Privacy (PGP) and S/MIME.IP Security Overview, IP Security Architecture, Authentication Header, Combining Security Associations and Key Management.

UNIT IV

Web Security Requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT V

Basic concepts of SNMP, SNMPv1 Community facility and SNMPv3.Intruders, Viruses and related threats, Firewall Design principles.

Text Books:

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

Reference Books:

1. Fundamentals of Network Security, Eric Maiwald. Dreamtech press.
2. Network Security - Private Communication in a Public World, Charliekaufman, Radia Perlman and Mik, Speciner, Pearson/PHI.
3. Cryptography and network Security, Stallings, Third edition, PHI/Pearson.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEE39	**INDUSTRIAL ELECTRONICS**	**L**	**T**	**P**	**C**
	(Open Elective-I)	**3**	**-**	**-**	**3**

Objectives:

1. To Understand the different types of power semiconductor devices and their switching characteristics
2. To understand the operation and performance parameters of controlled rectifiers, DC-DC Converters, AC voltage regulators and Cycloconverters
3. To learn the operation and control of solid state DC Drives, Induction motor and synchronous motor

Outcomes:

After completion of the course a successful student will be able to

1. Demonstrate knowledge on
   - Switching characteristics of power Electronics Switches
   - Operation of rectifier, choppers, AC voltage regulators, Cycloconverters and Inverters
   - Operation and speed control of various DC and AC drives in open loop.
2. Analyze single and multi-quadrant operations of DC and AC drives with speed – torque characteristics.

UNIT I POWER DEVICES:

Power diode–Power transistor–Power MOSFET–SCR–TRIAC–GTO–IGBT–MCT–Protection of power devices.

UNIT II SINGLE AND THREE PHASE RECTIFIERS:

Introduction to half wave, full wave and bridge rectifiers–Single phase and three phase–Half controlled and fully controlled converters–Dual converters. Single Phase step up and step down cycloconverters and Single-Phase AC voltage controllers

UNIT III CHOPPERS AND INVERTERS:

Choppers–.Step up and step down choppers–Chopper classification–Class A, B, C, D, E–AC choppers–Voltage Source Inverter (VSI)–Bridge inverters–Single phase bridge inverter

and three phase bridge inverter (180°and 120°mode)–Voltage control using PWM–Current Source Inverter(CSI)

UNIT IV DC DRIVES:

Single Phase and three phase half and Fully controlled converters connected to DC separately excited– continuous motor current operation – output voltage and current waveforms – Speed-Torque Characteristics. Control of DC separately excited motor by one, two and four quadrant choppers – voltage and current waveforms for continuous motor currents- Closed loop control scheme

UNIT V AC DRIVES:

Speed-torque characteristic of induction motor–Static stator voltage control–Variable frequency control of induction motor by Voltage source ,current source inverter and Cycloconverters –Static rotor resistance control–Slip power recovery scheme–Self control of synchronous motor.

Text Books:

1. G.K.Mithal, Industrial Electronics, Khanna Publishers, Delhi, 1st Edition, 2000.
2. M.H.Rashid, Power Electronics Circuits Devices and Application, PHI, 3rd Edition, 2004.

Reference Books:

1. G.M.Chuteand and R.D.Chute, Electronics in Industry, McGraw Hill Ltd, Tokyo, 1st Edition, 1995.
2. F.D.Petruzulla, Industrial Electronics, McGraw Hill, Singapore, 1st Edition, 1996.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AME40	**ROBOTICS**	**L**	**T**	**P**	**C**
	(Common to CSE, EEE & AE)	**3**	**-**	**-**	**3**
	(Open Elective-I)				

Objectives:

1. To learn about the basic concepts of robots.
2. To comprehend the various robot drives and power transmission systems.
3. To encapsulate the fundamentals of robot sensors and its vision system.
4. To understand the concepts of arm kinematics and Programming Languages and to study the applications of robot in various fields.

Outcomes:

After completion of the course, the student will be able to:

1. Describe the basic concepts of robotics.
2. Summarize the perception about robot components and programme in industry.
3. Select the type of robot eco-friendly for typical manufacturing industry and service sector.
4. Choose a program that the robot can integrate with the manufacturing system to produce quality products with minimum cost with optimum usage of resources.

UNIT I INTRODUCTION TO ROBOTICS:

Automation versus Robotic technology, Laws of robot, Progressive advancements in Robots, Robot Anatomy, Classification of robots-coordinate method, control method; Specification of robots.

End Effectors: Classification of End effectors – Tools as end effectors, Mechanical-adhesive-vacuum-magnetic-grippers.

UNIT II ROBOT ACTUATORS AND MOTION CONVERSION SYSTEMS:

Robot Actuators- hydraulic and pneumatic actuators- block diagram, types, values-flow and pressure control values, applications, limitations. Electric actuators-Stepper motor, servo motor-principle of working. Comparison among hydraulic, pneumatic & Electric actuators.

Motion Conversion: Rotary-to-Rotary motion conversion- Gears, Harmonic Drives, Belt-and- pulley systems, Rotary-to-Linear motion conversion- Lead screws, Rack and Pinion systems, cams.

UNIT III ROBOTIC SENSORS:

Meaning of sensing, selection of sensor for a robot, types of sensors -Position sensors, range sensors, velocity sensors, touch sensors, force and torque sensors.

ROBOT VISION- Block diagram of vision system, lighting techniques and devices, analog to digital conversion, Image storage, Image processing and Analysis, Object recognition, Feature extraction.

UNIT IV ROBOT ARM KINEMATICS:

Homogeneous transformations, Basics of forward kinematics, Inverse kinematics, Basics of Trajectory Planning.

ROBOT PROGRAMMING: Requirements of good programming language, Types of Robot programming, Robot programming languages and features- AL, AML, RPL, and VAL.

UNIT V ROBOTIC APPLICATIONS:

Present applications-Material Transfer, Material handling, loading and unloading, processing, welding, spray painting, Assembly and Inspection; Future applications.

Text Books

1. M.P. Groover, Industrial Robotics, New Delhi, Tata McGraw Hill, 2008.
2. R.K. Mittal & I.J.Nagrath, Robotics and Control, New Delhi, 3rd Edition, Tata McGraw Hill, 2007.

References:

1. Ganesh S. Hegde, Industrial Robotics, Lakshmi Publications (P), LTD
2. Richard D.Klafter, Robotics Engineering, Bangalore, New Delhi, Prentice Hall, Eastern Economy Edition, 1989.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC33	**DIGITAL SIGNAL PROCESSING LAB**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

To enable the students to

1. Understand circular convolution, its relationship to linear convolution.
2. Understand the FFT algorithm for efficient computation of the DFT.
3. Use the Fast Fourier Transform algorithm in a variety of applications.
4. Design digital FIR filters using the window method.
5. Design digital IIR filters by designing prototype analog filters.

Outcomes:

On completion of the lab the student will be able to

1. Perform Circular convolution and linear convolution.
2. Apply FFT algorithm for efficient computation of the DFT and IDFT.
3. Apply the FFT algorithm to compute power density spectrum of a sequence.
4. Design digital FIR filters using the window method.
5. Design digital IIR filters by using Butterworth and Chebyshev methods.

LIST OF EXPERIMENTS

Minimum of 6 experiments are to be conducted from each part

Part A (Experiments using MATLAB)

1. Generation of different waveforms and different time sequences.
2. Linear and Circular Convolutions in time domain and frequency domain.
3. Spectrum analysis using DFT.
4. Frequency response of different analog filters.
5. Design FIR Low Pass Filter using different window techniques.
6. Design Butterworth and Chebyshev filters (Low Pass and High Pass)
7. Interpolation and Decimation of sequence.

Part B (Experiments using CC Studio)

1. Linear Convolution
2. Circular Convolution.
3. N-point FFT algorithm.
4. Auto Correlation and Cross Correlation.
5. Density spectrum of 1- D Signal.
6. Implementation of FIR Filter.
7. Implementation of IIR Filter.
8. Study of TMS320C6713.
9. Arithmetic operations using TMS320C6713.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC35 MICROPROCESSORS AND MICROCONTROLLERS LAB

(Common to ECE & EEE)	**L**	**T**	**P**	**C**
	-	**-**	**3**	**1.5**

Objectives:

The course will provide the student:

1. To become skilled in 8086 Assembly Language Programming.
2. To understand different applications of 8086 Microprocessor.
3. To use microprocessor for any type of waveform generation including pattern generation.
4. To learn 8051 Microcontroller Assembly Language Programming.
5. To learn about built-in timer of 8051 Microcontroller.

Outcomes:

At the end of the course student will be

1. Able to write 8086 Assembly Language Programs.
2. Able to use 8086 Microprocessor for any application.
3. Able to generate any type of waveforms.
4. Able to write 8051 Assembly Language Programs.
5. Able to use built-in timer of 8051 Microcontroller.

List of Experiments

(Minimum 12 Experiments to be conducted)

PART A: 8086 Microprocessor Programs using MASM/TASM Software.

(Minimum 9 Experiments to be conducted)

By using Arithmetic & Logical instructions:

1. ALPs (8086) for addition and subtraction.
2. ALPs (8086) for multiplication and Division.
3. ALPs (8086) to determine GCD and LCM of two 16-bit numbers.
4. ALPs (8086) to evaluate arithmetic expressions.
5. ALPs (8086) for sorting and searching.
6. Logic operations-Shift and rotate, converting packed BCD to unpacked BCD, BCD to ASCII conversion.

By using String Instructions:

7. String operations-Move block, Reverse string, String comparison, Length of string.

Interfacing Programs using 8086:

8. ALPs (8086) for generating ramp wave, triangular wave, and stair case wave forms using DAC.
9. ALP (8086) for traffic light controller.
10. ALP (8086) for stepper motor control.

PART B: 8051 Microcontroller.

(Minimum 3 Experiments to be conducted)

1. (a) ALP (8051) to determine the largest of N bytes.
   (b) ALP (8051) to determine the smallest of N bytes.
2. (a) ALP (8051) to multiply a 16-bit number by an 8-bit number.
   (b) ALP (8051) to find square root of an 8-bit number.
3. (a) ALP (8051) to determine LCM of two 8- bit numbers.
   (b) ALP (8051) to determine GCD of two 8- bit numbers.
4. (a) ALP (8051) to generate even numbers.
   (b) ALP (8051) to generate odd numbers.
5. Timer/Counters (8051) in different modes.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code:17AEC36	**VLSI Lab**	**L**	**T**	**P**	**C**
		-	**-**	**3**	**1.5**

Objectives:

1. To design and verify the functionality of various digital circuits
2. To synthesize and to verify the timing analysis.
3. To generate RTL Schematic and synthesis report.

Outcomes:

1. Know the various design methodologies of digital circuits
2. Know the importance of simulation and synthesis

List of Experiments

Minimum 10 Experiments to be conducted

Digital Circuits description using Verilog HDL

1. Design of half adder.
2. Design of Full adder
3. Design of 8-bit Carry select adders
4. Design of 8-bit Carry look ahead adder
5. Design of 8x1 Multiplexer
6. Design of 3 to 8 Decoder
7. Design of Array Multiplier
8. Design of Comparator
9. Design of 8-bit shift register
10. Design of Ripple counter
11. Design of Parity generator
12. Design of ALU

Note: Required software tools

i) Model Sim-Simulation

ii) Xilinx -Synthesis

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC37	**COMPREHENSIVE ONLINE EXAMINATION**	**L**	**T**	**P**	**C**
		-	**-**	**-**	**0.5**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech II Semester ECE

Code: 17AEC81 MOOC- II

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC38	**EMBEDDED SYSTEMS**	**L**	**T**	**P**	**C**
	(Common to ECE & EEE)	**3**	**1**	**-**	**3**

Objectives

The course will provide the student:

1. To know the fundamental concepts of embedded systems.
2. To study state machine models and concurrent process models.
3. To study processor peripherals and communication interfaces.
4. To learn the kernel, RTOS.

Outcomes

On completion of the course the student will

1. Understand the fundamental concepts of Embedded systems.
2. Know the state machine models and concurrent process models.
3. Know the watch dog timer, real time clock and communication interfaces.
4. Understand the RTOS and Kernel.
5. Understand the hardware and software design.

UNIT I INTRODUCTION TO ASIP & DSP PROCESSORS:

Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Custom Single purpose processors- RT-level combinational logic, sequential logic (RT-level), custom single purpose processor design (RT-level), optimizing custom single purpose processors. General Purpose Processors - Basic architecture, operation- Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT II STATE MACHINE AND CONCURRENT PROCESS MODELS:

Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT III STANDARD SINGLE PURPOSE PROCESSORS: PERIPHERALS:

Timers, counters and watch dog timers, real time clock. Communication Interface - Need for communication interfaces, RS232 / UART, RS422/ RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT IV

EMBEDDED / RTOS CONCEPTS: Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex. Mailboxes, Message Queues, Event Registers, Pipes, Signals, Timers, Memory Management, Priority inversion problem, Embedded operating systems- Embedded Linux, Real-time operating systems- RT Linux, Handheld operating systems- Windows CE.

UNIT V DESIGN TECHNOLOGY:

Introduction, Automation, synthesis, parallel evolution of compilation & synthesis, logic synthesis, RT synthesis, Behavioral synthesis, system synthesis & Hardware/software Co-design, verification, Hardware/software co-simulation, Reuse of intellectual property codes.

Text Books:

1. Frank Vahid, Tony D. Givargis, "Embedded System Design – A Unified Hardware/Software Introduction", John Wiley, 2002.
2. KVKK Prasad, "Embedded / Real Time Systems", Dreamtech Press, 2005.

Reference Books:

1. Jonathan W. Valvano, Brooks / Cole, "Embedded Microcomputer Systems", Thompson Learning.
2. David E. Simon, "An Embedded Software Primer", Pearson Ed., 2005.
3. Raj Kamal, "Introduction to Embedded Systems", TMS, 2002.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code:17AEC39	**OPTICAL COMMUNICATIONS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives

The course will provide the student:

1. To learn the basic elements of optical fiber transmission link, fiber modes, configurations and structures.
2. To introduce different kind of losses, signal distortion factors in optical fibers.
3. To understand optical sources with coupling techniques and learn about various components.
4. To enlighten the student with optical signal detection process and to gain knowledge on receiver noises.
5. To learn optical amplification, operational principles of WDM and introduction to optical networks.

Outcomes

On completion of the course the student will be able to:

1. Recall basic laws of optical physics, recognize and classify the structures of Optical fibers and types.
2. Identify the various causes for signal degradation.
3. Categorize the types of sources of light on basis of physical construction and principle of operation.
4. Enable to decide correct detectors for optical receiver design.
5. Discuss the type of optical amplifiers and wavelength converters and look into the widely used networks like SONET/SDH

UNIT I INTRODUCTION:

Historical development, Elements of an Optical Fiber Transmission link, Advantages of optical fiber communication, Ray optics, Optical Fiber Modes and Configurations , Mode theory of Circular Wave guides- Overview of Modes-Key Modal concepts, Graded Index fiber structure, Single-mode fibers-Mode Field Diameter, cutoff wavelength, effective refractive index, mode coupling, Fiber materials, Fiber fabrication.

UNIT II SIGNAL DEGRADATION IN OPTICAL FIBERS:

Attenuation-units, Material absorption losses, scattering losses, Fiber bend loss, Core and Cladding losses, Signal Distortion in Optical Wave guides - Information Capacity determination, Group Delay, Material Dispersion, Wave guide Dispersion, Signal distortion in SM fibers, Polarization Mode dispersion, Intermodal dispersion, Design Optimization of SM fibers-RI profile and cut-off wavelength.

UNIT III OPTICAL SOURCES AND COUPLING:

Introduction, The light emitting diode - LED power and efficiency, LED structures, LED characteristics, The laser – Introduction, Basic concepts, Optical emission from semiconductors, The semiconductor injection laser, Injection laser structures, Single-frequency injection lasers. source-to-fiber Power Launching, Lensing schemes, Fiber –to-Fiber joints, Fiber splicing-splicing techniques, Optical Fiber Connectors.

UNIT IV OPTICAL DETECTORS AND RECEIVERS:

Introduction, Device types, Optical detection principles, Absorption, Quantum efficiency, Responsivity, Long-wavelength cutoff, Semiconductor photodiodes without internal gain, Semiconductor photodiodes with internal gain. Direct detection receiver performance considerations – Introduction, Noise, Receiver noise, shot noise, Receiver sensitivity.

UNIT V OPTICAL AMPLIFICATION, OPTICAL NETWORKS:

Introduction, Optical amplifiers, Semiconductor optical amplifiers, Erbium doped fiber amplifiers, operation principles of WDM.

OPTICAL NETWORKS: Network topologies, SONET/SDH- Transmission formats and speeds, optical interfaces, SONET/SDH Rings, SONET/SDH Networks.

Text Books:

1. GerdKeiser,“Optical Fiber Communication”, McGraw– Hill International, Singapore, 5th edition 2013.
2. John M. Senior,“Optical Communication, Principles and Practice”, PHI , 3rd edition 2009.

Reference Books:

1. Max Ming-Kang Liu, “Principles and Applications of Optical Communications”, TMH, 2010.
2. Djafar K. Mynbaev, Lowell L. Scheiner, "Fiber-Optic Communications Technology", 1st edition, Pearson Education, 2001

3. S.C.Gupta, “Text book on optical fiber communication and its applications”, PHI,2005.
4. Satish Kumar, “Fundamentals of Optical Fiber communications”, PHI, 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC40	**RADAR SYSTEMS**	**L**	**T**	**P**	**C**
		3	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To understand the components of a radar system and their relationship to overall system performance
2. To become familiar with design, operation, and applications of various types of radar systems.
3. To apply Doppler principle to radars and hence detect moving targets, clutter, also to understand tracking radars.
4. To understand and learn the principle of target track and various types of radar antennas.

Outcomes:

On completion of the course the student will be able to:

1. To become familiar with fundamentals of radar.
2. To gain knowledge about different types of radars and their operation.
3. Know the need for signal detection in radar and various radar signal detection techniques.
4. know how radar detects Doppler Frequency hence velocity of target

UNIT I BASICS OF RADAR:

Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications, Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

RADAR EQUATION:

SNR, Envelope Detector, False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (simple targets -sphere, cone-sphere),

Transmitter Power, PRF and Range Ambiguities, System Losses (qualitative treatment), Illustrative Problems.

UNIT II CW RADAR:

Doppler Effect, CW Radar –Block Diagram, Isolation between Transmitter and Receiver, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar, Illustrative Problems.

FM-CW RADAR:

Introduction, Range and Doppler Measurement, Block Diagram and Characteristics (Approaching/ Receding Targets), FM-CW altimeter, Multiple Frequency CW Radar.

UNIT III MTI AND PULSE DOPPLER RADAR:

Introduction, Principle, MTI Radar with -Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers –Filter Characteristics, Blind Speeds, Double Cancellation, and Staggered PRFs. Range Gated Doppler Filters, MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler radar.

UNIT IV TRACKING RADAR:

Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar – Amplitude Comparison Monopulse (one-and two-coordinates), Phase Comparison Monopulse, Tracking in Range, Acquisition and Scanning Patterns, Comparison of Trackers.

UNIT V DETECTION OF RADAR SIGNALS IN NOISE:

Introduction, Matched Filter Receiver –Response Characteristics and Derivation, Correlation Function and Cross-correlation Receiver, Efficiency of Non-matched Filters, Matched Filter with Non-white Noise.

RADAR RECEIVERS:

Noise Figure and Noise Temperature, Displays–types. Duplexers–Branch type and Balanced type, Circulator as Duplexer. Introduction to Phased Array Antennas –Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Series versus Parallel Feeds, Applications, Advantages and Limitations.

Text Books:

1. Merrill I. Skolnik, Introduction to RADAR Systems, TMH Special Indian Edition, 2nd Edition, 2004.

Reference Books:

1. Merrill I. Skolnik, Introduction to RADAR Systems, 3rd Edition, Tata McGraw- Hill, 2010.
2. Byron Edde, RADAR Principles, Technology and Applications, Pearson Education, 2004.
3. Peebles Jr.P.Z, RADAR Principles, Wiley, NewYork, 2006.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC57	**RF SYSTEM DESIGN**	**L**	**T**	**P**	**C**
	(Professional Elective-III)	**3**	**1**	**-**	**3**

Objectives:

To familiarize the student:

1. With various filter realizations.
2. With construction and functionality of BJT, FET and HEMT.
3. With various matching and biasing networks.
4. With design of RF transistor amplifier, Oscillator and Mixer circuits.

Outcomes:

After the completion of the course, the student will be able to:

1. Understand various filter realizations.
2. Understand construction and functionality of BJT, FET and HEMT.
3. Analyze various matching and biasing networks.
4. Design RF transistor amplifier, Oscillator and Mixer circuits.

UNIT – I AN OVERVIEW OF RF FILTER DESIGN:

Basic Resonator & Filter configurations, Special filter realizations: Butterworth type and Chebyshev type, Filter implementation and Coupled filters.

UNIT-II ACTIVE RF COMPONENTS AND ITS MODELING:

Bipolar Junction Transistors, RF Field Effect Transistors and High Electron Mobility Transistors: Construction, Functionality, Frequency response and Temperature behavior.

Transistor Model: Large signal and Small signal model of BJT and FET.

UNIT-III MATCHING AND BIASING NETWORKS:

Impedance Matching using discrete components, Microstripline matching networks, Amplifier classes of operation and Biasing networks.

UNIT-IV RF TRANSISTOR AMPLIFIER DESIGN:

Characteristics of amplifiers, Amplifier power relations, Stability considerations, Constant gain, Broad-band, High power and Multi stage amplifiers.

UNIT-V OSCILLATORS AND MIXERS:

Basic oscillator model, Dielectric resonator oscillator, YIG Tuned oscillator and Voltage Controlled Oscillator. Characteristics of Mixers: Basic concepts, Frequency domain considerations, Single ended mixer design, Single balanced mixer and Double balanced mixer.

Text Books:

1. Reinhold Ludwig & Pavel Bretchko, "RF Circuit Design, Theory and Applications", Prentice Hall, 2002.
2. Mathew M. Radmanesh, "Radio Frequency and Microwave Electronics Illustrated", Pearson Higher Education, First Edition, 2009.

Reference Books:

1. Thomas H. Lee "The Design of CMOS Radio-Frequency Integrated Circuits" Second Edition, Cambridge University press, 2008.
2. B.Razavi, "RF Microelectronics", Second Edition, Prentice Hall, 2011.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC59 MICROWAVE INTEGRATED CIRCUIT DESIGN
(Professional Elective-III)

L	T	P	C
3	1	-	3

Objectives:

To familiarize the student:

1. With basic concepts and techniques of microwave integrated circuits.
2. With construction and functionality of BJT, FET and HEMT.
3. To design and analysis of active devices, non – reciprocal components.
4. To design lumped elements using microwave amplifiers.

Outcomes:

After the completion of the course, the student will be able to:

1. Acquire knowledge about microwave integrated circuits.
2. Gain knowledge of planar transmission line for MIC.
3. Gain knowledge and understanding of lumped elements for MIC, Microwave semiconductor Devices
4. Develop understanding of the fundamentals required to design and implement integrated Circuits operating at microwave frequencies.

UNIT I

Introduction TO Monolithic Microwave Integrated Circuits (MMICs), their advantages over discrete circuits, materials, MMIC fabrication techniques, MOSFET fabrication. Thin film formation.

UNIT II

Planar transmission lines for MICs, Method of conformal transformation for microstrip analysis, concept of effective dielectric constant, effective dielectric constant for microstrip, losses in microstrip.

UNIT III

Slot line approximate analysis and field distribution, transverse resonance method and evaluation of slot line impedance, comparison with microstrip line.

UNIT IV LUMPED ELEMENTS FOR MICS:

Use of lumped elements, Capacitive elements, inductive elements and resistive elements

UNIT V MICROWAVE SEMICONDUCTOR DEVICES & MICROWAVE PASSIVE COMPONENTS:

Parametric amplifiers, tunnel diode, varactor diode, PIN diode, Gunn diode, their principle of operation, performance characteristics & applications, scattering parameter calculations of E-Plane Tee, Magic Tee, Directional coupler.

Text Books:

1. Microwave Integrated circuits ,K.C. Gupta.
2. Microwave integrated circuits, by Yoshihiro Konishi.

Reference Books:

1. Thomas H. Lee “Planar Microwave Engineering” , Cambridge University press, 2004.
2. Matthew M. Radmanesh,”, “Radio Frequency and Microwave Electronics”, pearson education.
3. Ravender Goyal, “Monolithic MIC; Technology & Design”, Artech House,1989

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC60	**ELECTRO MAGNETIC INTERFERENCE AND COMPATIBILITY (Professional Elective-III)**	**L**	**T**	**P**	**C**
		3	**1**	**–**	**3**

Objectives

1. To understand EMI Sources, EMI problems and their solution methods in PCB level /Subsystem and system level design.
2. To measure the emission and immunity level from different systems to couple with the prescribed EMC standards

Outcomes:

Upon completion of the course, students will be able to:

1. Find solution to EMI problems in PCB level / Subsystem and system level design.
2. To measure emission immunity level from different systems to couple with the prescribed EMC standards.
3. To familiarise to test the different characteristics of Electro Magnetic Interference.

UNIT I BASIC THEORY

Introduction to EMI and EMC, Intra and inter system EMI, Elements of Interference, Sources and Victims of EMI, Conducted and Radiated EMI emission and susceptibility, Case Histories, Radiation hazards to humans, Various issues of EMC, EMC Testing categories, EMC Engineering Application.

UNIT II COUPLING MECHANISM

Electromagnetic field sources and Coupling paths, Coupling via the supply network, Common mode coupling, Differential mode coupling, Impedance coupling, Inductive and Capacitive coupling, Radiative coupling, Ground loop coupling, Cable related emissions and coupling, Transient sources, Automotive transients.

UNIT III EMI MITIGATION TECHNIQUES

Working principle of Shielding and Murphy's Law, LF Magnetic shielding, Apertures and shielding effectiveness, Choice of Materials for H, E, and free space fields, Gasketting and

sealing, PCB Level shielding, Principle of Grounding, Isolated grounds, Grounding strategies for Large systems, Grounding for mixed signal systems, Filter types and operation, Surge protection devices, Transient protection.

UNIT IV STANDARDS AND REGULATION

Need for Standards, Generic/General Standards for Residential and Industrial environment, Basic Standards, Product Standards, National and International EMI Standardizing Organizations; IEC, ANSI, FCC, AS/NZS, CISPR, BSI, CENELEC, ACEC. Electro Magnetic Emission and susceptibility standards and specifications, MIL461E Standards.

UNIT V EMI TEST METHODS AND INSTRUMENTATION

Fundamental considerations, EMI Shielding effectiveness tests, Open field test, TEM cell for immunity test, Shielded chamber , Shielded anechoic chamber, EMI test receivers, Spectrum analyser, EMI test wave simulators, EMI coupling networks, Line impedance stabilization networks, Feed through capacitors, Antennas, Current probes, MIL -STD test methods, Civilian STD test methods.

Text Books:

1. Prasad Kodali.V,"Engineering Electromagnetic Compatibility", S.Chand&Co, NewDelhi, 2000.
2. Clayton R.Paul,"Introduction to Electromagnetic compatibility", John Wiley & Sons, 1992.
3. Henry W. Ott, "Electromagnetic Compatibility Engineering", John Wiley & Sons Inc, Newyork, 2009.

Reference Books:

1. Kenneth L Kaiser, "The Electromagnetic Compatibility Handbook", CRC Press 2005.
2. Daryl Gerke and William Kimmel, "EDN's Designer's Guide to Electromagnetic Compatibility", Elsevier Science & Technology Books, 2002
3. W Scott Bennett, "Control and Measurement of Unintentional Electromagnetic Radiation", John Wiley & Sons Inc., (Wiley Interscience Series) 1997.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC45	**DIGITAL IMAGE PROCESSING**	**L**	**T**	**P**	**C**
	(Professional Elective-III)	**3**	**1**	**-**	**3**

Objective:

1. To learn the fundamentals of Image Processing.
2. To learn sampling and reconstruction procedures.
3. To learn the various transforms used in image Processing.
4. To study various concepts of image enhancement, reconstruction and image compression.

Outcome:

On completion of the course the students will be able to

1. Identify, formulate &solve problems involving images.
2. Design &conduct experiments, analyze &interpret image data.
3. Demonstrate the skills to use modern engineering tools, softwares & equipment to analyze problems.
4. Show the ability to participate &try to succeed in competitive Exams.

UNIT I DIGITAL IMAGE FUNDAMENTALS

Digital Image representation – Digital image processing System –Visual Perception-Sampling and Quantization - Basic relationships between pixels, and imaging geometry.

UNIT II IMAGE TRANSFORMS

Discrete Fourier Transform – Properties of 2 – D Fourier Transform – Fast Fourier Transform, Walsh, Hadamard, Discrete cosine transforms.

UNIT III IMAGE ENHANCEMENT

Background enhancement by point processing Histogram processing, Spatial filtering, Enhancement in frequency Domain, Image smoothing, Image sharpening, Colour images

Image Restoration: Degradation model, Algebraic approach to restoration – Inverse filtering – Least Mean Square filters, Constrained Least square restoration.

UNIT IV IMAGE CODING

Fidelity criteria, Encoding process, transform encoding.

UNIT V IMAGE SEGMENTATION

Detection and discontinuities, Edge linking and Boundary detection, Boundary description.

Text Books:

1. R. C .Gonzalez & R.E. Woods, "Digital Image Processing", Addison Wesley/Pearson education, 3rd Edition, 2010.
2. A .K. Jain, "Fundamentals of Digital Image processing", PHI.

Reference Books:

1. Rafael C. Gonzalez, Richard E woods and Steven L.Eddins, "Digital Image processing using MATLAB", Tata McGraw Hill, 2010.
2. S Jayaraman, S Esakkirajan, T Veerakumar, "Digital Image processing",Tata McGraw Hill
3. William K. Pratt, "Digital Image Processing", John Wilely, 3rd Edition, 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC61	**ADHOC NETWORKS**	**L**	**T**	**P**	**C**
	(Professional Elective-III)	**3**	**1**	**-**	**3**

Objectives:

The course will provide the student:

1. To know about Ad-Hoc Wireless Networks, Issues, Classification of MAC Protocols.
2. To understand the Different types of AdHoc Routing Protocols and TCP over AdHoc Protocol.
3. To know about Sensor Network Architecture, its Applications and MAC Protocols for sensor networks.
4. To know about Different Issues in Wireless Sensor Routing. It also covers Indoor and outdoor Localization and Quality of Service in WSN.

Outcomes:

After the completion of the course, the student will be able to:

1. Understand about Ad-Hoc Wireless Networks, Issues, and Classification of MAC Protocols.
2. Understand the Different types of AdHoc Routing Protocols and TCP over AdHoc Protocol.
3. Understand the Sensor Network Architecture, its Applications and MAC Protocols for sensor networks.
4. Understand the Different Issues in Wireless Sensor Routing. It also covers Indoor and outdoor Localization and Quality of Service in WSN.

UNIT I AD-HOC MAC

Introduction – Issues in Ad-Hoc Wireless Networks. MAC Protocols – Issues, Classifications of MAC protocols, Multi channel MAC & Power control MAC protocol.

UNIT II AD-HOC NETWORK ROUTING & TCP

Issues – Classifications of routing protocols – Hierarchical and Power aware. Multicast routing – Classifications, Tree based, Mesh based, Ad Hoc Transport Layer Issues, TCP Over Ad Hoc – Feedback based, TCP with explicit link, TCP-Bus, Ad Hoc TCP, and Split TCP.

UNIT III WSN –MAC

Introduction – Sensor Network Architecture, Data dissemination, Gathering, MAC Protocols – self-organizing, Hybrid TDMA/FDMA and CSMA based MAC.

UNIT IV WSN ROUTING, LOCALIZATION & QoS

Issues in WSN routing – OLSR, AODV. Localization – Indoor and Sensor Network Localization, QoS in WSN.

UNIT V MESH NETWORKS

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – opportunistic routing – Self configuration and Auto configuration – Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks.

Text Books:

1. C.Siva Ram Murthy and B.Smanoj, " Ad Hoc Wireless Networks – Architectures and Protocols", Pearson Education, 2004.
2. Feng Zhao and Leonidas Guibas, "Wireless Sensor Networks", Morgan Kaufman Publishers, 2004.

Reference Books:

1. C.K.Toh, "Ad Hoc Mobile Wireless Networks", Pearson Education, 2002.
2. Thomas Krag and Sebastin Buettrich, "Wireless Mesh Networking", O'Reilly Publishers, 2007.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC53	**SATELLITE COMMUNICATIONS**	**L**	**T**	**P**	**C**
	(Professional Elective-IV)	**3**	**-**	**-**	**3**

Objectives:

1. To introduce the basic principles of Satellite Communication systems, orbital mechanics, launchers.
2. To introduce the basic concepts and designing of Satellite links.
3. To introduce the basic concepts of earth station transceiver.
4. To know the basic concepts of various multiple access techniques and GPS systems.

Outcomes:

On completion of the course the students will be able to

1. Determine the location of Satellite.
2. Design satellite uplink and downlink.
3. Design earth station transmitter, receiver and antenna systems.
4. Various satellite systems &services provided

UNIT I INTRODUCTION TO SATELLITE COMMUNICATIONS:

Origin ofsatellite communications, Historical background, basic concepts of satellitecommunications, frequency allocations for satellite services, applications, future trends of satellitecommunications.

Orbital Mechanics:

Orbital Mechanics,look angle determination, orbital perturbations, orbit determination, launches andlaunch vehicles, orbital effects in communication systems performance.

UNIT II SATELLITE SUBSYSTEMS AND LINK DESIGN:

Attitude and orbital control system, Telemetry, Tracking, command and monitoring, power systems,communication subsystems, satellite antenna equipment reliability and space qualification.Basic transmission theory, system noise temperature and G/T ratio, design of down links, uplinkdesign,design of satellite links for specified C/N, system design example.

UNIT III EARTH STATION TECHNOLOGY:

Introduction, transmitters, receivers, Antennas, tracking systems, terrestrial interface, primary powertest methods.

LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS:

Orbit consideration, coverage and frequency considerations, delay and throughput considerations,system considerations, operational NGSO constellation designs.

UNIT IV MULTIPLE ACCESS:

Frequency division multiple access (FDMA) Intermodulation, calculation of C/N, Time Divisionmultiple access (TDMA) frame structure, examples. Satellite switched TDMA onboard processing, DAMA, code division multiple access (CDMA), spread spectrum transmission and reception.

UNIT V SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM:

Radio and satellite navigation, GPS position location principles, GPS receivers and codes, satellitesignal acquisition, GPS navigation message, GPS signal levels, GPS receiver operation, GPS C/Acode accuracy, differential GPS.

Text Books:

1. Timothi Pratt, Charles Bostian and Jeremy Allnutt, “Satellite communications”, WSE, Wiley publications, 2nd Edition, 2003.
2. Wilbur L.Prichard, Robert A. Nelson & Henry G.Suyderhoud, “Satellite communications Engineering”, Pearson Publications, 2nd Edition, 2003.
3. D.C.Agarwal, “Satellite communications”, Khanna publications, 5th Ed.

Reference Books:

1. Dennis Roddy, “Satellite communications”, McGraw Hill, 2nd Edition, 1996.
2. M. Richharia, “Satellite communications: Design principles”, BS publications, 2nd Edition, 2003.
3. K.N.Rajarao, “Fundamentals of Satellite communications”, PHI, 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC62	**TRANSDUCER ENGINEERING**	**L**	**T**	**P**	**C**
	(Professional Elective-IV)	**3**	**-**	**-**	**3**

Objectives

1. To impart knowledge about the principles and analysis of sensors.
2. Discussion of errors and error analysis.
3. Emphasis on characteristics and response of transducers.
4. To have an adequate knowledge in resistance transducers.
5. Basic knowledge in inductance and capacitance transducers and exposure to other transducers.

Outcomes

On completion of the course the student will be able to:

1. Understand the Transducers and its classification.
2. Characteristics of Transducers.
3. Analyze Variable inductance, variable resistance and variable capacitance transducers..
4. Know Piezo electric transducers, IC sensor and Fiber optic Transducer.

UNIT I SCIENCE OF MEASUREMENTS AND INSTRUMENTATION OF TRANSDUCERS

Units and standards – Calibration methods – Static calibration – Classification of errors – Error analysis – Statistical methods – Odds and uncertainty – Classification of transducers – Selection of transducers.

UNIT II CHARACTERISTICS OF TRANSDUCERS

Static characteristics – Accuracy, precision, resolution, sensitivity, linearity etc.

Dynamic characteristics – Mathematical model of transducer – Zero, I and II order transducers. Response to impulse, step, ramp and sinusoidal inputs.

UNIT III VARIABLE RESISTANCE TRANSDUCERS

Principle of operation, construction details, characteristics and application of resistance potentiometer, strain gauge, resistance thermometer, thermistor, hot-wire anemometer, piezoresistive sensor and humidity sensor.

UNIT IV VARIABLE INDUCTANCE AND VARIABLE CAPACITANCE TRANSDUCERS

Induction potentiometer – Variable reluctance transducers – EI pick up – LVDT – Capacitive transducer and types – Capacitor microphone – Frequency response.

UNIT V OTHER TRANSDUCERS

Piezoelectric transducer, magnetostrictive – IC sensor – Digital transducers – Smart sensor – Fibre optic transducer.

Text Books:

1. E.A. Doebelin, 'Measurement Systems – Applications and Design', Tata McGraw Hill, New York, 1990.
2. A.K. Sawhney, 'A course in Electrical & Electronic Measurement and Instrumentation',Dhanpat Rai and Co (P) Ltd., 2004.

Reference Books:

1. D. Patranabis, 'Sensors and Transducers', Prentice Hall of India, 1999.
2. John P. Bentley, 'Principles of Measurement Systems', III Edition, Pearson Education, 2000.
3. Hermann K.P. Neubert, 'Instrument Transducers', Oxford University Press, 2000.
4. D.V.S Murthy, 'Transducers and Instrumentation', Prentice Hall of India, 2001.
5. S. Ranganathan, 'Transducer Engineering', Allied Publishers Pvt. Ltd., 2003.
6. Al Sutko and J.D. Faulk, 'Industrial Instrumentation', Vikas Publications, Delhi, 1996.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC63	**MODERN OPERATING SYSTEMS**	**L**	**T**	**P**	**C**
	(Professional Elective-IV)	**3**	**-**	**-**	**3**

Objectives

To enable the students to

1. Gain advanced knowledge in process management concepts including scheduling.
2. Understand how operating system manages resource sharing among the computer's users.
3. Develop solutions to problems related to synchronization to meet the needs of society and industry.
4. Use concepts such as semaphores, monitors, message-passing and other forms of synchronization among threads

Outcomes

At the end of the course, the students would be able to

1. Understand the concepts of operating system services.
2. Understand the concepts of concurrency and synchronization.
3. Acquire knowledge in file system implementation and storage structure.
4. Acquire knowledge in Remote Procedure Call and Group Communication.

UNIT I INTRODUCTION TO OPERATING SYSTEMS, PROCESS MANAGEMENT

Introduction: Operating system operations, Protection and Security, Distributed Systems, Special Purpose Systems, Open-Source Operating Systems, Operating System Services, System Calls, Virtual machines.

Process Management: Process Concepts, Process State, Process Control Block, Operations on Processes.

UNIT II CONCURRENCY AND SYNCHRONIZATION

Process Synchronization, Critical-Section Problem, Peterson's Solution, Synchronization Hardware, Semaphores, Classic Problems of synchronization, Readers and Writers Problem, Dining Philosophers Problem, Monitors.

UNIT III FILE SYSTEM IMPLEMENTATION AND SECONDARY STORAGE STRUCTURE

File System Interface &Implementation: Concept of a File, Access Methods, Directory Structure, File Sharing, Protection, Allocation Methods, Free Space Management, Efficiency and Performance.

Secondary Storage Structure: Overview of Mass-Storage Structure, Disk Structure, Disk Attachment, Disk scheduling algorithms, Swap-Space Management, Stable-Storage Implementation, Tertiary Storage Structure.

UNIT IV I/O SYSTEMS, PROTECTION

I/O Systems: I/O systems, Hardware, Application Interface, Transforming I/O requests Hardware Operation, STREAMS, Performance.

Protection: Goals of Protection, Principles of Protection, Domain of Protection Access Matrix, Implementation of Access Matrix, and Access control, Revocation of Access Rights.

UNIT V DISTRIBUTED SYSTEMS, SYNCHRONIZATION IN DISTRIBUTED SYSTEMS

Introduction to Distributed systems: Goals of distributed system- hardware and software concepts- design issues, the client server model- Remote Procedure Call and Group Communication. Synchronization in distributed systems: Clock Synchronization- Election Algorithms- the Bully Algorithm- a Ring Algorithm.

Text Book:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne," Operating System Concepts," John Wiley and Sons, Eighth Edition, 2009.
2. Andrew. S. Tanenbaum, "Distributed Operating System," New Delhi, Prentice Hall, 1995.

Reference Books:

1. William Stallings, "Operating Systems – Internals and Design Principles," New Delhi, Fifth Edition, Pearson Education, 2008
2. Charles Crowley "Operating Systems - A Design Approach," New Delhi, First Edition, TMH, 2009.
3. Andrew S. Tanenbaum, ―Modern Operating Systems, Second Edition, Addison Wesley, 2001.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC64	**WIRELESS COMMUNICATION**	**L**	**T**	**P**	**C**
	(Professional Elective -IV)	**3**	**-**	**-**	**3**

Objectives:

1. To understand the basic principles of wireless communication.
2. To provide an overview on practical wireless cellular communication systems.
3. To provide the basic background in wireless data services.
4. To provide the foundation for more advanced courses in related areas.

Outcome:

After learning the course the students should be able to:

1. Understand the basics of propagation of radio signals and concepts of cellular systems
2. Analyze the Mobile radio propagation, fading and diversity concepts
3. Gain knowledge on multiple access techniques i.e. TDMA, CDMA, FDMA etc.
4. Have in-depth understanding of the design consideration and architecture for different Wireless Systems like GSM, CDMA, etc
5. Able to learn recent developments in wireless communications

UNIT I INTRODUCTION TO WIRELESS COMMUNICATION SYSTEM

advancement of mobile communications, Comparison of common wireless systems, Recent trends in Cellular radio and personal communication. Types of Technologies: Second generation (2G), Third Generation (3G), Fourth Generation (4G) Wireless Networks.

UNIT II PROPAGATION MODEL, SMALL SCALE FADING AND DIVERSITY

Study of indoor and outdoor propagation models, Small scale fading and multi-path Small-scale multi-path propagation, parameter of multi-path channels, types of small scale fading, Raleigh and Ricean distribution.

UNIT III MULTIPLE ACCESS TECHNIQUES

Introduction to spread spectrum, TDMA, CDMA, FDMA, OFDM, CSMA Protocols and comparison

UNIT IV WIRELESS SYSTEMS

Introduction to GSM system architecture, Protocols, Localization and calling, Handover, Authentication and security in GSM, GSM speech coding,

Architecture of IS-95 CDMA system, Air interface, CDMA forward channels & reverse channels,

Architecture of IMT-2000/UMTS, air Interface, forward and reverse channels in W-CDMA and CDMA 2000

UNIT V RECENT TRENDS IN WIRELESS COMMUNICATION SYSTEMS

Introduction to Wi-Fi, WiMAX, ZigBee, Software Defined Radio, UWB Radio, Ad hoc Network, Sensor Networks, Security issues, challenges and applications

Text Books:

1. Wireless Communication, Theodore S. Rappaport, Prentice hall 2 Wireless Communications and Networking,Vijay Garg, Elsevier
2. Adhoc Mobile Wireless network, C.K.Toh Pearson

Reference Books

1. Wireless digital communication, Kamilo Feher, PHI
2. Mobile Communications Engineering, William C. Y. Lee, Mc Graw Hill Publications
3. Mobile and personal Communication system and services by Rajpandya, IEEE press (PHI).
4. Wireless Communications-T.L.Singh-TMH
5. Young Kyun Kim and Ramjee Prasad, ―4 G Roadmap and Emerging Communication Technologies ―, Artech house.:

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC65 CELLULAR AND MOBILE COMMUNICATION

(Professional Elective -IV)

L	T	P	C
3	-	-	3

Objectives:

1. To illustrate the cellular concept in mobile communication.
2. To apply the cellular concept to improve capacity in cellular systems with limited radio spectrum.
3. To know about handoffs
4. To understand GSM architecture and various multiple access schemes.

Outcomes:

On completion of the course the student will

1. Understand cellular concept in mobile communication systems.
2. Analyze the significance of improving capacity in cellular systems with limited radio spectrum.
3. Understand the concept of radio wave propagation to calculate the link power budget.
4. Analyze frequency management and channel assignment.

UNIT I CELLULAR MOBILE RADIO SYSTEMS:

Introduction to Cellular Mobile system, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems.

ELEMENTS OF CELLULAR RADIO SYSTEM DESIGN:

General description of the problem, concept of frequency reuse channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a Omni directional Antenna system, Cell splitting, consideration of the components of cellular system.

UNIT II INTERFERENCE:

Introduction to Co-channel interference, real time co-channel interference, Co-channel measurement, design of Antenna system, Antenna parameters and their effects, diversity receiver, non-co-channel interference-different types.

UNIT III CELL COVERAGE FOR SIGNAL AND TRAFFIC:

Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation antenna height gain, form of a point to point model.

UNIT IV FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT:

Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment.

UNIT V HANDOFF:

Handoff, queuing of handoffs dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, micro cells, vehicle locating methods, dropped call rates and their evaluation.

DIGITAL CELLULAR NETWORKS:

GSM architecture and channel modes.

Text Books:

1. W .C. Y. Lee, Mobile Cellular Telecommunications, Tata Mc-Graw Hill, 2nd Edition, 2006.
2. Theodore. S. Rappaport, Wireless Communications, Pearson Education, 2nd Edition, 2002.
3. Jon W.Mark and Weihua Zhqung, Wireless communications and Networking, PHI, 2005.

Reference Books:

1. Gordon L. Stuber, Principles of Mobile communications, Springer International 2nd Edition, 2007.
2. R.Blake, Wireless Communication Technology, Thompson Asia Pvt. Ltd., 2004.
3. Principles of Mobile Communication Das, Mullick & Chatterjee, Wiley Eastern Ltd.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AMB03 PROFESSIONAL ETHICS
Common to (ECE, EEE, CE, MEC, CSE & IT)
(Open Elective - II)

L	T	P	C
3	-	-	3

Objectives:

The course will provide the student:

1. To understand the fundamental concepts of professional ethics.
2. To impart and inculcate ethical decision making.
3. To apply ethical and human values in engineering profession.
4. To prepare engineering students to meet global demands on human values.
5. To explain the importance of environmental protection in engineering activities

Outcomes:

After completion of this course students will be able to:

1. Understand human values and ethical standards to lead career accordingly.
2. Able to incorporate appropriate safety measures in designing systems.
3. Play the role of "responsible engineer" in the society.
4. Use natural resources in a sustainable manner and be conscious of environment.
5. Incorporate safety measures in engineering and product design aspects.

UNIT I INTRODUCTION:

Professionalism-models of professionalism-Ethics-Types of ethics and morality-Engineering ethics-Positive and negative faces of ethics-Responsibility for safety-Technology pessimism and perils of technological optimism.

UNIT II ETHICAL CONCEPTS:

Human Values – morals-integrity-work ethics-Respect for others-respect for authority-conflicts of interests-moral dilemmas-honesty- courage-cooperation-valuing time-commitment-collegiality-loyalty-self -interest-Professional accountability-royalty-Problem of bribery, extortion and grease payments-problem of nepotism, excessive gifts-confidentiality-uses of ethical theories-Kohlberg's Theory- Gilligan`s Theory-Ethical codes of IEEE and Institution of Engineers.

UNIT III ENGINEERS ROLE IN SAFETY:

Safety and risks-risk and costs-risk benefit analysis-Testing methods for safety-The promise of technology-Computer Technology Privacy-Social policy-Engineering standards-the standards care-Social and value dimensions of technology-communicating risk and public policy-occupational crime-professional rights and employee rights-whistle blowing.

UNIT IV ROLES OF ENGINEERS:

Engineers as managers, Advisors, Consultants, Experts and witnesses- Engineers role in industry and society- models of professional roles-Theories about right action-paternalism-different business practices-Moral leadership- Cases - Bhopal gas tragedy, Nuclear power plant disasters.

UNIT V ENVIRONMENTAL ETHICS:

Global Issues-Multinational corporations-Living in harmony with NATURE-Holistic technology-Eco friendly production system-sustainable technology and development-weapon development-Four orders of living, their interconnectedness-Eco system-Ozone depletion-,pollution

Text Books:

1. Subramanian R, Professional Ethics,1st Edition, Oxford University Press. 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values,1st edition, New Age International (P) Limited, Publishers New Delhi.,2014

Reference Books:

1. Fundamentals of Ethics for scientists and Engineers, Edmond G Seebauer and Robert L. Barry, 1st edition Oxford University Press, 2008.
2. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics:, Eecel Books,New Delhi.2010.
3. Professional Ethics and Human Values – M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, PHI Learning Pvt. Ltd. Delhi.
4. Professional Ethics and Human Values: Prof. D.R. Kiran, TATA McGraw Hill Education, 2007.
5. Charles D Fleddermann, “Engineering Ethics”, Prentice Hall.
6. Charles E Harris, Micheal J Rabins, “Engineering Ethics, Cengage Learning.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17ACS57 INTRODUCTION TO INTERNET OF THINGS

(Open Elective - II)

L	T	P	C
3	-	-	3

Objectives:

1. Vision and induction to Internet of things
2. Understand Internet of things market perspective
3. Data and knowledge management and use of devices in IoT
4. Understand the state of art-IoT architecture

Outcomes:

1. Understand the vision of IoT from the global context.
2. Determine the market perspective of IoT
3. Use of devices ,gateways and data management in IoT
4. Designing the state of Architecture for IoT

UNIT I INTRODUCTION AND CONCEPTS:

Introduction to Internet of Things - Physical Design of IoT- Logical Design of IoT – IoT Enabling Technologies – IoT levels & Deployment Templates.

Domain Specific IoTs: Introduction – Home Automation – Cities - Environment – Energy – Retail- Logistics – Agriculture - Industry- Health & Lifestyle.

UNIT II **IOT AND M2M:**

Introduction – M2M- Difference between IoT and M2M- SDN and NFV for IoT- IoT System management with NETCONF-YANG - Need for IoT Systems Management –Simple network Management protocol(SNMP) – Network operator requirements, NETCONF-YANG- IOT systems management with NETCONF-YANG – NETOPEER.

UNIT III DEVELOPING INTERNET OF THINGS:

IoT Platforms Design Methodology - Introduction, IoT Design Methodology- Case Study on IoT System for Weather Monitoring – Motivation for Using Python –Iot Systems-logical Design

UNIT-IV PYTHON

installing Python, Python Data Types &Data Structures, Control flow, functions-Modules-Packages-File Handling-Data/Time Operations-Classes-Python Packages of Interest for IoT.

UNIT V IOT PHYSICAL SERVERS & CLOUD OFFERINGS:

Introduction to Cloud Storage Models & Communication APIs-WAMP-AutoBahn for IoT-Xively Cloud for IoT- Python Web Application Framework-Django-Designing a RESTful Web API-Amazon Web services for IoT- SkyNet IoT Messaging Platform.

Text books:

1. Arshdeep Bahga,Vijay Madisetti"Internet of Things", A HANDS-ON PPROACH, Universities Press.

Reference books:

1. Adrian Mcewen,Hakin Cassimally,"Designing The Internet of Things",EILEY Publications,2015

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AME57	**TOTAL QUALITY MANAGEMENT**	**L**	**T**	**P**	**C**
	(Open Elective - II)	**3**	**-**	**-**	**3**

Objectives:

To make the students learn:

1. The developments in tools of quality and their impact on production.
2. Design teams, Quality councils in building up the organization.
3. The application of value improvement elements and six sigma.
4. Recognize the use of non statistical and statistical tools in real life situations.
5. Comprehending the ISO 9000 and ISO 14000 series of quality standards

Outcomes:

After completion of the course the student will be able to:

1. Summarize TQM concepts with quality standards, tools, value addition and reliability concept.
2. Organize a team and play a key role in decision making with interpretation skills besides continuous learning.
3. Solve industry problems with available sources, software tools, modern TQM techniques with system approach.
4. Select the best solution for problem solving using QFD model and obtain patents for innovative idea and models.
5. Judge the solutions to sustain customer trust-worth-ship besides industry growth by getting ISO certification.

UNIT I INTRODUCTION

Introduction - Need for quality - Evolution of quality - Definitions of quality - Dimensions of product and service quality - Basic concepts of TQM - TQM Framework - Contributions of Deming, Juran and Crosby - Barriers to TQM - Quality statements - Customer focus - Customer orientation, Customer satisfaction, Customer complaints, Customer retention - Costs of quality.

UNIT II TQM PRINCIPLES

Leadership - Strategic quality planning, Quality Councils - Employee involvement - Motivation, Empowerment, Team and Teamwork, Quality circles Recognition and Reward, Performance appraisal - Continuous process improvement - PDCA cycle.

UNIT III TQM TOOLS AND TECHNIQUES-I

The seven traditional tools of quality - New management tools - Six sigma: Concepts, Methodology, applications to manufacturing, service sector including IT - Bench marking - Reason to bench mark, Bench marking process - FMEA - Stages, Fault tree analysis.

UNIT IV TQM TOOLS AND TECHNIQUES-II

Control Charts - Process Capability – Problem solving - Quality Function Development (QFD) - Taguchi quality loss function – Total Productive Maintenance - Concepts, improvement needs - Performance measures. Poka-yoke, Kaizen , JIT.

UNIT V QUALITY SYSTEMS

Need for ISO 9000 - ISO 9001-2008 Quality System - Elements, Documentation, Quality Auditing - QS 9000 - ISO 14000 - Concepts, Requirements and Benefits - TQM Implementation in manufacturing and service sectors

Text Books:

1. Dale H. Besterfiled, et at., "Total quality Management", Third Edition, Pearson Education Asia, Indian Reprint, 2006.
2. "Total quality Management", Dr.K.C.Arora.

Reference Books:

1. James R. Evans and William M. Lindsay, "The Management and Control of Quality", 8th Edition, 1st Edition, Cengage Learning, 2012.
2. Suganthi.L and Anand Samuel, "Total Quality Management", Prentice Hall (India) Pvt. Ltd., 2006.
3. Janakiraman. B and Gopal .R.K., "Total Quality Management - Text and Cases", Prentice Hall (India) Pvt. Ltd., 2006.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AME58	**ENTREPRENEURSHIP**	**L**	**T**	**P**	**C**
	(Open Elective - II)	**3**	**-**	**-**	**3**

Objectives:

1. To understand the concept of entrepreneurship.
2. To examine the impact of entrepreneurship on the economic development.
3. To recognize various entrepreneurship development programmes taken up by the government.
4. To familiarize with various financing schemes available for the development of entrepreneurship in India.
5. To infer the Prospects and Opportunities of MSMEs in economic development

Outcomes

After completion of the course the students will be able to

1. Summarize the need of entrepreneurship in the development of economy.
2. Illustrate the application of concept to become successful entrepreneur and to identify solutions to industry.
3. Identify the optimum solutions with system approach to both industry and service sector.
4. Judge the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.
5. Develop a team and play a key role in decision making with interpretation skills for all round development of organization.

UNIT I INTRODUCTION TO ENTREPRENEURSHIP DEVELOPMENT:

Introduction -- meaning and definition of Entrepreneur and Entrepreneurship. Characteristics of Entrepreneur-Functions of Entrepreneur-Attitude and leadership of Entrepreneur – Entrepreneur Vs Manager – Role of Entrepreneurship in Economic development – Need for rural Entrepreneurship – Women Entrepreneurship.

UNIT II ENTREPRENEURSHIP DEVELOPMENT:

Economic and non- Economic Factors affecting Entrepreneurship Development – Government actions -Entrepreneurship and environment-Policies governing entrepreneurs.

UNIT III ENTREPRENEURIAL MOTIVATION:

Entrepreneurial Motivation, competencies and Mobility – Entrepreneurship Development Programmes (EDPs), Institutions for entrepreneurship development- Entrepreneurship development in other countries – Growth of Entrepreneurship in India.

UNIT IV MICRO SMALL AND MEDIUM ENTERPRISES:

Objectives, Characteristics and Importance of MSMEs in Indian Economic Development – Role of MSMEs during Planning Era – New Small Enterprise Policy 1991 – Policies and Programmes for Promoting MSMEs Working of MSMEs – Drawbacks and problems of MSMEs – Prospects and Opportunities of MSMEs.

UNIT V INSTITUTIONAL FINANCE:

Need of Institutional Infrastructure for MSMEs – Role of commercial Banks, IDBI, SFC, NABARD, SIDO, NSIC, NISIET, NIESBUD, NRDC, SIDBI, DIC, SIDCs for development of MSMEs.

Text Books:

1. David H. Holt – "Entrepreneurship – New Venture Creation" – Prentice Hall, New Delhi – 2003.
2. S.S. Khanka – Entrepreneurial Development – S. Chand And Company Ltd., New Delhi – 1999.

References:

1. D. F. Kuratko, T. V. Rao – "Entrepreneurship: A South Asian Perspective" – Cengage Learning.
2. Entrepreneurship Development – Prepared By Colombo Plan Staff College For Technical Education Manila – Tata Mc-Graw Hill, New Delhi – 1998.
3. Dr. R.R. Khan – Entrepreneurial Management – School Of Management Studies, Mumbai – 1985.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17ACE63	**DISASTER MANAGEMENT**	**L**	**T**	**P**	**C**
	(Open Elective - II)	**3**	**-**	**-**	**3**

Objectives:

1. To provide basic conceptual understanding of disasters and its relationships with development
2. To gain understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction
3. To prevent and control Public Health consequences of Disasters
4. To enhance awareness of Disaster Risk Management institutional processes in India
5. To build skills to respond to disasters

Outcomes:

After learning the course the students should be able to:

1. Understand disasters, disaster preparedness and mitigation measures
2. Understand role of IT, remote sensing, GIS and GPS in risk reduction
3. Understand disaster management acts and guidelines along with role of various stack-holders during disasters
4. Understand various plans and guidelines of Govt. of India
5. Understand Medical and Psycho-Social Response to Disasters

UNIT I UNDERSTANDING DISASTERS

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development, and disaster management.

UNIT II TYPES, TRENDS, CAUSES, CONSEQUENCES AND CONTROL OF DISASTERS

Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves); Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters).

UNIT III DISASTER MANAGEMENT CYCLE AND FRAMEWORK

Disaster Management Cycle – Paradigm Shift in Disaster Management Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Microzonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation – Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment; IDNDR, Yokohama Strategy, Hyogo Framework of Action.

UNIT IV DISASTER MANAGEMENT IN INDIA

Disaster Profile of India – Mega Disasters of India and Lessons Learnt Disaster Management Act 2005 – Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter-Governmental Agencies.

UNIT V APPLICATIONS OF SCIENCE AND TECHNOLOGY FOR DISASTER MANAGEMENT

Geo-informatics in Disaster Management (RS, GIS, GPS and RS), Disaster Communication System (Early Warning and Its Dissemination), Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non Structural Mitigation of Disasters, S&T Institutions for Disaster Management in India.

Text Books:

1. Disaster Management Act 2005, Publisher by Govt. of India.
2. Encyclopedia of disaster management, Vol I, II and IIIL Disaster management policy and administration, S L Goyal, Deep & Deep, New Delhi, 2006.
3. Management of Natural Disasters in developing countries, H.N. Srivastava & G.D. Gupta, Daya Publishers, Delhi, 2006.

Reference Books:

1. Publications of National Disaster Management Authority (NDMA) on Various Templates and Guidelines for Disaster Management.
2. National Disaster Management Policy, 2009, GoI.

3. Satapathy S. Psychosocial care in Disaster management, A training of trainers manual (ToT), NIDM publication, 2009.
4. Taori, K, Disaster Management through Panchayati Raj, Concept Publishing Company, New Delhi, 2005.
5. Roy, P.S. Space Technology for Disaster management: A Remote Sensing & GIS Perspective, Indian Institute of Remote Sensing (NRSA) Dehradun, 2000.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC41 MICROWAVE AND OPTICAL COMMUNICATIONS LAB

L	T	P	C
-	-	3	1.5

Objectives:

Enable the students

1. To analyze the micro-wave bench setup to measure characteristics of different components.
2. To analyze the scattering parameters of different microwave components.
3. To educate the students about the basic concepts of optical communication links.
4. To educate the students about LASER diode.

Outcomes:

On completion of the lab the student will be able

1. To analyze the practical behavior of different microwave components.
2. To test the various applications of optical fiber communications

LIST OF EXPERIMENTS

Note: Minimum **Ten** Experiments to be conducted

(Minimum **Six** from **Part A** and **Four** from **Part B**)

Part – A

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. Directional Coupler Characteristics.
5. VSWR Measurement.
6. Impedance Measurement.
7. Waveguide parameters measurement.
8. Circulator characterstics.
9. Scattering parameters of Magic Tee.

Part – B

1. Characterization of LED.
2. Characterization of Laser Diode.
3. Intensity modulation of Laser output through an optical fiber.
4. Measurement of Data rate for Digital Optical link.
5. Measurement of NA.
6. Measurement of losses for analog Optical link.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC42	**EMBEDDED SYSTEMS LAB**	**L**	**T**	**P**	**C**
	(Common to ECE, EEE, CSE and IT)	**-**	**-**	**3**	**1.5**

Objectives:

1. To know the use of Microcontroller.
2. To know about various scheduling techniques
3. To know about various memory management techniques.
4. To know how to design basic embedded systems

Outcomes:

1. Able to use microcontroller in various applications.
2. Able to design systems where serial communication requires.
3. Able to design simple embedded systems.
4. Able to know real time scheduling.

LIST OF EXPERIMENTS

1. Write a program to a) Clear the Register and b) Add 3 to Register Ten Times and place the result into Memory Use the Indirect Instructions to Perform Looping.
2. To transfer the data serially between two microcontroller kit using RS232C.
3. Write a program to use the **TIMER 0** as a counter.
4. Write a Program to monitor Door Sensor and when it Open, Sounds the Buzzer by sending a Square Wave of few Hundred Hz Frequency to it. A Door Sensor is connected to RB1 Pin and a Buzzer is connected to RB7**.**
5. Write a Program to Toggle all the Bits of PORT B parts continuously with a 250ns delay.
6. Write an Interfacing Program to blink LED.
7. Write an Interfacing Program to blink LED in dancing fashion.
8. Write an Interfacing Program to display numerical characters on LCD.
9. Write a program to implement data transmission using serial mode.
10. Write a program to implement data receiving using serial mode.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC66	**MINI PROJECT**	**L**	**T**	**P**	**C**
		-	**-**	**2**	**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech I Semester ECE

Code: 17AEC82 MOOC- III

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC67	**INTERNSHIP**	**L**	**T**	**P**	**C**
		-	**-**	**-**	**3**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC68	VIDEO ANALYTICS	L	T	P	C
	(Professional Elective-V)	3	-	-	3

Objectives

1. To Understand the need for video analytics
2. To Understand the configuration of video analytics
3. To Understand various functional blocks of a video analytic system
4. For better exposure to the various applications of video analytics.

Outcomes

1. Design of video analytic algorithms for business intelligence
2. Design of Video analytic algorithms for security applications
3. Design of video analytic system for the given target application.

UNIT I VIDEO ANALYTIC COMPONENTS

Need for Video Analytics - Overview of video Analytics - Foreground extraction - Feature Extraction - Classifier - Pre-processing - Edge Detection - Smoothing - Feature space - PCA - FLD - SIFT features

UNIT II FOREGROUND EXTRACTION

Background estimation - Averaging - Gaussian Mixture Model - Optical Flow based - Image Segmentation methodologies - measure of Image and Video Segmentation - Region Growing - Region splitting - Morphological operations - erosion - Dilation - Tracking in a multiple camera environment

UNIT III CLASSIFIERS

Neural networks (back propagation) - Deep learning networks - Fuzzy Classifier - Bayesian classifier - HMM based classifier

UNIT IV VIDEO ANALYTICS FOR SECURITY

Abandoned object detection - - human behavioral analysis - human action recognition - perimeter security - crowd analysis and prediction of crowd congestion

UNIT V VIDEO ANALYTICS FOR BUSINESS INTELLIGENCE & TRAFFIC MONITORING AND ASSISTANCE

Object removal detection - Event Detection and Analysis - Customer behavior analysis - Detection and Tracking people in Complex Scenes - Intelligent people counting - Traffic rule violation detection - traffic congestion identification for route planning - driver assistance - lane change warning.

References

1. Nilanjan Dey, Amira Ashour and Suvojit Acharjee (Editors), Applied Video Processing in Surveillance and Monitoring Systems (IGI global) 2016.
2. Graeme A. Jones, Nikos Paragios, Carlo S. Regazzoni (Editors) Video Based Surveillance Systems : Computer Vision and Distributed Processing, Kluwer academic Publisher, 2001.
3. Zhihao Chen, Ye Yang, Jingyu Xue, Liping Ye, Feng Guo (Author), The Next Generation of Video Surveillance and Video Analytics : The Unified Intelligent Video Analytics Suite, Createspace Independent Publishing Platform, 2014.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC69	**ADVANCED WIRELESS NETWORKS**	**L**	**T**	**P**	**C**
	(Professional Elective-V)	**3**	**-**	**-**	**3**

Objectives:

1. To understand Concepts of MIMO diversity and spatial multiplexing.
2. To Learn about Massive MIMO system
3. To Know millimeter wave communication
4. To understand about software defined radio and cognitive radio

Outcomes:

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

1. Analyze MIMO system.
2. Analyze millimeter wave communication and different transmission schemes.
3. Demonstrate software defined radio and cognitive radio.

UNIT I INFORMATION THEORETIC ASPECTS OF MIMO

Review of SISO fading communication channels, MIMO Channel models, Classical i.i.d. and extended channels, Frequency selective and correlated channels models, Capacity of MIMO channels, Erogodic and outage capacity, capacity bounds and influence of channel properties on the capacity.

UNIT II MIMO DIVERSITY AND SPATIAL MULTIPLEXING

Sources and types of diversity, analysis under Rayleigh fading, Diversity and channel knowledge. Alamouti space time code. MIMO spatial multiplexing: Space time receivers, ML, ZF, MMSE and Sphere decoding, BLAST receivers and Diversity multiplexing trade - off.

UNIT III MASSIVE MIMO SYSTEM

Introduction - MIMO for LTE, capacity of massive MIMO, Pilot Design for massive MIMO, Resource allocation and transceivers design, Base band and RF implementation, Channel Models.

UNIT IV MILLIMETER WAVE COMMUNICATION

Spectrum regulation, Channel propagation, Hardware technology for mmW systems, architecture and mobility, Beam forming techniques, Beam finding, Physical layer techniques - Duplex scheme and Transmission Scheme.

UNIT V SOFTWARE DEFINED RADIO AND COGNITIVE RADIO

SDR - Definition, Origin, key characteristic, hardware and software architecture, waveforms. Cognitive Radio - Definitions, Cognitive theories, architectures, Cognitive radio as self controlling system, Ontology based cognitive radio.

Text Books:

1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", Cambridge University Press 2005.
2. Hamid Jafarkhani, "Space - Time Coding: Theory and Practices", Cambridge University Press 2005.

References:

1. Mischa Dohler, Jose F. Monserrat Afif Osseiran " 5G Mobile and Wireless Communication Technology", Cambridge University Press 2016.
2. Mieczyslaw M Kokar, Lezek Lechowicz, "Cognitive Radio Interoperability through Waveform Reconfiguration" ARTECH House 2016.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC70 MACHINE LEARNING AND APPLICATIONS

(Professional Elective-V)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Objectives:

1. To understand the need for machine learning for various problem solving
2. To study the various supervised, semi-supervised and unsupervised learning algorithms in machine learning
3. To learn the new approaches in machine learning
4. To design appropriate machine learning algorithms for problem solving

Outcomes

At the end of the course, the students will be able to

1. Differentiate between supervised, unsupervised, semi-supervised machine learning approaches
2. Apply specific supervised, unsupervised, semi-supervised machine learning algorithms for a particular problem.
3. Analyse and suggest the appropriate machine learning approach for the various types of problem.
4. Design and make modifications to existing machine learning algorithms to suit an individual application
5. Provide useful case studies on the advanced machine learning algorithms.

UNIT I INTRODUCTION

Learning Problems - Types of learning - Designing a learning system - Perspectives and Issues in Machine Learning - Concept Learning Task - Concept Learning as Search - Version Spaces and Candidate Eliminators - Inductive bias - Decision Tree Learning - Representation - Algorithm - issues - Heuristic Space Search.

UNIT II NEURAL NETWORKS AND GENETIC ALGORITHMS

Neural Network Representation - Perceptrons - Multilayer Networks and Back Propagation Algorithms - Advanced Topics in Neural Networks - Genetic Algorithms - Genetic Operators - Genetic Programming - Models of Evaluation and Learning, Parallelizing Genetic Algorithms.

UNIT III BAYESIAN AND COMPUTATIONAL LEARNING

Bayes Theorem - Concept Learning - Maximum Likelihood and Least Squared Error Hypothesis - Minimum Description Length Principle - Bayes Optimal Classifier - Naive Bayes Classifier - Bayesian Belief Networks - EM Algorithm - Probability Learning - Sample Complexity for Finite and Infinite Hypothesis Spaces - Mistake Bound Model for Learning.

UNIT IV INSTANT BASED LEARNING AND ADVANCED LEARNING

K-Nearest Neighbour Learning - Locally weighted Regression - Radial Basis Functions - Case Based Reasoning - Learning sets of Rules - First Order Rules - Sets of First Order Rules - Analytical Learning - Perfect Domain Theories - Explanation Base Learning - Reinforcement Learning - Learning Task - Q Learning - Temporal Difference Learning.

UNIT V APPLICATIONS OF MACHINE LEARNING ALGORITHMS

Automatic Recognition of Handwritten Postal Codes - Computer Aided Diagnosis - Computer Vision - Driverless Cars - Face Recognition and Security - Speech Recognition - Text Mining - The Present and the Future - Thinking Machines - Smart Machines - Deep Blue - IBM's Watson - Google Now - Apple's Siri - Microsoft's Cortana.

Text Book:

1. Tom M. Mitchell, "Machine Learning", McGraw-Hill Education (India) Private Limited, 2013.

References:

1. Mohssen Mohammed, Muhammad Badruddin Khan, Eihab Bashier Mohammed Bashier, "Machine Learning Algorithms and Applications", CRC Press.
2. Ethem Alpaydin, "Introduction to Machine Learning (Adaptive Computation and Machine Learning)", The MIT Press2004.
3. Stephen Marsland, "Machine Learning : An Algorithm Perspective", CRC Press, 2009.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC71	**CMOS ANALOG IC DESIGN**	**L**	**T**	**P**	**C**
	(Professional Elective-V)	**3**	**-**	**-**	**3**

Objectives:

1. To design analog integrated circuits using MOS transistor
2. To Use different styles of CMOS Circuit modelling to synthesize analog ICs
3. To Apply appropriate biasing techniques to improve performance of analog circuits
4. To analyze the analog integrated circuits suitable for real time applications

Outcomes:

After completion of the course the students will be able to

1. Analyze analog integrated circuits suitable for real time applications.
2. Design and Develop Analog Integrated Circuits using MOS Transistor.
3. Use different styles of CMOS Circuit modeling to synthesize analog ICs.
4. Apply appropriate biasing techniques to improve performance of analog circuits.

UNIT I MOS DEVICE MODELING

MOSFET Capacitances, Latch up in CMOS Technology, Short Channel Effects in MOS Transistors, Weak Inversion in MOS Transistors, Small Signal Modeling of MOS Transistors, Large Signal Modeling of MOS Transistors.

UNIT II CURRENT MIRRORS AND BIASING TECHNIQUES

Current Mirrors - Simple Current Mirrors, Simple Current Mirror with Source Degeneration, Cascode Current Mirror and Wilson Current Mirror.

Biasing Techniques: CS Biasing, CG Biasing, Source Follower

UNIT - III SINGLE STAGE AMPLIFIERS

Common Source Stage with resistive load, Source follower, Common Gate Stage, Cascode Stage

UNIT - IV SAMPLE AND HOLD CIRCUITS, BANDGAP REFERENCE CIRCUITS

Performance of Sample and Hold Circuits, MOS Sample and Hold circuit Basics, Examples of CMOS S/H circuits, Bipolar and BICMOS sample and hold circuits, Band gap voltage gap reference basics, circuits for band gap references

UNIT - V COMPARATORS

Using Op amp for a Comparator, Charge-Injection Errors, Latched Comparators, Examples of CMOS and Bi CMOS Comparators.

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Text Books:

1. David A. Johns, Ken Martin, Analog Integrated Circuit Design , Wiley Student Edition, 1997 Hamid Jafarkhani, "Space - Time.
2. Behzad Razavi, Design of Analog CMOS Integrated Circuits, Tata McGraw Hill, 2nd Edition,

References:

1. Paul R. Gray, Paul J. Hurst, S. Lewis and R. G. Meyer,
2. Analysis and Design of Analog Integrated Circuits, Wiley india ,5th edition ,2013

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC72 ADVANCED DIGITAL SIGNAL PROCESSING

(Professional Elective-V)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Objectives:

To enable the students

1. To understand the design and realization of digital filters.
2. To understand the multirate signal processing.
3. To understand the finite word length effects in digital filters.
4. To emphasize the importance of true estimation of power spectral density

Outcomes:

The student will

1. Have knowledge on the Realization of digital filters.
2. Explain The Parametric Methods For Power Spectrum Estimation.
3. Have knowledge on implementation of sampling rate conversion.
4. Familiar with the various Applications of Digital Signal Processing.

UNIT –I REVIEW OF DFT, FFT, IIR FILTERS AND FIR FILTERS

Introduction to filter structures (IIR & FIR). Frequency sampling structures of FIR, Lattice structures, Forward prediction error, Backward prediction error, Reflection coefficients for lattice realization, Implementation of lattice structures for IIR filters, Advantages of lattice structures.

UNIT -II NON-PARAMETRIC METHODS

Estimation of spectra from finite duration observation of signals, Nonparametric Methods: Bartlett, Welch & Blackman-Tukey methods, Comparison of all Non-Parametric methods

UNIT - III PARAMETRIC METHODS

Autocorrelation & Its Properties, Relation between auto correlation & model parameters, AR Models - Yule-Walker & Burg Methods, MA & ARMA models for power spectrum estimation, Finite word length effect in IIR digital Filters – Finite word-length effects in FFT algorithms.

UNIT –IV MULTI RATE SIGNAL PROCESSING

Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Multistage Implementation of Sampling Rate Conversion, Filter design & Implementation for sampling rate conversion.

UNIT –V APPLICATIONS OF MULTI RATE SIGNAL PROCESSING

Design of Phase Shifters, Interfacing of Digital Systems with Different Sampling Rates, Implementation of Narrow Band Low Pass Filters, Implementation of Digital Filter Banks, Subband Coding of Speech Signals, Quadrature Mirror Filters, Transmultiplexers, Over Sampling A/D and D/A Conversion.

Text Books:

1. Digital Signal Processing: Principles, Algorithms & Applications - J.G.Proakis& D. G. Manolakis, 4 th Ed., PHI.
2. Discrete Time signal processing - Alan V Oppenheim & Ronald W Schaffer, PHI.
3. DSP – A Practical Approach – Emmanuel C. Ifeacher, Barrie. W. Jervis, 2 ed., Pearson Education.

Reference Books:

1. Modern spectral Estimation: Theory & Application – S. M .Kay, 1988, PHI.
2. Multi Rate Systems and Filter Banks – P.P.Vaidyanathan – Pearson Education.
3. Digital Signal Processing: A Practitioner's Approach, Kaluri V. Rangarao, Ranjan K. Mallik, John Weley.
4. Digital Signal Processing – S.Salivahanan, A.Vallavaraj, C.Gnanapriya, 2000,TMH

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC73 DSP PROCESSORS AND ARCHITECTURES

(Professional Elective-VI)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Objectives:

1. To introduce the basic concepts of DSP
2. To introduce the concepts of DSP Processor and its architectures.
3. To implement the basic DSP algorithms using DSP processor
4. To understand Interfacing memory and I/O devices to programmable DSP devices.

Outcomes:

At the end of this course, the students will be able to understand about the

1. DSP Processors- TMS320C54XX.
2. Implementation of basic DSP algorithms using DSP Processors.
3. Various bus architectures and memory
4. Memory interfacing to Programmable DSP devices

UNIT-I INTRODUCTION TO DIGITAL SIGNAL PROCESSING

Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation Computational Accuracy in DSP Implementations: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT-II ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES

Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT-III PROGRAMMABLE DIGITAL SIGNAL PROCESSORS

Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX Processors, Memory space, Program Control, Instructions and Programming, On-Chip Peripherals, Interrupts and Pipeline Operation of TMS320C54XX Processors.

UNIT-IV IMPLEMENTATIONS OF BASIC DSP ALGORITHMS

The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing. An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, BitReversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT-V INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES

Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

Text Books:

1. Avtar Singh and S. Srinivasan, Digital Signal Processing, Thomson Publications, 2004.
2. Lapsley et al, DSP Processor Fundamentals, Architectures & Features, S. Chand & Co, 2000.

References:

1. Jonathan Stein, Digital Signal Processing, John Wiley, 2005.
2. B. Venkata Ramani and M. Bhaskar, Digital Signal Processors, Architecture, Programming and Applications, TMH, 2004.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC74 NANOTECHNOLOGY AND APPLICATIONS

(Professional Elective-VI)

L	T	P	C
3	-	-	3

Objective:

1. Nano Technology is one of the core subjects of multidisciplinary nature.
2. This has extensive applications in various fields.
3. The objective here is imparting the basic knowledge in Nano Technology.

Outcome:

1. The present syllabus of "Nano Technology and Applications" will give insight into many aspects of Nano Electronics, Nano Optics.
2. Students can able to know about Various Tools to Characterize Nano Materials.
3. Students can gain the knowledge about Nano technology and their Applications.

UNIT- I INTRODUCTION

History and Scope, Classification of Nano structured Materials, Fascinating Nanostructures, Applications of Nano materials, Nature: The Best of Nanotechnologist, Challenges, and Future Prospects.

UNIT-II NANO ELECTRONICS

Electronics and Nano electronics: Basic Electronic Terminology and symbols, Fundamental Types of Electronic Materials, Fundamental Kinds of Electronic Devices, The nano Perspective. Micro Electronics: Introduction to Band Structure, basic Conductor and Semiconductor Physics, transistors. Nano Scale Electronics: Background, The current State of Microelectronics and Extensions to the Nanoscale.Nanotechnolgy –based strategies: single-Electron tunneling, Molecular Wires.

UNIT-III NANO-OPTICS

Introduction to optics: Interactions of light with matter, the nano perspective. The Surface Plasmon: The Surface Plasmon Resonance, Scattering, Color generation from Nano particles and Nano Structures, Applications of Nano plasmonics. NanoPhotonics: Photonics, Photonic Structure in living Systems, Photonic Crystals. Fabrication of Nano Photonic Crystals.

UNIT - IV TOOLS TO CHARACTERIZE NANO MATERIALS

X-Ray Diffraction (XRD), Small Angle X-ray scattering (SAXS), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Atomic Force Microscopy (AFM), Scanning Tunneling Microscope (STM), Field Ion Microscope (FEM), Three-dimensional Atom Probe (3DAP), Nano indentation.

UNIT V APPLICATIONS OF NANO TECHNOLOGY: Nano sensors, Nano catalysts, Food and Agricultural Industry, Cosmetic and Consumer Goods, Structure and Engineering, Automotive Industry, Water Treatment and the environment, Nano-medical applications, Textiles, Paints, Energy, Defence and Space Applications, Concerns and challenges of Nanotechnology.

Text Books:

1. Text Book of Nano Science and Nano Technology – B.S. Murthy, P. Shankar, Baldev Raj, B.B. Rath and James Munday, University Press-IIM.
2. Fundamentals of nanotechnology – Gabor L. Hornyak , John J. Moore, H.F.Tibbals , Joy deep dutta, 1st Edition, CRC Press Dec 22,2008 (II & III unit)
3. Introduction to Nanotechnology – Charles P. Poole, Jr., and Frank J. Owens, Wley India Edition, 2012.

References Books:

1. Nano: The Essentials by T. Pradeep, Mc Graw- Hill Education.
2. Nanomaterials, Nanotechnologies and Design by Michael F. Ashby, Paulo J. Ferreira and Daniel L. Schodek.
3. Transport in Nano structures- David Ferry, Cambridge University press 2000
4. Nanofabrication towards biomedical application: Techniques, tools, Application and impact – Ed. Challa S., S. R. Kumar, J. H. Carola.
5. Carbon Nanotubes: Properties and Applications- Michael J. O'Connell.
6. Electron Transport in Mesoscopic systems – S. Dutta, Cambridge University press.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC75 ELECTRONICS PACKAGING AND TESTING

(Professional Elective-VI)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Objective:

1. To Give A Comprehensive Introduction To The Various Packaging Types Used Along With The Associated Same The Thermal, Speed, Signal And Integrity Power Issues.
2. To Introduce About CAD Used In Designing Wiring Boards
3. The objective of this course is to sensitize the undergraduate students and graduate students to the all-important multidisciplinary area of electronics systems packaging.
4. The course will discuss all the important facets of packaging at three major levels, namely, chip level, board level and system level.
5. The entire spectrum of microelectronic systems packaging from design to fabrication; assembly and test will be covered. Current trends in packaging of electronic systems will be covered.

Outcome:

1. Given an electronic system PCB or integrated circuit design specifications.
2. The student should be in a position to recommend the appropriate packaging style to be used, and propose a design a design procedure and solution for the same.

UNIT I OVERVIEW OF ELECTRONIC SYSTEMS PACKAGING

Definition Of A System And History Of Semiconductors, Products And Levels Of Packaging, Packaging Aspects Of Handheld Products, Definition Of PWB, Basics Of Semiconductor And Process Flowchart, Wafer Fabrication, Inspection And Testing, Wafer Packaging; Packaging Evolution; Chip Connection Choices, Wire Bonding, TAB And Flip Chip.

UNIT II SEMICONDUCTOR PACKAGES

Single Chip Packages Or Modules (SCM), Commonly Used Packages And Advanced Packages; Materials In Packages; Thermal Mismatch In Packages; Multichip Modules (MCM)-Types; System-In-Package (SIP); Packaging Roadmaps; Hybrid Circuits; Electrical Design Considerations In Systems Packaging, Resistive, Capacitive And Inductive Parasitics, Layout Guidelines And The Reflection Problem, Interconnection.

UNIT III CAD FOR PRINTED WIRING BOARDS

Benefits From CAD; Introduction To DFM, DFR & DFT, Components Of A CAD Package And Its Highlights, Beginning A Circuit Design With Schematic Work And Component, Layout, DFM Check, List And Design Rules; Design For Reliability, Printed Wiring Board Technologies: Board-Level Packaging Aspects, Review Of CAD Output Files For PCB Fabrication; Photo Plotting And Mask Generation, Process Flow-Chart; Vias; PWB Substrates; Surface Preparation, Photoresist And Application Methods; UV Exposure And Developing; Printing Technologies For PWBs, PWB Etching; PWB Etching; Resist Stripping; Screen-Printing Technology

UNIT IV SURFACE MOUNT TECHNOLOGY

SMD Benefits; Design Issues; Introduction To Soldering, Reflow And Wave Soldering Methods To Attach SMDs, Solders; Wetting Of Solders; Flux And Its Properties; Defects In Wave Soldering, Vapour Phase Soldering, BGA Soldering And De soldering/Repair; SMT Failures, SMT Failure Library And Tin Whisker, Tin-Lead And Lead-Free Solders; Phase Diagrams; Thermal Profiles For Reflow Soldering; Lead Freev Alloys, Lead-Free Solder Considerations; Green Electronics; RoHS Compliance And E-Waste Recycling, Issues.

UNIT V EMBEDDED PASSIVES TECHNOLOGY

Introduction To Embedded Passives; Need For Embedded Passives; Design Library; Embedded Resistor Processes, Embedded Capacitors; Processes For Embedding Capacitors; Case Study Examples.

Text Books:

1. Rao R. Tummala, “Fundamentals Of Microsystems Packaging”, McGraw Hill, NY, 2001

References:

1. William D. Brown, “Advanced Electronic Packaging”, IEEE Press, 1999.
2. NPTEL

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC76 MIXED SIGNAL IC DESIGN

(Professional Elective-VI)

L	T	P	C
3	-	-	3

Objectives:

1. To know mixed signal circuits like DAC, ADC, PLL etc.
2. To gain knowledge on filter design in mixed signal mode.
3. To acquire knowledge on design different architectures in mixed signal mode.

Outcomes:

After completion of the course the students will be able to

1. Analyze mixed signal circuits suitable for real time applications.
2. Design filters in mixed signal mode.
3. Design different architectures in mixed signal mode

Unit I PHASE LOCKED LOOP

Characterization of a comparator, basic CMOS comparator design, analog multiplier design, PLL simple PLL, charge pump PLL, applications of PLL.

Unit II SAMPLING CIRCUITS

Basic sampling circuits for analog signal sampling, performance metrics of sampling circuits, different types of sampling switches. Sample and Hold Architectures Open loop & closed loop architectures, open loop architecture with miller capacitance, multiplexed input architectures, recycling architecture, switched capacitor architecture, current mode architecture.

UNIT III D/A CONVERTER ARCHITECTURES

Input/output characteristics of an ideal D/A converter, , performance metrics of D/A converter, D/A converter in terms of voltage, current, and charge division or multiplication, , switching functions to generate an analog output corresponding to a digital input. Resistor Ladder architectures, Current steering architectures

UNIT IV A/D CONVERTER ARCHITECTURES

Input /output characteristics and quantization error of an A/D converter, performance metrics of pipelined architectures, Successive approximation architectures ,interleaved architectures.

UNIT V INTEGRATOR BASED FILTERS

Low Pass filters, active RC integrators, MOSFETC integrators, trans conductance c integrator, discrete time integrators. Filtering topologies bilinear transfer function and bi quadratic transfer function.

Text Books:

1. Razavi, “Design of analog CMOS integrated circuits”, McGraw Hill, Edition 2002.
2. Razavi, “Principles of data conversion system design”, Wiley IEEE Press, 1st Edition, 1994.
3. Jacob Baker, “CMOS Mixed Signal circuit design”, IEEE Press, 2009.

Reference books:

1. Gregorian, Temes, “Analog MOS Integrated Circuit for signal processing”, John Wiley & Sons, 1986 .
2. Baker, Li, Boyce, CMOS: Circuit Design, layout and Simulation”, PHI, 2000.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

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IV B.Tech II Semester ECE

Code: 17AEC77 ADVANCED WIRELESS COMMUNICATION

(Professional Elective-VI)	**L**	**T**	**P**	**C**
	3	**-**	**-**	**3**

Objectives:

1. To understand Concepts of MIMO diversity and spatial multiplexing.
2. To Learn about Massive MIMO system
3. To Know millimeter wave communication
4. To understand about software defined radio and cognitive radio

Outcomes:

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

1. Analyze MIMO system.
2. Analyze millimeter wave communication and different transmission schemes.
3. Demonstrate software defined radio and cognitive radio.

UNIT I INFORMATION THEORETIC ASPECTS OF MIMO

Review of SISO fading communication channels, MIMO Channel models, Classical i.i.d. and extended channels, Frequency selective and correlated channels models, Capacity of MIMO channels, Erogodic and outage capacity, capacity bounds and influence of channel properties on the capacity.

UNIT II MIMO DIVERSITY AND SPATIAL MULTIPLEXING

Sources and types of diversity, analysis under Rayleigh fading, Diversity and channel knowledge. Alamouti space time code. MIMO spatial multiplexing: Space time receivers, ML, ZF, MMSE and Sphere decoding, BLAST receivers and Diversity multiplexing trade - off.

UNIT III MASSIVE MIMO SYSTEM

Introduction - MIMO for LTE, capacity of massive MIMO, Pilot Design for massive MIMO, Resource allocation and transceivers design, Base band and RF implementation, Channel Models.

UNIT IV MILLIMETER WAVE COMMUNICATION

Spectrum regulation, Channel propagation, Hardware technology for mmW systems, architecture and mobility, Beam forming techniques, Beam finding, Physical layer techniques - Duplex scheme and Transmission Scheme.

UNIT V SOFTWARE DEFINED RADIO AND COGNITIVE RADIO

SDR - Definition, Origin, key characteristic, hardware and software architecture, waveforms. Cognitive Radio - Definitions, Cognitive theories, architectures, Cognitive radio as self controlling system, Ontology based cognitive radio.

Text Books:

1. David Tse and Pramod Viswanath, "Fundamentals of Wireless Communication", Cambridge University Press 2005.
2. Hamid Jafarkhani, "Space - Time Coding: Theory and Practices", Cambridge University Press 2005.

References:

1. Mischa Dohler, Jose F. Monserrat Afif Osseiran " 5G Mobile and Wireless Communication Technology", Cambridge University Press 2016.
2. Mieczyslaw M Kokar, Lezek Lechowicz, "Cognitive Radio Interoperability through Waveform Reconfiguration" ARTECH House 2016.

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC78	**COMPREHENSIVE VIVA - VOCE**	**L**	**T**	**P**	**C**
		-	**-**	**-**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech II Semester ECE

Code: 17AEC79	**PROJECT WORK**	**L**	**T**	**P**	**C**
		-	**-**	**20**	**12**