ACADEMIC REGULATIONS

COURSE STRUCTURE

AND

DETAILED SYLLABI

B. Tech Regular Four Year Degree Course

(For the Batches Admitted From 2017-2018)

&

B. Tech (Lateral Entry Scheme)

(For the Batches Admitted From 2018-2019)

ELECTRICAL AND ELECTRONICS ENGINEERING

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

(Affiliated to JNTUA, Anantapuramu, Approved by AICTE, New Delhi)

R.V.S. Nagar, CHITTOOR – 517 127, A.P

Phones: (08572) 246339, 245044 Fax: (08572) – 245211

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FOREWORD

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

Sri Venkateswara College of Engineering and Technology is proud to win the confidence of all the above bodies monitoring the quality in education and has gladly accepted the responsibility of sustaining, the standards and ethics it has been striving for more than a decade in reaching its present standing in the arena of contemporary technical education. As a follow up, statutory bodies like Academic Council and Boards of Studies are constituted with the guidance of the Governing Body of the College and recommendations of the JNTUA, Ananthapuramu to frame the regulations, course structure and syllabi under autonomous status.

The autonomous regulations, course structure and syllabi have been prepared after prolonged and detailed interaction with several expertise solicited from academics, industry and research, to produce quality engineering graduates to the society.

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

Principal

INSTITUTE VISION

To carve the youth as dynamic, competent, valued and knowledgeable professionals who shall lead the Nation to a better future and to mould the institution into a Center of Academic Excellence and advanced Research.

INSTITUTE MISSION

- To provide quality education, student-centered teaching-learning processes and state-of-art infrastructure for professional aspirants hailing from both rural and urban areas.
- To impart technical education that encourages independent thinking, develops strong domain of knowledge, contemporary skills and positive attitudes towards holistic growth of young minds.

QUALITY POLICY

Sri Venkateswara College of Engineering and Technology strides towards excellence by adopting a system of quality policies and processes with continued improvements to enhance student's skills and talent for their exemplary contribution to the society, the nation and the word.

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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 :

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

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.

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.

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

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.

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.**

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.

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.

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

Course Duration

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.

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.

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

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

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).

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

Question Paper Pattern for Sessional Examinations

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.

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.

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.

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.

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

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.

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:

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

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

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.

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.

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.

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

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.

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.

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.

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.

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

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.

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.

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.

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.

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.

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.

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.

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

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.

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.

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

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

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

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.

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

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 marksfor any subject in that semester.

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.

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.

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

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.

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.

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

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)

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

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.

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

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

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.

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.

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

DEPARTMENT VISION

- To be recognized as a center of excellence to produce competent and ethical Electrical Engineers capable of finding solutions to problems related to society, environment and industry using innovative technologies.

DEPARTMENT MISION

- **M1:** To establish suitable forums and state-of-the art resources to enhance the faculty members creative and innovative endeavours in teaching and research in Electrical Engineering and allied fields
- **M2:** To deliver knowledge among students through contemporary curriculum and modern pedagogical methods in the areas of electrical engineering and interdisciplinary areas
- **M3:** To enable students, develop skills in solving complex engineering problems of current times and also provide a framework for promoting collaborative and multidisciplinary activities
- **M4:** To nurture the personality traits among the students in different dimensions emphasis the ethical values and to address needs of the nation.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO 1: Excel in professional career and/or higher education by acquiring knowledge in Mathematics and Basic Electrical Sciences, Power Systems, Power Electronics and Electrical Drives.

PEO 2: Identify the problems in society and design Electrical systems appropriate to its solutions through starting companies, producing economically feasible and socially acceptable.

PEO 3. Exhibit professionalism, ethical attitude, communication skills, team work in their profession and adapt to current trends in technology by engaging in continuous professional development.

PROGRAM SPECIFIC OUTCOMES (PSO'S)

PSO1: Identify, formulate and investigate various problems of electrical and electronic circuits, power electronics and power systems by applying the fundamental knowledge of mathematics, science and engineering.

PSO2: Design, develop and implement multidisciplinary projects in the field of electrical power and energy using state-of-the-art technologies and modern software tools.

PSO3: Design and develop sustainable models in the fields of Generation, Transmission, Distribution, Control systems and Renewable Energy Systems

PROGRAM OUTCOMES (PO'S) :

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Structure & Scheme of Examination

I B.Tech., I Semester **Regulations: R17**

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
17AHS05	Environmental Studies	HS	Foundation	3	-	-	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**	**2**	**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
17ACS03	Data Structures	ES	Foundation	3	-	-	3	40	60	100
17AEC01	Electronic Devices & Circuits	ES	Foundation	3	1	-	3	40	60	100
17AEE04	Electrical Circuits	PC	Foundation	3	1	-	3	40	60	100
17AEE05	Electrical Engineering Materials	PC	Foundation	3	1	-	3	40	60	100
17AHS06	Engineering Chemistry lab	BS	Foundation	-	-	3	1.5	40	60	100
17ACS05	Data structures Lab	ES	Foundation	-	-	3	1.5	40	60	100
17AME03	Engineering Practice Lab	ES	Foundation	-	-	2	1	40	60	100
	***Audit Course– I	AC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**4**	**8**	**22**	**360**	**540**	**900**

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 & Complex Analysis	BS	Foundation	3	1	-	3	40	60	100
17ACE09	Fluid Mechanics and Hydraulic Machinery	ES	Foundation	3	-	-	3	40	60	100
17AMB01	Managerial Economics and Financial Analysis	HS	Foundation	3	-	-	3	40	60	100
17AEC04	Switching Theory and Logic Design	ES	Core	3	1	-	3	40	60	100
17AEE07	Network Analysis and Synthesis	PC	Core	3	1	-	3	40	60	100
17AEE08	Electromagnetic Fields	PC	Core	3	1	-	3	40	60	100
17AEC07	Electronic Devices & Circuits Lab	ES	Foundation	-	-	3	1.5	40	60	100
17AHS17	Technical writing and content development Lab	BS	Foundation	-	-	2	1	40	60	100
17AEE09	Electrical Circuits Lab	PC	Core	-	-	3	1.5	40	60	100
17AHS18	English for Communication - II	MC	Perspective	-	-	-	-	40	60	100
17AME64	Introduction to Engineering Projects	MC	Perspective	-	-	-	-	40	60	100
TOTAL				**18**	**4**	**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
17AEE12	DC Machines and Transformers	PC	Core	3	1	-	3	40	60	100
17AEE13	Generation of Electrical Power	PC	Core	3	1	-	3	40	60	100
17AEC03	Signals & Systems	ES	Core	3	1	-	3	40	60	100
17AEC12	Analog and Digital Electronic Circuits	ES	Core	3	1	-	3	40	60	100
17AEE14	Control Systems	PC	Core	3	1	-	3	40	60	100
17AEE15	Electrical and Electronics Measurements	PC	Core	3	1	-	3	40	60	100
17AEC17	Analog and Digital Circuits Lab	ES	Core	-	-	3	1.5	40	60	100
17AEE16	Electrical Measurements Lab	PC	Core	-	-	2	1	40	60	100
17AEE17	DC Machines and Transformers Lab	PC	Core	-	-	3	1.5	40	60	100
17AME65	Engineering Projects in Community Service	MC	Perspective	-	-	-	-	40	60	100
	***Audit Course– II	AC	Perspective	-	-	-	-	-	-	-
TOTAL				**18**	**6**	**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
17AMB02	Management Science	HS	Foundation	3	-	-	3	40	60	100
17AEE18	Induction and Synchronous Machines	PC	Core	3	1	-	3	40	60	100
17AEC21	Microprocessors & Microcontrollers	ES	Core	3	1	-	3	40	60	100
17AEE19	Power Electronics	PC	Core	3	1	-	3	40	60	100
17AEE20	Transmission & Distribution of Electrical Power	PC	Core	3	1	-	3	40	60	100
	*Professional Elective–I	PE	Elective	3	1	-	3	40	60	100
17AEE26	Control Systems Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE27	Induction and Synchronous Machines Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE28	Transmission and Distribution Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE29	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AEE72	MOOC-I	-	-	-	-	-	-	-	-	-
TOTAL				**18**	**5**	**9**	**23**	**360**	**640**	**1000**

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
17AEC28	Digital Signal Processing	ES	Core	3	1	-	3	40	60	100
17AEE30	Power Semiconductor Drives	PC	Core	3	1	-	3	40	60	100
17AEE31	Power System Analysis	PC	Core	3	1	-	3	40	60	100
17AEE32	Switch Gear & Protection	PC	Core	3	1	-	3	40	60	100
	*Professional Elective-II	PE	Elective	3	1	-	3	40	60	100
	**Open Elective – I	OE	Elective	3	-	-	3	40	60	100
17AEE40	Power Electronics Lab	PC	Core	-	-	3	1.5	40	60	100
17AEC35	Microprocessors & Microcontrollers Lab	ES	Core	-	-	3	1.5	40	60	100
17AEE41	Power Systems and Protection Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE42	Comprehensive Online Examination	-	Skill	-	-	-	0.5	-	100	100
17AEE73	MOOC-II	-	-	-	-	-	-	-	-	-
TOTAL				**18**	**5**	**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
17AEE43	HVDC & FACTS	PC	Core	3	1	-	3	40	60	100
17AEE44	Power System Operation & Control	PC	Core	3	1	-	3	40	60	100
17AEE45	Advanced Control Systems	PC	Core	3	1	-	3	40	60	100
	*Professional Elective - III	PE	Elective	3	-	-	3	40	60	100
	*Professional Elective -IV	PE	Elective	3	-	-	3	40	60	100
	**Open Elective – II	OE	Elective	3	-	-	3	40	60	100
17AEE56	Advanced Electric Drives Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE57	Electrical Simulation Lab	PC	Core	-	-	3	1.5	40	60	100
17AEE58	Mini Project	-	Skill	-	-	2	1	40	60	100
17AEE74	MOOC-III	-	-	-	-	-	-	-	-	-
TOTAL				**18**	**3**	**8**	**22**	**360**	**540**	**900**

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
	Internship/ *Professional Elective-V	-	Elective	3	-	-	3	40	60	100
	*Professional Elective-VI	-	Elective	3	-	-	3	40	60	100
17AEE70	Comprehensive Viva-Voce	MC	Core	-	-	-	2	-	100	100
17AEE71	Project Work	MC	Core	-	-	20	12	40	60	100
TOTAL				**6**	**-**	**20**	**20**	**120**	**280**	**400**

***** Refer to Professional Elective Courses List Appended
** Refer to Open Elective Courses List Appended
*** Refer to Audit Courses List Appended

*Professional Elective – I		
Course Code	**Subject**	**Offering Department**
17AEE21	Special Electrical Machines	EEE
17AEE22	Wind & Solar Power Systems	EEE
17AEE23	Soft Computing Techniques	EEE
17AEE24	Instrumentation	EEE
17AEE25	Discrete time Control Systems	EEE
***Professional Elective – II**		
Course Code	**Subject**	**Offering Department**
17AEE33	Modeling and Analysis of Electric Machines	EEE
17AEE34	High Voltage Engineering	EEE
17AEE35	Industrial Automation and Control	EEE
17AEE36	Energy Management Systems and SCADA	EEE
17AEE37	Utilization of Electrical Energy	EEE
***Professional Elective – III**		
Course Code	**Subject**	**Offering Department**
17AEE38	Embedded System Technologies	EEE
17AEE46	Power System Deregulation	EEE
17AEE65	Power Quality	EEE
17AEE48	Distribution System Automation	EEE
17AEE49	VLSI Design for Electrical Systems	EEE
***Professional Elective – IV**		
Course Code	**Subject**	**Offering Department**
17AEE50	Design Of Electrical Systems	EEE
17AEE51	Advanced Power System Protection	EEE
17AEE52	EHV AC Transmission	EEE
17AEE53	Energy Auditing & Management	EEE
17AEE55	Reliability Engineering and Applications to Power Systems	EEE
Internship/*Professional Elective – V		
Course Code	**Subject**	**Offering Department**
17AEE59	Internship	EEE
17AEE60	Distributed Generation and Micro Grid	EEE
17AEE61	Electric Vehicles	EEE
17AEE62	Industrial Drives and Automation	EEE
17AEE63	Design of Electrical Apparatus	EEE
17AEE64	Biomedical Instrumentation	EEE

*Professional Elective – VI		
Course Code	**Subject**	**Offering Department**
17AEE47	Smart Electric Grid	EEE
17AEE66	Modeling of Power System Components	EEE
17AEE67	Operation and Control of Power Systems	EEE
17AEE68	Optimal Control Systems	EEE
17AEE69	Digital Control Systems	EEE

**Open Elective – I		
Course Code	**Subject**	**Offering Department**
17ACS06	Object Oriented Programming through Java	CSE
17AEC43	MEMS and Micro Systems	ECE
17AME40	Robotics	ME
17ACS07	Database Management Systems	CSE
17AEC44	Communication Engineering	ECE
**Open Elective – II		
Course Code	**Subject**	**Offering Department**
17AME56	Optimization Techniques	ME
17ACS21	Computer Networks	CSE
17ACE63	Disaster Management	CE
17AME38	Reliability Engineering	ME
17AMB03	Professional Ethics	MBA

***Audit Course – I		
Course Code	**Subject**	**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	**Subject**	**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

(AUTONOMOUS)

I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE) /

II Semester (Common to Civil Engineering, ME & AE)

L	T	P	C
3	-	-	3

17AHS01 ENGLISH FOR COMMUNICATION - I

Course Outcomes:

1. Communicate ideas effectively to the target audience.
2. Develop LSRW skills.
3. Apply the acquired technology in their communication.
4. Develop skills to meet the demands of Industry and corporative world.
5. Apply grammatical concepts in regular communication.

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:

6. Articles
7. Prepositions
8. Tenses
9. 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- Atithi Devo Bhava- Tourism 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 PRESCRIBED:

Mindscapes, Orient Blackswan.

REFERENCE BOOKS:

1. M. Ashraf RizWi, "Technical English Communication", Tata Mc Graw 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.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	2	-	-	-	3	-	-
CO2	3	2	-	-	-	3	-	-	-	3	-	-
CO3	3	3	-	-	-	3	-	-	-	3	-	-
CO4	2	2	-	-	-	3	-	-	-	3	-	-
CO5	2	1	-	-	-	1	-	-	-	2	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – I Semester (Common to All Branches)

L	T	P	C
3	1	-	3

17AHS02 DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS

Course Outcomes:

After completion of the course the student will be able to

1. Classify and interpret the solutions of ordinary differential equations.
2. Explain concepts of maxima and minima of function of several variables.
3. Apply multiple integral techniques by evaluating areas bounded by regions.
4. Solving system of linear equations and determine the eigen values and eigen vectors.
5. Illustrate the physical interpretation of concepts of vector calculus

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, $e^{ax}\,V(x)$, $x^m V(x)$ 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 Mc Grawhill.
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.

Mapping of CO's- PO's-PSO's

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – I Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE) /

II Semester (Common to Civil Engineering, ME & AE)

L	T	P	C
3	1	-	3

17AHS03 ENGINEERING PHYSICS

Course Outcomes:

1. Apply concepts of optics, lasers and fibre optics, and their application in both scientific and technological systems
2. Determine crystal properties, Crystal defects ,periodicity and structures using X-rays and various ultrasonic techniques
3. Define quantum structure of sub-atomic particles
4. Apply superconducting and magnetic materials and their applications to understand electronic devices.
5. Apply semiconductors and nanomaterials to design equipment.

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.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2		1								
CO2	3	2		2	1							
CO3	3	2										
CO4	3	2		2								1
CO5	2	2										1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech- I Semester (Common to All Branches)

L	T	P	C
3	-	-	3

17ACS01 COMPUTER PROGRAMMING IN C

Course Outcomes:

After 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:

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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	3	3	-	-	-				1	-	-	-
CO2	3	-	-	-	-	-	-	-				-	3	3	-
CO3	-	3	3	-	3	-	-	-				-	-	-	-
CO4	-	3	1	3	-	-	-	-				3	3	3	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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L	T	P	C
3	-	-	3

17AHS05 ENVIRONMENTAL STUDIES

Course 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 cultural 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, Mc Graw 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 Scottt Spoolman, 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. Erach Bharucha, 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, Pragati Prakashan Publications, 2nd edition, Meerut, 2003

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	1	-	-	-	-	-	2	-	-	-	-	2	1	-
CO3	3	2	1	1	-	-	3	-	-	-	-	-	-	1	-
CO4		3	2	1	-	-	3	2	-	-	-	-	2	-	-
CO5	-	-	3	1	-	-	-	-	-	-	-	-	-	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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II Semester (Common to Civil Engineering, ME & AE)

L	T	P	C
1	-	4	3

17AME02 COMPUTER AIDED ENGINEERING DRAWING

Course 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.

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.Basant Agrawal and C.M.Agrawal, Engineering Drawing, Mc Graw Hill Education 2e

Reference Books:

1. K.Venugopal, Engineering Drawing and Graphics + AutoCad , New Age International (P) Ltd,Publishers, New Delhi, Fourth Edition
2. Siddiquee Arshad. 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 CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3	3	-	-	-	-					3	2	-
CO2	2	3	1	3	-	-	-	-				2	2	3	-
CO3	2	3	2	3	2	-	-	-				2	-	-	-
CO4	3	3	3	1	3	-	-	-				3	2	2	-
CO5	2	3	1	3	-	-	-	-				2	2	3	-

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II Semester (Civil Engineering, ME & AE)

L	T	P	C
-	-	2	1

17AHS07 COMMUNICATION SKILLS LAB

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.

Course Outcomes:

1. Recognize English sounds- Monopthongs, Diphthongs and consonantal sounds.
2. Use correct Pronunciation in English.
3. Differentiate between Received Pronunciation and varieties of English.
4. Apply proper stress pattern in speaking English language.
5. Demonstrate skills to meet the demands of the industry.

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, Dr Shalini Verma, S. Chand & Co, 2008.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	-	-	-	3	-	-
CO2	1	-	-	-	-	2	-	-	-	3	-	-
CO3	2	-	-	-	-	2	-	-	-	3	-	-
CO4	1	1	-	-	-	1	-	-	-	3	-	-
CO5	2	2	-	-	-	2	-	-	-	3	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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L	T	P	C
	--	3	1.5

17AHS08 ENGINEERING PHYSICS LAB

Course Outcomes:

1. Explain importance of optical phenomenon like interference and diffraction of light
2. Define concepts pertaining to optical fiber, semiconductor, magnetic materials, lasers and their relative parameters
3. Use optical fibers 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.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3			1								
CO2	3				1							
CO3	3											

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

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L	T	P	C
-	-	3	1.5

17ACS02 COMPUTER PROGRAMMING LAB

Course 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 takeROMAN 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	3	1	-
CO2	3	-	2	1	-	-	-	-	-	-	-	-	1	1	-
CO3	-	2	2	3	-	-	-	-	-	-	-	-	1	3	-
CO4	-	2	-	2	-	-	-	-	-	-	-	-	3	3	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
3	1	-	3

17AHS09 NUMERICAL AND TRANSFORM TECHNIQUES

Course Outcomes:

After completion of the course the student will be able to

1. Apply interpolation to solve engineering problems
2. Apply numerical solutions to solve ordinary differential equations.
3. Apply Laplace transform techniques to solve engineering problems.
4. Analyze periodic functions using Fourier Transform.
5. Solve one dimensional and two dimensional problems using partial differential equations.

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.

REFERENCES:

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.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	1									
CO2	3	3	1	1								
CO3	2	1	2									
CO4	3	2	1									
CO5	3	2	1									

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – I Semester (Common to Civil Engineering, ME & AE) /

II Semester (Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
3	-	-	3

17AHS04 ENGINEERING CHEMISTRY

Course Outcomes:

After completion of the course the student will be able to

1. Explain the impact of hard water and removal of hardness of water by internal and external methods, desalination of Brackish water.
2. Select suitable engineering materials for specific applications.
3. Define Formation of corrosion, effect of corrosion and to design of corrosion resistant articles.
4. Select suitable fuels based on calorific value for a particular application, calculation of air requirements for combustion of fuel.
5. Construct the various types of batteries and applications of various 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, Dhanpat Rai 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., 12th edition, 2010.

Mapping of CO's- PO's-PSO's

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										
CO2	3	3										
CO3	3											
CO4	3	3										
CO5												

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech- II Semester (Common to All Branches)	**L**	**T**	**P**	**C**
	3	**-**	**-**	3

17ACS03 DATA STRUCTURES

Course 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 problembeing 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, Behrouz Forouzan, "Data Structures: A P seudocode Approach with C (Data Structures Series)", Second Edition, Cengage Learning, 2004.
2. Gav Pai, "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).

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO2	3	-	2	2	2	-	-	-	-	-	-	-	2	2	-
CO3	3	3	2	2	2	-	-	-	-	-	-	-	2	2	-
CO4	-	-	2	-	2	-	-	-	-	-	-	-	2	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I-B.Tech II Semester (Common to ECE, ETE, EEE, CSE, CSSE and IT)

L	T	P	C
3	1	-	3

17AEC01 ELECTRONIC DEVICES AND CIRCUITS

Course Outcomes:

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

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: Photoemissivity, 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, Mc Graw Hill Education, Fourth Edition, 2016.
2. S Salivahanan and N Suresh Kumar, Electronic Devices and Circuits, Mc Graw 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3									**3**		**1**
CO2	3	1	3										**3**	**2**	**1**
CO3	3	1	2	3									**3**	**3**	**1**
CO4	3	2	1										**3**	**3**	**1**
CO5	3	2	1										**3**	**1**	**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE04 ELECTRICAL CIRCUITS

Course Outcomes:

After Completion Of This Course, The Student Will Be Able To:

1. Apply Circuit Analysis Techniques In Electrical Circuits, Design Of Electrical Machines And Power SystemsAnalysis.
2. Apply The Circuit Concepts In Modeling Of Any Physical System And Performance For Steady State Analysis.
3. Analyze System Performance For Steady State Analysis.

UNIT - I

INTRODUCTION TO ELECTRICAL CIRCUITS: Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources-Source transformation – Voltage – Current relationship for passive elements - Kirchhoff's laws – Problems.

UNIT – II

NETWORK REDUCTION TECHNIQUES: Series, parallel, series- parallel, star-to-delta and delta-to-star transformation - Node analysis and Mesh analysis - concept of super node and super mesh for DC Circuits – Problems.

UNIT – III

MAGNETIC CIRCUITS: Magnetic Circuits – Faraday's laws of electromagnetic induction – Lenzs law, concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits – Problems.

UNIT - IV

SINGLE PHASE A.C CIRCUITS: R.M.S and Average values and form factor for different periodic wave forms, Steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation – Concept of Reactance, Impedance, Susceptance and Admittance – Phase and Phase difference – concept of power factor, Real and Reactive powers – J-notation, Complex and Polar forms of representation, Complex power – Introduction to Three phase AC Circuits – Problems.

UNIT – V

LOCUS DIAGRAMS AND RESONANCE: Locus diagrams – series R-L, R-C, R-L-C and parallel combination with variation of various parameters – Resonance – Series, parallel circuits, concept of band width and Q factor – problems.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. William Hayt and Jack E. Kimmerly: Engineering circuit analysis, Mc Graw Hill Company, 7th Edition, 2007.
2. Alexander and sadiku: Fundamentals of Electric circuits, Mc-graw Hill education, 6th edition, 2017

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	--	2	--	--	--	--	--	--	2	2	2
CO2	3	2	2	2	--	2	--	--	--	--	--	--	3	3	3
CO3	2	2	2	2	--	1	--	--	--	--	--	--	2	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE05 ELECTRICAL ENGINEERING MATERIALS

Course Outcomes:

After completion of the course a successful student will be able to

1. Apply basic properties of dielectrics, magnetic materials,
2. Apply properties of semiconductors, superconducting and Nano materials
3. Analyze characteristics of materials used for specific purpose.
4. Apply problem solving skills in engineering context.
5. Analyze the concepts of Engineering materials and properties

UNIT-I

CONDUCTING MATERIALS: Introduction – classification of materials – Metals and Non metals, physical, thermal, mechanical and electrical properties of materials – classification of electrical materials – concept of atom – electron configuration of atom, conductors, general properties of conductors, factors effecting resistivity of electrical materials – electrical/mechanical/thermal properties of copper, aluminum, iron, steel, lead, tin and their alloys – applications.

UNIT-II

DIELECTRIC MATERIALS AND HIGH RESISTIVITY MATERIALS: Introduction – solid, liquid and gaseous dielectrics, leakage current, permittivity, dielectric constant, dielectric loss – loss angle – loss constant, Breakdown voltage and dielectric strength of – solid, liquid and gaseous dielectrics, effect of break down– electrical and thermal effects ,Polarization – electric, ionic and dipolar polarization. Effect of temperature and Frequency on dielectric constant of polar dielectrics. High Resistivity materials – electrical / thermal / mechanical properties of Manganin, Constantan, Nichrome, Tungsten, Carbon and Graphite and their applications in electrical equipment.

UNIT- III

ELECTRICAL PROPERTIES OF MATERIALS: Introduction - Resistivity ratio - Variation of resistivity of alloys with temperature - Thermal conductivity of metals – Explanation for low

specific heat metals – Super conducting materials – Classification of conducting material – Difference in properties of hard drawn and annealed copper – Standard conductors – Materials for lamp filaments – Materials used for transmission lines – Electrical contact materials and their selection –Various kinds of capacitors – Materials for capacitors – High tension underground cables.

UNIT-IV

INSULATING MATERIALS: Introduction – characteristics of a good electrical insulating materials – classification of insulating materials – electrical, thermal, chemical and mechanical properties of solid insulating materials - Liquid insulating materials – Mineral oils, synthetic liquids, fluorinated liquids – their Electrical, thermal and chemical properties – transformer oil – properties – effect of moisture on insulation properties - Gaseous insulators – classification based on dielectric strength – dielectric loss, chemical stability properties and their applications .

UNIT- V

SPECIAL PURPOSE MATERIALS: Classification of polymers – Thermo plastic and thermo sets – Mechanical properties of polymers – Applications of polymers – Ceramic - Structure of ceramics – Electrical applications of ceramics – Refractory materials – super refractories - Organic semiconductor – Nano materials – Production of nano materials – Application of nano materials.

TEXT BOOKS:

1. R.K.Shukla, Archana: Electrical Engineering Materials, TATA MCGraw HILL education private limited, New Delhi, 1st Edition, 2012**.**
2. R.K.Rajput: A Course in Electrical Engineering Materials, University Science Press, 1st Edition, 2016.

REFERENCE BOOKS:

1. C.S. Indulkar and S. Thiruvengadam: An Introduction to electrical engineering materials, SChand & Company, 6th Edition, 2013.
2. S.P. Seth: A course in electrical engineering materials, Dhanapatrai & Sons, New Delhi, 3rd Edition, 2011.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	1	1	3	2	2	2	2	1	2	2	2	2
CO2	2	2	2	--	--	2	3	3	3	2	--	2	3	1	3
CO3	1	2	1	1	1	2	2	2	2	1	1	1	2	2	2
CO4	--	1	--	-	-	1	3	3	3	--	-	--	3	3	3
CO5	2	3	2	-	-	3	3	3	3	2	-	2	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – I Semester (Common to Civil Engineering, ME & AE) /

II Semester (Common to ECE, ETE, EE, EEE, CSE, IT, & CSSE)

L	T	P	C
-	-	3	1.5

17AHS06 ENGINEERING CHEMISTRY LAB

Course Outcomes:

After completion of practical student will be able to

1. Use volumetric analysis for the estimation of metal ions, hardness of water, and chlorides in water.
2. Demonstrate importance of viscosity index, flash point and fire point of lubricants.
3. 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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	**3**	**3**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**		**-**
CO3	**-**	**3**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
-	-	3	1.5

17ACS05 DATA STRUCTURES LAB

Course 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) Inorder b) Preorder c) Postorder

Week 13

Write a C program to implement the following graph traversals

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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	1	1	1	-	-	-	-	-	3	3	3	2	-
CO2	3	3	-	1	-	-	-	-	-	-	1	2	-	-	-
CO3	-	3	1	1	1	-	-	-	-	-	2	1	-	-	-
CO4	-		1	1	1	-	-	-	-	-	-	-	3	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech – I Semester (Common to Civil Engineering, ME & AE) /

II Semester (Common to ECE, ETE, EE, EEE, CSE, IT & CSSE)

L	T	P	C
-	-	2	1

17AME03 ENGINEERING PRACTICE LAB

Course Outcomes:

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

1. produce different prototypes in the carpentry trade such as Mortise and tendon joint, and Table stand using woodturning lathe.
2. Assess time in a Fitting trade such as Dove tail joint and Half Round joint.
3. Design basic prototypes in the trade of Tin smithy such as rectangular tray, and funnel.

1. TRADES FOR EXERCISES:

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, Saravana Pandian, 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	2	2	2	-
CO2	3	-	-	-	-	-	-	-	-	-	-	2	-	2	-
CO3	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech., II Semester (Common for all Branches)

L	T	P	C
-	-	-	-

17AHS10 QUANTITATIVE APTITUDE AND REASONING – I
(Common to all Branches)

Course 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:

Numbers

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

Decimal Fractions

Simplification

Square Roots & Cube Roots

Average

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

Problems on Numbers

Problems on Ages

Surds & Indices

Percentage

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

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.

Ratio and Proportion

Definition of Ration-Properties of Ratios-comparison of Ratios-Problem on Ratios-Compound Ratio-Problems of Proportion, Mean Proportional and continued Proportion.

Competency 2:

Partnership

Introduction-Relation between capitals, Period of investments and Shares

Chain Rule

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.

Time and Distance

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

Mixtures and Allegations

Problems on mixtures-Allegations rule-Problems on Allegation

Simple Interest

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

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.

Logarithms

Syllabus for Reasoning

Competency 3:

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

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

Binary Logic

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

Competency 4:

Number and letter series

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

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:

Coding and Decoding

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

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

Critical Reasoning

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

Lateral reasoning puzzle

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

TEXT BOOKS:

1. GL Barrons: 'Thorpe's Verbal reasoning', Tata MC Graw-Hills, LSAT Materials, 2015.
2. R S Agarwal: 'A modern approach to logical reasoning', S Chand Company Ltd 2002.

REFERENCE BOOKS:

1. Abhjit Guha: 'Quantitative Aptitude', Tata MC Graw Hills, 4th Edition, 2011.
2. R S Agarwal: 'Quantitative Aptitude', S Chand Company Ltd 2008.
3. G.L BARRONS: 'Quantitative Aptitude', Tata MC Graw Hills, 2014.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	-	2	-	3	3	-	-	-	-	-	-	-	2	1	2
CO2	-	-	-	3	-	-	-	-	-	-	-	-	-	-	2
CO3	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3		3	-	3	-	-	-	-	-	-	-	-	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech., II Semester (Common for all Branches) **L T P C**
- - - -

17AHS11 INTELLECTUAL PROPERTY RIGHTS

Course Outcomes:

After completion of the course the student will be able to

1. Develop skills in determination of trade secrets status.
2. Interpret New Developments in trade law.
3. Identify complexities involved in the process of attributing intellectual property rights
4. Identify legalities of intellectual property to avoid plagiarism and other IPR relates crimes like copyright, infringements, etc.
5. Apply fundamental principles for 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. Prabuddha Ganguli, "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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1										3	3	-
CO2	3	3	1	1									3	-	-
CO3	2	1	2										2	1	-
CO4	3	2	1										-	-	-
CO5	3	2	1										3	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

I B.Tech., II Semester (Common for all Branches)

L	T	P	C
-	-	-	-

17AHS12 CLINICAL PSYCHOLOGY

Course Outcomes:

After completion of the course the student will be able 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. interpret professional identity and practice as clinical psychologists through fundamental knowledge of psychology, commitment to professional ethics.
4. Use the concepts of multiculturalism, diversity and participation for 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.

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, Girishwar Misra, "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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	3	3	-	-	-				1	-	-	-
CO2	3	-	-	-	-	-	-	-				-	3	3	-
CO3	-	3	3	-	3	-	-	-				-	-	-	-
CO4	-	3	1	3	-	-	-	-				3	3	3	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

I B.Tech., II Semester (Common for all Branches)	**L**	**T**	**P**	**C**
	-	-	-	-

17AHS13 GERMAN LANGUAGE

Course Outcomes:

After completion of the course the student will be able to

1. Develop reading, writing, speaking, and listening skills with ever increasing proficiency and accuracy.

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 Nieder Deutschals Fremdsprache IA. Ausländer, "German Language", Perfect Paperback Publishers, 1st Edition, 1992.
2. Deutsch alsFremdsprache, IB, Erganzungskurs, "German Language", Front Cover. Klett, Glossar Deutsch-Spanisch Publishers, 1st Edition, 1981.

REFERENCE BOOKS:

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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	-	-	-	-	-	-	-	3	-	3	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to EEE and ECE)

L	T	P	C
3	1	-	3

17AHS14 SPECIAL FUNCTIONS & COMPLEX ANALYSIS

Course 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 interms 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 inthe stability criteria of linear systems.

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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 – Generalised 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 Graw hill 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											**3**		**3**
CO2	3	2	3										**3**		**3**
CO3	2	1	3										**3**	**2**	
CO4	1	1											**3**	**2**	
CO5	3												**3**		

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17ACE09 FLUID MECHANICS AND HYDRAULIC MACHINERY

Course Outcomes:

After completion of the course student will be able to

1. Apply pressure on surfaces and in pipes
2. Estimate frictional losses in a pipe when there is a flow between two places
3. Identify types of flow and its measurements and applications
4. Classify the turbines and design criteria based on water availability
5. Identify the suitable pump required for different purposes

UNIT-I

FLUID PROPERTIES AND STATICS: Dimensions and units - Definition of a fluid – Physical properties of fluids – Density, Specific weight, Specific volume, Specific gravity, Compressibility, Vapor pressure, Surface tension, Capillarity and Viscosity. Pascal's law – Pressure variation in a static fluid – Atmospheric, gauge and absolute pressures – Measurement of pressure – Piezometer – U–tube and inverted U–tube manometers – Bourdon's pressure gauge – Hydrostatic forces on plane surfaces– Buoyancy-Buoyant Force and Centre of Buoyancy-Metacentre and Metacentric Height- Stability of Submerged and Floating Bodies.

UNIT-II

FLUID KINEMATICS AND FLUID DYNAMICS: Types of flow, velocity field, one and two-dimensional flow analysis, circulation and vorticity, stream function and velocity potential function, potential flow, standard flow patterns, combination of flow patterns, flow net. Continuity equation, Euler's equation of motion, Bernoulli's equation, Impulse momentum equation and applications (pipe bend).

UNIT-III

PIPE FLOW: Reynolds's experiment – Reynolds's number - Minor losses in pipe flow - Darcy–Weisbach equation – Variation of friction Factor – Moody's chart – Pipes in series –Pipes in parallel.

FLOW MEASUREMENT: Velocity measurement by Pitot tube and Pitot static tube – Discharge measurement by Venturimeter and orifice meter – Turbine Flow meter.

UNIT-IV

Dimensional Analysis as a tool in design of experiments, identification of non dimensional numbers and their significance, dimensional analysis methods.

Boundary Layer Theory – Formation, growth and separation – Mathematical models for boundary layer flows.

UNIT-V

HYDRAULIC TURBINES: Elements of hydroelectric power plants- Heads and efficiencies of turbines – Classification of turbines –Pelton wheel-Modern Francis turbine – Kaplan turbine-Main components and working principle- Expressions for work done and efficiency – Working proportions and design of each.

CENTRIFUGAL PUMPS: Classification and types of pumps – Components and working of a centrifugal pump – Work done by the impeller– Heads and efficiencies – NPSH- Priming – Priming devices – Minimum starting speed – Multistage pumps – Pumps in series and parallel – Submersible pumps – Limiting suction head – Cavitation – Expression for specific speed.

TEXT BOOKS:

1. P.N. Modi & S.M. Seth, Hydraulics and Fluid Mechanics including Hydraulic Machines, New Delhi, Standard Book House, 14th Edition 2002.
2. R.K. Bansal, A Text book of Fluid Mechanics and Hydraulic machinery, Laxmi Publications (P) Ltd, 9th Edition, 2010.

REFERENCES:

1. Jagadish Lal, Hydraulic Machines, Metropolitan Book Company Pvt. Ltd, 9th Edition, 2003.
2. Nachleba, Hydraulic Turbines, New Delhi, Tata McGraw Hill Publishing Co.Ltd, 1st Edition, 2012.
3. Streeter & Wylie, Fluid Mechanics, T M H Publications, 10th Edition, 1997.
4. C.M. White, Fluid Mechanics, T M H Publications, 4th Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											**3**	**2**	
CO2	3	2	2										**3**	**2**	
CO3	3	2	2										**3**		
CO4	3	2											**3**		
CO5	2	3	1										2	1	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

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

L	T	P	C
3	-	-	3

17AMB01 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Outcomes:

After the completion of the course student will be able to

1. Describe concepts of managerial economics
2. Develop an understanding of economic principles and develop 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. Apply 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: Conceptof 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, TMH, 4th Edition, 2009.
2. Varshney R.L. and K.L. Maheswari, Managerial Economics, Sultan Chand & Sons, 19thEdition, 2009.
3. Siddiqui S.A. and Siddiqui A.S., Managerial Economics and Financial Analysis, NewAge international, 2009.

REFERENCES:

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

Mapping of CO's- PO's

Course Outcome	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1							2		2	1	3	
CO2		3	2	2							3	1
CO3							2		2		3	
CO4		3	2	2							3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to ECE & EEE)

L	T	P	C
3	1	-	3

17AEC04 SWITCHING THEORY AND LOGIC DESIGN

COURSE OUTCOMES:

After completion of the course 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, 2012.
2. Zvi Kohavi and Nirah K.Jha, Switching Theory and Finite Automata Theory, Cambridge, 3rd Edition, 2010.

REFERENCE BOOKS:

1. Subratha Goshal, Digital Electronics, Cambridge, 2nd Edition, 2012.
2. Comer, Digital & State Machine Design, OXFORD, 3rd Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		2	2									**3**	**1**	**1**
CO2	3	3	2	2									**3**	**1**	**1**
CO3	3	3	2	2									**3**	**1**	**1**
CO4	3	2	2	2									**3**	**1**	**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE07 NETWORK ANALYSIS AND SYNTHESIS

Course Outcomes:

After completion of the course student will be able to

1. Apply circuit analysis techniques in electrical machine design.
2. Apply the circuit concepts in modeling of any physical system.
3. Analyze the transient behavior of electrical circuits.
4. Apply the circuit analysis techniques in power system analysis.
5. Analyze the network analysis and concepts

UNIT - I

THREE PHASE CIRCUITS: Phase sequence – Star and delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of real and reactive power-Problems.

NETWORK TOPOLOGY: Basic Definitions – planar and non-planar networks - Graph – Tree, Basic cut-set and Basic Tie-set – incidence matrices for planar networks – Loop and Nodal methods of analysis of Networks with independent voltage and current sources - Duality & Dual networks.

UNIT - II

NETWORK THEOREMS (WITHOUT PROOF): Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's, Tellegen's and Compensation theorems for DC and AC excitations – Problems.

UNIT - III

TRANSIENT ANALYSIS: Transient response of R-L, R-C, R-L-C circuits (Series combinations only) for D.C. and sinusoidal excitations – Initial conditions - Solution using differential equation approach and Laplace transform methods. Response of RL, RC and RLC Series circuits for step function using Laplace Transform method-Problems.

UNIT - IV

NETWORK FUNCTIONS: Introduction Driving point impedance and admittance – voltage and current Transfer ratio-Concepts of Poles and Zeros in network functions – Problems.

TWO PORT NETWORK PARAMETERS: Concept of Two port network - Two port network parameters: Impedance (Z), Admittance (Y), Transmission (ABCD) and hybrid parameters (h) and their relationship – Conditions for symmetry and Reciprocity.

UNIT - V

NETWORK SYNTHESIS: Introductions- hurwitz polynomials - positive real functions - elementary synthesis concepts -realization of LC functions- realization of RC functions- realization of RL functions.

TEXT BOOKS:

1. M.E.Vanvalkenburg, Network Analysis, PHI, 3rd Edition, 2006.
2. William Hayt and Jack E. Kimmerly, Engineering circuit analysis, Mc Graw Hill Company, 8thedition, 2013.

REFERENCES BOOKS:

1. Ravish R.Singh, Network Analysis and Synthesis, Tata Mc-graw Hill Company, 2017.
2. Chakrabarti. A, Electrical Circuits Analysis & Synthesis, Dhanpat Rai & Co (P) Ltd, Delhi, 6th Edition, 2010.
3. Alexander and sadiku, Fundamentals of Electric circuits, Mc-graw Hill Company, 6th Edition, 2017.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	--	--	2	--	--	--	--	2	2	2
CO2	3	3	2	2	2	--	--	2	--	--	--	--	3	1	3
CO3	2	2	2	2	1	--	--	1	--	--	--	--	2	2	2
CO4	3	3	1	1	--	--	--	--	--	--	--	--	3	3	3
CO5	3	3	2	2	2	-	-	2	-	-	-	-	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE08 ELECTROMAGNETIC FIELDS

Course Outcomes:

After completion of the course student will be able to

1. Apply basic circuit techniques in electromagnetic static fields in power transmission lines.
2. Categorize the electrical parameters which are related to magnetic potential and time variant fields.
3. Apply basic laws of magneto static fields in electrical machines.
4. Relate the force and inductance of magnetic fields and time varying fields in transmission
5. Describe the fundamental laws of electromagnetic force, flux density and intensity

UNIT-I

ELECTROSTATICS: Electrostatic Fields – Coulomb's Law - Electric Field Intensity-EFI due to several charges- Work Done in Moving a Point Charge in Electrostatic Field- Electric Potential- Electric Potential due to several Charges – Potential Gradient – Electric flux density- Gauss's Law and its Application - Maxwell's First Law- Laplace's and Poisson's Equations - Solution of Laplace's Equation in one Variable.

UNIT-II

CONDUCTORS, DIELECTRICS AND CAPACITANCE*:* Electric Dipole - Dipole Moment – Potential and EFI due to Electric Dipole - Torque on an Electric Dipole in an Electric Field - Behavior of Conductors and dielectrics in an Electric Field - Polarization –Boundary Conditions –Capacitance-Capacitance of Parallel Plate, Coaxial and Spherical Capacitors. Energy Stored and Energy Density– Current Density – Conduction and Convection Current Densities – Ohm's Law in Point Form – Equation of Continuity.

UNIT-III

MAGNETO STATICS: Magnetic Fields – Relation Between Magnetic Flux , Magnetic Flux Density and MFI - Biot-Savart Law – Magnetic Field Intensity(MFI) due to a Straight Current Carrying Filament, Circular and Square Filament, Solenoid Current Carrying Wire– Maxwell's Second Equation. Ampere's Circuital Law and Its Applications– Maxwell's Third Equation. Magnetic Dipole and Dipole moment – A Differential Current Loop as a Magnetic Dipole –. Scalar and Vector Magnetic Potential and its Properties - Scalar Laplace equations, Vector Poisson's Equations.

UNIT-IV

MAGNETIC FORCE AND INDUCTANCE: Magnetic Force – Lorentz Force Equation – Force on Current Element in a Magnetic Field - Force on a Straight and Long Current Carrying Conductor - Force Between two Straight and Parallel Current Carrying Conductor – Torque on a Current Loop Placed in a Magnetic Field - Self and Mutual Inductances – Determination of Self Inductance of a Solenoid and Toroid - Mutual Inductance Between a Straight Long Wire and a Square Loop Wire in the Same Plane– Energy Stored and energy density in a Magnetic Field.

UNIT-V

TIME VARYING FIELDS: Faraday's Law of Electromagnetic Induction – It's Integral and Point Forms – Maxwell's Fourth Equation. Statically and Dynamically Induced E.M.F's – Displacement Current density - Modified Maxwell's Equations for Time Varying Fields – Poynting Theorem and Poynting Vector.

TEXT BOOKS:

1. Joseph Edminister, Electromagnetics, Tata Mc Graw Hill, 2006.
2. Sadiku, Electromagnetic Fields, Oxford University Press, 5th Edition, 2010.

REFERENCES:

1. William.H.Hayt, Engineering Electromagnetics, Mc.Graw – Hill, 2010.
2. K.A.Gangadhar, Electromagnetic Field Theory, Khanna Publications, 2009.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	--	--	1	1	--	--	--	--	--	3	2	1
CO2	3	2	1	--	--	1	1	--	--	--	--	--	2	2	-
CO3	3	2	1	--	--	2	2	--	--	--	--	--	3	2	-
CO4	3	3	1	--	--	1	2	--	--	--	--	--	3	2	2
CO5	3	3	2	-	-	2	1	-	-	-	-	-	3	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY, (AUTONOMOUS)

II-B.Tech I Semester (Common to ECE & EEE)

L	T	P	C
-	-	3	1.5

17AEC07 ELECTRONIC DEVICES AND CIRCUITS LAB

Course 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. Analyze various parameters from the characteristics of various electronic devices.
3. Analyze the importance of Filters and its calculations.
4. Analyze the bandwidth of the BJT and FET in different configurations.
5. Apply the different application in electronics devices

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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3									**3**		**2**
CO2	3	2	3										**3**	**3**	**2**
CO3	3	2	3	3									**3**	**3**	
CO4	3	3	2	2									**3**	**2**	
CO5	3	3	2	2									3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to EEE, ECE, CSE & IT)

II B.Tech – II Semester (Common to CE, ME & AE)

L	T	P	C
-	-	2	1

17AHS17 TECHNICAL WRITING AND CONTENT DEVELOPMENT LAB

Course Outcomes:

After completion of the course the Students will be able to

1. Use English fluently in communication by following LSRW.
2. Develop the art of oral presentation to develop leadership qualities.
3. Relate importance of English in the modern world Develop required skills to be employable.
4. Prepare for interviews confidently and improve the chances of getting a job.

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: Impromptu speech development on a given topic, public speaking

UNIT – III

PRESENTATIONS: Importance of presentations- developing and organizing the presentations- Verbal and visual support in presentations- using body language – how to make it effective- delivering the presentation.

UNIT – IV

REPORT WRITING: Business and Technical Reports- Technical Report writing-strategies, Types of Reports- formats of reports

UNIT – V

INFORMATION TRANSFER: Importance – Data Interpretation

MINIMUM REQUIREMENT FOR ELCS LAB:

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

- K-Van Advanced Communication Skills
- Lingua TOEFL CBT Insider, by Dreamtech
- Cambridge Advanced Learners' English Dictionary with CD.
- Oxford Advanced Learner's Compass, 8th Edition

REFERENCE BOOKS:

1. Meenakshi Raman – Technical Communication, Oxford University Press, New Delhi, 2nd Edition, 2012.
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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											**3**		**1**
CO2	2	1											**3**	**2**	**1**
CO3	1													**2**	**1**
CO4	2														**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE09 ELECTRICAL CIRCUITS LAB

Course Outcomes:

After completion of the course student will be able to

1. Analyze the concept of two port networks and analysis of Z, Y and ABCD parameters.
2. Relate the knowledge about the phenomenon of resonance in RLC circuits.
3. Describe the locus diagrams of RL and RC series circuits.
4. Determine the self, mutual inductance and co-efficient of coupling for pair of coils.
5. Apply the concept and principles of Electrical parameters

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Verification of Superposition & Reciprocity theorems.
2. Verification of Thevenin's & Norton`s theorems.
3. Verification of Maximum power transfer theorem.
4. Verification of Compensation & Millmann's theorems.
5. Determination of self, Mutual inductance & Coefficient of coupling of pair of inductive coils.
6. Series & Parallel Resonance in RLC Network. Determination of Timing and Resonant frequency, Bandwidth and Q Factor of circuit
7. Measurement of power in three phase by two wattmeter method for unbalanced star connected load
8. Determination of Impedance & Admittance Parameters in Two Port Network
9. Time response of First order RC/RL series Network for periodic non sinusoidal inputs. Determination of Time constant and steady state error
10. Measurement of active power in three phase circuit with Star and Delta connected balanced loads
11. Determination of Transmission (ABCD) and Hybrid Parameters (h) in two port network
12. Current Locus diagram in RL and RC series circuit with variable R and C

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	2	2	2	2	--	2	2	2	2	2
CO2	2	2	2	--	3	2	3	2	3	--	3	3	3	1	3
CO3	2	1	1	1	2	2	2	2	2	--	2	2	2	2	1
CO4	1	--	--	-	3	1	3	1	3	--	3	3	3	3	1
CO5	3	2	2	-	3	2	3	2	3	-	3	3	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to EEE, ECE, CSE & IT)
II B.Tech – II Semester (Common to CE, ME & AE)

L	T	P	C
-	-	-	-

17AHS18 ENGLISH FOR COMMUNICATION–II

Course Outcomes:

After completion of the course student will be able to

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 cultivate skills for societal service and inculcate passion for work.

UNIT – I

COMMUNICATION: Importance and need of communication-Types of communication-Barriers of communication.

UNIT –II

VOCABULARY BUILDING- Synonyms & Antonyms, Root Words- homonyms, homophones, homographs - words often confused- one word substitutions-common errors.

UNIT –III

TELEPHONIC COMMUNICATION- Handling calls - leaving messages- useful phrases-asking for and giving information.

UNIT –IV

READING COMPREHENSION- Techniques for good comprehension- Reading for specific details and Information- Skimming-Scanning- Intensive Reading- extensive reading-non-verbal signals.

UNIT –V

WRITTEN COMMUNICATION: principles and fundamentals of E-Mail- Advantages of

E-mail, E-mail drafting.

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 Press.2012.
2. A Course in Communication Skills- Kiranmai Dutt & co. Foundation Books, 2012.
3. Meenakshi Raman – Technical Communication, Oxford University Press, New Delhi, 2nd Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3											**3**	**2**	**2**
CO2	3	3	2										**3**	**2**	**2**
CO3	3		2										**3**	**2**	**2**
CO4	3	2	3										**3**	**2**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

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

L	T	P	C
-	-	-	-

17AME64 INTRODUCTION TO ENGINEERING PROJECTS
(Activity based course)

Lecture / Activity: 2/ Week

Int. Max Marks: 40
Ext. Max Marks: 60

Course Outcomes:

After completion of the course 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 driving technological 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. Saeed Moaveni, "Engineering Fundamentals: an Introduction to Engineering", Cengage Learning, printed in USA.
3. Reymond B Landis, "Studying Engineering: A Road Map to rewarding career", Discovery press.

OOKS:

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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO2	3	3							3			3	**3**		
CO3	3	3							3			3	**3**		
CO4	3	3							3			3	**3**		
CO5	3	3							3			3	**3**		
CO6	3	3							3			3	**3**		
CO7	3	3							3			3	**3**		
CO8	3	3							3			3	**3**		

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE12 DC MACHINES AND TRANSFORMERS

Course Outcomes:

After completion of the course a successful student will be able to

1. Relate the working principle of DC machines and Single phase and three phase Transformers.
2. Interpret the DC & AC machines properties and application in the domestic, industrial and power systems.
3. Analyze the DC machines and Single phase and three phase Transformers and its performance Characteristics with and without loads by conducting a suitable test.
4. Practice the EMF equation & Back EMF, Equivalent circuits, regulation and phasor diagram for different load condition.
5. Develop or progress a armature winding and end connection of a DC machines.

UNIT - I

D.C MACHINES: Constructional features - Principle of operation - Armature windings - E.M.F Equation - Armature reaction - Cross-magnetizing and de-magnetizing AT/pole – Commutation – Problems.

UNIT - II

D.C GENERATORS & MOTORS: Types of Generators -Characteristics of Generators – Magnetization Characteristics –Determination of Critical field resistance and critical speed - Load characteristics of generators – Applications.

D.C MOTORS: Operation of 3-point and 4-point starters - Principle of operation of DC Motor – Types of DC Motors - Back E.M.F - Torque equation - characteristics and ratings and its applications of motors - Speed control of D.C. Motors – Applications.

UNIT - III

TESTING OF D.C. MACHINES: Testing of D.C machines Losses - Constant & Variable losses -Calculation of efficiency - Condition for maximum efficiency - brake test - Swinburne's test - Hopkinson test - Field's test.

UNIT - IV

SINGLE PHASE TRANSFORMERS & IT'S TESTING: Types - constructional details - EMF equation – operation on no-load and on-load - Phasor diagrams - Equivalent circuit - losses and efficiency – Regulation - All day efficiency - Effect of variations of frequency & supply

voltage on iron losses. OC and SC tests – Determination of Equivalent circuit parameters - Predetermination of efficiency and regulation - Separation of losses - Sumpner's test - Parallel operation with equal and unequal voltage ratios- Nature of cooling.

UNIT - V

THREE PHASE TRANSFORMERS: Three phase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ-Third harmonics in phase voltages - Three winding transformers - Tertiary windings – Scott connection - Auto transformers - Principle of operation - Equivalent circuit - comparison with two winding transformers.

TEXT BOOKS:

1. Bimbra.P.S, Electrical Machinery, Khanna Publishers, 7th Edition, 2011.
2. J.B.Gupta, Theory and Performance of Electrical Machine, S.K.Kataria & Sons Publishers, 1st Edition, 2013.

REFERENCES:

1. Nagrath.I.J & Kothari.D.P, Electric Machines, Tata Mc Graw-Hill Publishers, 4th Edition, 2010.
2. Kamakshaiah.S, Electromechanics-I, Overseas Publishers Pvt. Ltd., 2004
3. A.E.Clayton & N.H.Hancock, The Performance and Design of D.C Machines, CBS Publishers, 1st Edition, 2004.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	1	--	--	1	3	3	2	2	2	3	3	2	3
CO2	1	2	1	--	--	1	2	2	3	3	3	3	3	2	2
CO3	2	2	2	--	--	2	3	3	3	3	3	3	3	3	2
CO4	2	3	2	-	-	3	3	3	3	2	2	2	2	2	3
CO5	1	2	2	-	-	1	3	3	3	2	2	2	3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE13 GENERATION OF ELECTRICAL POWER

Course Outcomes:

After completion of the course student will be able to

1. Apply the concepts and phenomenon of different sources of Power Generation
2. Analyze in detail working process and description of components for different power generating stations.
3. Define terms and factors associated with load on power plants
4. Illustrate the cost of electrical energy with different Tariff methods.
5. Choose the different types of power plant according the demand

UNIT-I

BASICS OF POWER GENERATION: Introduction-Importance of electrical energy-Generation of electrical energy-Sources of energy-Conventional and Non conventional energy sources (Wind & Solar) -Comparison-Advantages and disadvantages.

UNIT-II

HYDRO ELECTRIC POWER STATION: Working principle-selection of site-schematic arrangement of Hydro Electric Power Station-Description of components-Classification of Hydro Electric Power Station-Low, Medium and High head Power Stations

UNIT-III

THERMAL POWER STATION: Working principle-selection of site-schematic arrangement of Thermal Power Station - Description of equipments of TPS

UNIT-IV

NUCLEAR POWER STATION: Working principle-selection of site-schematic arrangement of Nuclear Power Station-Description of equipments of NPS - Types of Nuclear reactors-BWR, PWR, FBR

UNIT-V

LOADS AND ECONOMICS OF POWER GENERATION: Load on power station-different types of Loads-Definitions: Load factor, Demand Factor, Diversity Factor, Plant capacity factor-Load and Load duration curve-Numerical problems. Cost of generation-Tariff-Characteristics-Types of Tariffs-Numerical problems

TEXT BOOKS:

1. Soni.M.L, Gupta.P.V, Bhatnagar.U.S and Chakraborti.A, A Text Book on Power Systems Engineering, Dhanpat Rai & Co.Pvt.Ltd., 2nd Edition, 2009.
2. Mehta.V.K and Rohit Mehta, Principles of power systems, S.Chand & Company Ltd, New Delhi, Revised Edition, 2005.

REFERENCES:

1. Singh.S.N, Electrical power Generation Transmission and Distribution, PHI, 2nd Edition, 2004.
2. Rai.G.D, Non Conventional energy sources, Khanna Publishers, 5th Edition, 2010.
3. Rajput.R.K, Power systems Engineering, Laxmi Publishers, 1st Edition, 2006.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	--	--	--	--	2	--	--	2	2	2
CO2	3	2	2	2	2	--	--	--	--	2	--	--	3	1	3
CO3	2	2	2	2	1	--	--	--	--	1	--	--	2	2	2
CO4	3	1	1	1	--	--	--	--	--	--	--	--	3	3	3
CO5	3	3	3	3	2	-	-	-	-	2	-	-	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (Common to ECE & EEE)

L	T	P	C
3	1	-	3

17AEC03 SIGNALS & SYSTEMS

Course Outcomes:

After completion of the course student will be able to

1. Apply concepts to qualify and quantify signals and systems.
2. Analyse signals & systems using time domain & frequency domain methods.
3. Explain concept of ROC in Laplace and Z-transforms.
4. Describe various transform techniques in the analysis of signals and systems
   .

UNIT-I

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. Concepts of Impulse function, Unit step function, Signum function, etc.

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

UNIT-II

FOURIER TRANSFORMS: Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms.

LAPLACE TRANSFORMS: Review of Laplace transforms(L.T), Partial fraction expansion, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's, Inverse Laplace transform, Relation between L.T's and F.T. of a signal.

UNIT-III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, Linear Time Invariant (LTI) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

UNIT-IV

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between autocorrelation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT-V

SAMPLING: Sampling theorem - Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling - Aliasing.

Z-TRANSFORMS: Concept of Z- Transform of a discrete sequence. Region of convergence, properties of Z-transforms, Inverse Z-transform-Long Division method, partial fraction method, convolution method.

TEXT BOOKS

1. B.P. Lathi, Signals, Systems & Communications, BS Publications, 2009.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, Signals and Systems, PHI, 2nd Edition, 1997
3. Simon Haykin and Van Veen, Signals & Systems, Wiley, 2nd Edition, 2002.

REFERENCES

1. A.Anandkumar, Signals and Systems, PHI, 2nd Edition, 2014.
2. Ramakrishna Rao, Signals and Systems, TMH, 2008.
3. B.P.Lathi, Linear Systems and Signals, Oxford University Press, 2nd Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2		2								1	**3**	**3**	**2**
CO2	3	2		2								1	**3**	**3**	**2**
CO3	3	2		2								1	**3**	**3**	**2**
CO4	3	2		2								1	**3**	**3**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEC12 ANALOG AND DIGITAL ELECTRONIC CIRCUITS

Course Outcomes:

After completion of the course student will be able to

1. Design Wave Shaping Circuits.
2. Design and Analyze Multi vibrator Circuits for different applications.
3. Acquire basic concepts in the design of linear integrated circuits and their applications.
4. Design various combinational logic circuits and sequential logic circuits
5. Demonstrate the concepts analog and digital Electronics circuits

UNIT-I

LINEAR & NON-LINEAR WAVESHAPING-CLIPPERS & CLAMPERS: High Pass, Low Pass RC circuits and their response for Sinusoidal, Step, Pulse, Square and Ramp inputs. Diodes Clippers, Transistor Clipper, Clipping at two independent levels, Transfer Characteristics of Clippers, Clamping operation, Clamping circuits using diode with different inputs, Practical Clamping circuits.

UNIT –II

SWITCHING CHARACTERSTICS OF DEVICES & MULTIVIBRATORS: Transistor as a Switch, Saturation parameters of Transistors and their variations with temperature, Transistor Switching Times. Analysis and Design of Bistable, Monostable, AstableMultivibrators and Schmitt trigger using transistors.

UNIT–III

LINEAR & NON-LINEAR APPLICATIONS OF OP-AMPS: Integrated Circuits, Types, Classification, Package Types and Temperature Ranges, Block Diagram of Op-Amp, Ideal and Practical Op-Amp Specifications,DC and AC Characteristics Op-Amp, 741 Op-Amp &its features.Inverting and Non Inverting Amplifiers, Difference Amplifier, Integrator and Differentiator, Buffers, Comparators, and Square Wave Generators, Introduction to 555 Timer, Functional diagram.

UNIT–IV

CMOS LOGIC: Introduction to Logic Families, CMOS Logic, CMOS Steady State Electrical

Behavior, CMOS Dynamic Electrical Behavior and CMOS Logic Families.

UNIT–V

COMBINATIONAL & SEQUENTIAL LOGIC DESIGN: Adders, Subtractors, Decoders, Encoders, Multiplexers, Demultiplexers, EX-OR gates, Parity Circuits and Comparators. Latches, Flip-Flops and their VHDL models.

TEXT BOOKS:

1. Anand Kumar, Pulse & Digital Circuits, PHI Publication, 2nd Edition, 2009.
2. D.Roy Chowdhury, Linear Integrated Circuits, New Age International (p) Ltd, 2nd Edition, 2003.
3. John F.Wakerly, Digital Design principles & Practices, PHI/Pearson Education Asia, 3rd Edition, 2005.

REFERENCES:

1. Millman.JHalkias.C, Integrated Electronics, Tata Mc-graw Hill Edition, 2008.
2. A.Gayakwad Ramakanth, Op-Amps & Linear ICs, PHI, 4th Edition, 2009.
3. H.Roth.Jr, Digital System Design using VHDL, Charles Cengage Publications, 2nd Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	--	--	--	--	--	--	--	2	2	1
CO2	3	2	3	2	2	--	1	--	--	1	--	--	3	1	3
CO3	2	2	1	1	2	1	--	--	--	2	--	--	2	2	1
CO4	3	1	--	-	2	--	--	1	--	1	--	--	3	3	1
CO5	3	3	2	-	1	-	-	--	-	2	-	1	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (Common to EEE & ECE)

L	T	P	C
3	1	-	3

17AEE14 CONTROL SYSTEMS

Course Outcomes:

After completion of the course student will be able to

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

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 - 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.

TEXT BOOKS:

1. I. J. Nagrath and M. Gopal, Control Systems Engineering, New Age International (P) Limited, 5th edition, 2007.
2. B.C.Kuo and Farid Golnaraghi, Automatic Control Systems, Prentice Halls, 9th Edition, 2014.

REFERENCE BOOKS:

1. K. Ogata, Modern Control Engineering, Prentice Hall of India, 4th edition, 2006.
2. A. Anand kumar, Control Systems, PHI learning Pvt Ltd., 2nd edition, 2014.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3		-	3	-	-	-	-	-	3	3	2
CO2	2	3	2	3	-	-	3	-	-	-	-	-	3	3	2
CO3	3	2	1	3	-	-	3	-	-	-	-	-	3	1	1
CO4	3	3	1	2	-	-	2	-	-	-	-	-	2	3	2
CO5	3	3	1	3	-	-	3	-	-	-	-	-	3	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE15 ELECTRICAL AND ELECTRONICS MEASUREMENTS

COURSE OUTCOMES:

After completion of the course student will be able to

1. Demonstrate knowledge on Calibration of various measuring instruments and measurement of various electrical quantities.
2. Analyze various types of DC and AC bridges.
3. Design for extension of meter ranges of various measuring instruments.
4. Apply various electrical and electronics measuring instruments and their applications.
5. Compare the parameters of all meters by testing and calibrations

UNIT-I

MEASURING INSTRUMENTS: Classification – deflecting, controlling and damping systems ,Ammeters and Voltmeters – PMMC, Dynamometer, moving iron type instruments – Expression for the deflecting torque and control torque – Errors and compensation - Extension of range using shunt and series resistance – Introduction to Digital meters.

UNIT-II

INSTRUMENT TRANSFORMERS AND P.F METER AND MEASUREMENT OF POWER & ENERGY : Current Transformers and Potential Transformers – Ratio and phase angle errors – Design considerations - Types of Power Factor Meters – Dynamometer and moving iron type – 1-Φ and 3-Φ meters, Rotating field and alternating field types-Frequency Meters- Single phase and three phase dynamometer wattmeter - LPF and UPF - Double element and three element Dynamometer wattmeter - Expression for Deflecting and control torques – Single phase and three phase Induction type Energy Meter –Errors and compensation.

UNIT-III

POTENTIOMETERS and MAGNETIC MEASUREMENTS: Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage and power - A.C. Potentiometers: Polar and coordinate types - Standardization-Ballistic galvanometer – Equation of motion – Flux meter – Constructional details-Comparison with Ballistic Galvanometer - Determination of B-H Curve - Method of reversals – step by step method - A.C. testing, CRT and CRO-DSO.

UNIT-IV

D.C & A.C BRIDGES: Measurement of low, medium and high resistances – Kelvin's double bridge - Whetstone's bridge, Sensitivity – Loss of charge method - measurement of inductance - Maxwell's bridge, Anderson's bridge - Measurement of capacitance - Desauty bridge, Schering Bridge– Wien's Bridge.

UNIT-V

TRANSDUCERS &MEASUREMENT OF NON-ELECTRICAL QUANTITIES: Classification of transducers - Advantages -Characteristics and choice of transducers – Principle of operation resistor, inductor, LVDT and capacitor transducers - LVDT Applications - Strain gauge – Principle of operation - gauge factor – Thermistors – Thermocouples – Synchros, Piezo electric transducers – photovoltaic – photo conductive cells, photo diodes – Hall effect – Current and voltage sensors.

TEXT BOOKS:

1. Sawhney.A.K, Electrical & Electronic Measurement & Instruments, Dhanpat Rai & Co.Publications, 2015.
2. Golding.E.W and Widdis.F.C, Electrical Measurements and Instrumentation, Reem Publications, 5th Edition, 1993.

REFERENCE BOOKS:

1. R. K. Rajput, Electrical & Electronic Measurement & Instrumentation, S. Chand & Co, 2nd Edition, 2008.
2. Reissland, M.U, Electrical Measurements: Fundamentals, Concepts, Applications, New Age International (P) Limited, Publishers, 2006.
3. Murthy.D.V.S, Transducers and Instrumentation, Prentice – Hall of India, 2nd Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3	2	-	2	2	2	2	2	2	3	1	2
CO2	2	3	3	1	1	-	1	1	1	1	1	1	2	2	1
CO3	3	3	3	3	1	-	1	1	1	1	1	1	3	1	1
CO4	3	2	1	3	2	-	2	2	2	2	2	2	3	1	1
CO5	3	3	3	1	1	-	1	1	1	1	1	1	3	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEC17 ANALOG AND DIGITAL CIRCUITS LAB

Course Outcomes:

After completion of the course student will be able to

1. Analyze sinusoidal and non-sinusoidal signals.
2. Design and analyze various multivibrator circuits.
3. Demonstrate of basic logic gates and design applications.
4. Select Skills in the design of combinational and sequential circuits.
5. Optimize the analog and digital circuits by analyze the concepts

LIST OF EXPERIMENTS

Experiments to be conducted Six from each part:

ANALOG ELECTRONICS LAB (PART-A):

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clamper's.
4. Transistor as a switch.
5. Astable Multivibrator.
6. Mono-stable Multivibrator.
7. Bi-stable Multivibrator.
8. Schmitt Trigger.

DIGITAL ELECTRONICS LAB (PART-B):

1. Study of Logic Gates & Some applications.
2. Half adder & Full adder.
3. Half Subtractor and full subtractor
4. 3-8 decoder-74X138
5. 8-3 encoder-74X148.
6. 8X1 multiplexer-74X151
7. 2X4 de-multiplexer-74X155
8. 4-bit comparator-74X85

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1										**3**	
CO2	3	2	1	1									**3**	**3**	**2**
CO3	3	2	1	1									**3**	**2**	**2**
CO4	3	2	1	1									**2**	**2**	
CO5	3	2	1	1									**1**	**3**	**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
-	-	2	1

17AEE16 ELECTRICAL MEASUREMENTS LAB

Course Outcomes:

After completion of the course student will be able to

1. Demonstrate knowledge on calibration of measuring instruments.
2. Analyze various bridges for measurement of resistance, inductance and capacitance.
3. Establish skills and methods in measurement of power and energy.
4. Use of different measuring instruments in the field of electrical engineering.
5. Categorize the different types of meters and calculate the calibrations

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter.
2. Measurement of % ratio error and phase angle error of given C.T by comparison.
3. Resistance strain gauge and LVDT- Calibration and measurement of Resistance & Capacitance.
4. Calibration and testing of single phase energy meter (Analog & Digital).
5. Kelvin's double Bridge & Wheat stone's bridge - Measurement of low & medium resistance.
6. Schering Bridge & Anderson bridge-Measurement of capacitance & inductance.
7. Measurement of 3 phase power using Two watt meter method (Balanced).
8. Characteristics of Thermistor, Thermo couple and Piezo Electric Transducers.
9. Calibration of dynamometer type power factor meter.
10. Polar curve using LUX meter- Measurement of intensity of illumination.
11. Measurement of dielectric strength of air and oil using H.T. testing Kit.
12. Calibration of LPF wattmeter – by Phantom testing

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	3	3	2	-	-	3	3	3	2	2	3	3	2	1
CO2	1	3	2	1	-	-	3	3	2	2	2	3	3	3	1
CO3	1	3	3	1	-	-	3	3	2	2	2	3	1	3	1
CO4	1	3	3	3	-	-	1	2	-	3	3	3	3	1	1
CO5	3	1	3	3	1	1	3	3	1	1	1	1	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE17 DC MACHINES AND TRANSFORMERS LAB

Course Outcomes:

After completion of the course student will be able to

1. explain magnetic characteristic if DC machines and obtain experimentally.
2. define internal and External Characteristics of DC motor and motors and generators.
3. Determine the performance of a Transformers.
4. Determine equivalent circuit parameters of single phase transformer and also predetermine the efficiency of transformer.
5. use concepts of conversion of three phase to two single phase supply using scott connected transformers.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Magnetization characteristics (O.C.C) of DC shunt generator-Determination of critical field resistance and critical speed.
2. Load test on DC series generator- External characteristics of generator
3. Load test on DC compound generator –Determination of performance curves.
4. Swinburne's tests on DC shunt motor – Predetermination of efficiency as generator and motor.
5. Brake test on dc shunt motor - Determination of performance curves.
6. Speed control of DC machine - Armature voltage control- Field control
7. Hopkinson's test
8. Field's test on dc series motor-Determination of efficiency
9. OC and SC test on Single phase Transformer- Determination of equivalent circuit parameters and predetermination of efficiency and regulation.
10. Sumpner's Test on a pair of single phase transformers- Determination of efficiency.
11. Conversion of three-phase to two single phase supply using Scott connection of transformer.
12. Parallel operation of two single phase transformers.
13. Brake test on dc Series motor - Determination of performance curves.
14. Brake test on dc compound motor.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	1	-	-	3	2	3	3	2	3	3	3	1
CO2	2	3	-	1	-	-	3	3	3	3	3	3	3	3	1
CO3	2	3	-	1	-	-	3	3	3	3	3	3	1	3	1
CO4	3	3	-	3	-	-	1	-	3	3	2	3	3	3	3
CO5	3	1	1	3	1	1	3	1	1	3	1	1	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – II Semester (Common to All Branches)

L	T	P	C
-	-	-	-

17AME65 ENGINEERING PROJECTS IN COMMUNITY SERVICE
(Activity based course)

Lecture / Activity: 2/ Week

Int. Max Marks: 40
Ext. Max Marks:60

Course 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 social ethics in engineering

UNIT - I

Project Survey 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 development Sessions - Different kinds of design thinking and its challenges, overall understanding of design processes.

UNIT – III

Design Skill 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.

TEXT BOOKS:

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, Jörg Feldhusen, Karl-Heinrich Grote ,ISBN: 978-1-84628-318-5 (Print) 978-1-84628-319-2

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	-	-	-	-	-	-	2	3	1
CO2	2	2	2	1	-	1	-	-	-	-	-	-	3	1	1
CO3	2	1	3	1	-	-	-	-	-	-	-	-	1	1	1
CO4	3	3	-	1	-	-	-	-	-	-	-	-	3	1	3
CO5	3	1	1	3	1	1	-	-	-	-	-	-	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to CE, ME & AE)
II B.Tech – II Semester (Common to EEE, ECE, CSE & IT)

L	T	P	C
-	-	-	-

17AHS19 QUANTITATIVE APTITUDE AND REASONING – II

(Audit Course – II)

Course Outcomes:

After completion of the course the student will be able to

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

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, 22nd Edition, 2017.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		3										**3**	**3**	
CO2	3	3	3										**3**	**2**	**3**
CO3	3	3	2										**3**	**3**	**2**
CO4	3	2											**3**		**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to CE, ME & AE)
II B.Tech – II Semester (Common to EEE, ECE, CSE & IT)

L	T	P	C
-	-	-	-

17AHS20 LEGAL SCIENCES

(Audit Course – II)

Course Outcomes:

After completion of the course 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3										**3**		**2**
CO2	3	2	1										**3**	**3**	**2**
CO3	3	2											**3**	**1**	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to CE, ME & AE)
II B.Tech – II Semester (Common to EEE, ECE, CSE & IT)

L	T	P	C
-	-	-	-

17AHS21 GENDER SENSITIVITY

(Audit Course – II)

Course Outcomes

After completion of the course student will be able to

1. Explain 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.

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. Gender, "How Gender Inequality Persists in the Modern World", Oxford University Press, Reprinted Edition, 2011.
2. William M Johnson, "Recent Reference Books in Religion", Duke University Publications, Reprinted Edition, 2014.

REFERENCE BOOKS:

1. Alolajis. Mustapha, Sara Mils, "Gender Representation in Learning Materials", Pearson Publications, 1st Edition, 2015.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	2	-	-	-	3	-	-
CO2	3	2	-	-	-	3	-	-	-	3	-	-
CO3	3	3	-	-	-	3	-	-	-	3	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

II B.Tech – I Semester (Common to CE, ME & AE)
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L	T	P	C
-	-	-	-

17AHS22 FRENCH LANGUAGE

(Audit Course – II)

Course Outcomes

After completion of the course 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.

Mapping of CO's- PO's

Course Outcome	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	1	-	-	-	-	1	-	-	-	3	-	-
CO2	1	-	-	-	-	2	-	-	-	3	-	-
CO3	2	-	-	-	-	2	-	-	-	3	-	-
CO4	1	1	-	-	-	1	-	-	-	3	-	-
CO5	2	2	-	-	-	2	-	-	-	3	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (Common to ECE, EEE, CSE & IT)

L	T	P	C
3	-	-	3

17AMB02 MANAGEMENT SCIENCE

Course Outcomes

After completion of the course student will be able to

1. Apply various areas of functional management for the prospects of business organization.
2. Apply management principles for decision making.
3. Handle intricacies of projects efficiently.
4. Use tools and techniques to become an effective manager.
5. 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, 4th Edition, 2009.
2. Stoner, Freeman, Gilbert, Management, Pearson Education, New Delhi, 6th Edition, 2004.
3. PannerSelvem, Production and Operations Management, Prentice Hall of India, 3rd Edition, 2012.

REFERENCE BOOKS:

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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1									3		3	
CO2									3		3	
CO3									2			
CO4									3		3	
CO5											3	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE18 INDUCTION AND SYNCHRONOUS MACHINES

Course Outcomes

After completion of the course student will be able to

1. define Working principle and construction of Induction motors and Synchronous machines.
2. Explain voltage regulation of synchronous generator with different loaded conditions.
3. Apply Gain speed control methods to control the induction motor and select suitable machine to meet specific application requirement.
4. Analyze the performance characteristics of induction motor and synchronous machine under no load and load conditions by conducting Suitable test.
5. Develop armature winding for three phase Synchronous Generator.

UNIT - I

THREE PHASE INDUCTION MOTORS: Construction details of squirrel cage and wound rotor Induction motors - principle of operation - Rotor EMF and rotor frequency - Rotor Reactance - Rotor Current - Power factor at standstill and running condition - Equivalent circuit - Phasor diagram - Torque equation - Torque slip characteristics - Rotor power input - Rotor copper loss and mechanical power developed - Expressions for maximum torque and starting torque - Crawling and Cogging.

UNIT - II

TESTING AND SPEED CONTROL OF INDUCTION MOTORS: No load and Blocked rotor tests - Construction of Circle diagram - Predetermination of performance characteristics - Methods of starting - Calculation of starting current and torque - Methods of speed control - Change of frequency - Pole changing - Injection of an EMF into rotor circuit (qualitative treatment only) - Induction Generator - Principle of operation.

UNIT - III

SYNCHRONOUS GENERATOR: Constructional features of round rotor and salient pole machines – Armature windings – Integral slot and fractional slot windings - Distributed and concentrated windings – Distribution, pitch and winding factors – E.M.F Equation – Characteristics - OCC & SC Test - Harmonics – Armature reaction - Leakage reactance – Synchronous reactance and Impedance – Experimental Determination - Phasor diagram – Load

characteristics – Ratings and its applications.

UNIT- IV

REGULATION OF SYNCHRONOUS GENERATOR: Synchronous impedance method - M.M.F method - Z.P.F method and A.S.A methods – Salient-pole alternators – Two reaction analysis – Experimental Determination of Xd and Xq (Slip test) - Phasor diagrams – Regulation of Salient pole alternators. Synchronizing alternators with infinite bus bars – Synchronizing power, Torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input – Introduction to cooling methods.

UNIT- V

SYNCHRONOUS MOTORS: Principle Of Operation - Phasor diagram – Characteristics of Synchronous Motors - Variation of current and power factor with excitation – V and Inverted V Curves - Power developed – Synchronous Condenser - Hunting and its suppression – Methods of starting.

SINGLE PHASE MOTORS: Constructional features - Double revolving field theory – Elementary idea of cross-field theory –A.C. Series motor-Universal motor –AC Servo motor - stepper motor.

TEXT BOOKS:

1. Nagrath.I.J & Kothari.D.P, Electric Machines, Tata Mc Graw-Hill Publishers, 4th Edition, 2010.
2. Bimbra.P.S, Electrical Machinery, Khanna Publishers, 7th Edition, 2011.

REFERENCES:

1. Alexander S Langsdorf, Theory of Alternating Current Machinery, Tata Mc Graw-Hill, 2nd Edition, 1984.
2. Fitzgerald.A.E, Kingsley.C and Umans.S, Electric Machinery, Mc Graw-Hill Companies, 5th Edition, 1990.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3	1	3	-	-	-	-	-	-	3	3	2
CO2	3	3	1	3	2	3	-	-	-	-	-	-	3	3	2
CO3	3	3	1	2	1	2	-	-	-	-	-	-	3	2	2
CO4	3	3	1	3	2	3	-	-	-	-	-	-	3	3	3
CO5	2	3	2	3	2	3	-	-	-	-	-	-	3	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech - I Semester(Common to ECE & EEE)

L	T	P	C
3	-	-	3

17AEC21 MICROPROCESSORS AND MICROCONTROLLERS

Course Outcomes :

After the completion of the course the students will be able

1. develop 8086 assembly language programs.
2. Use built in devices of 8051 microcontroller in any application.
3. Define architecture and programming of any other microprocessor or microcontroller.
4. Design 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

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2									**3**	**1**	**2**
CO2	3	3	2	2									**3**	**1**	**2**
CO3	3	3	2	2									**2**	**1**	
CO4	3	3	2	2										**1**	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE19 POWER ELECTRONICS

Course Outcomes :

After completion of the course student will be able to

1. Analyze various power semiconductor devices and their characteristics
2. Analyze the performance of different power converters subjected to various loads.
3. Design equalizing circuits and snubber circuits for protection.
4. Analyze the line commutated converters and SCR based forced commutated converters.
5. Apply the concepts of semiconductor devices for different applications

UNIT-I

POWER SEMICONDUCTOR DEVICES: Thyristors– Silicon Controlled Rectifiers (SCR's) – Power MOSFET – Power IGBT and their characteristics - Basic theory of operation of SCR - Ratings – Static & Dynamic characteristics of SCR – Turn on and turn off methods -Two transistor analogy – SCR Firing Circuits – R, RC and UJT firing circuits – Series and parallel connections of SCR's – Snubber circuit– Commutation Methods - Line Commutation and Forced Commutation circuits–Numerical problems.

UNIT- II

PHASE-CONTROLLED RECTIFIERS: Single phase controlled rectifiers - half wave controlled rectifier, midpoint and bridge connections – semi and fully controlled rectifiers with R and RL loads, derivation of average load voltage and current, effect of freewheeling diode, effect of source inductance, numerical problems.

Three phase controlled rectifiers – half and fully controlled rectifiers – midpoint and bridge connections, derivation of average load voltage with R and RL loads, numerical problems

UNIT- III

DC CHOPPERS: Principle and operation of step up and step down chopper circuit- single quadrant DC chopper with R and RL -Time ratio control and Current limit control– Estimation of average load voltage and load current for continuous current operation-Two quadrant and Four

quadrant chopper -Derivation of load voltage and currents with R, and RL - Basic principles of switch mode power conversion - Buck-Boost converter and Cuck configurations.

UNIT- IV

CYCLOCONVERTERS: Single phase Midpoint cycloconverters with Resistive and Inductive Load (Principle of operation only) – Bridge configuration of single phase cycloconverter (Principle of operation only) – Waveforms.

AC VOLTAGE CONTROLLERS: Single phase AC voltage controllers - two SCRs in anti-parallel with R and RL loads, derivation of rms load voltage and load current, numerical problems.

UNIT- V

INVERTERS: Classification of inverters - voltage source inverters - single phase half bridge and full bridge inverters - Three phase voltage source inverters [120^0 and 180^0 mode] - current source inverters - single phase and Three phase.

Introduction to PWM techniques - single pulse, multi pulse and sinusoidal pulse width modulation - realization of PWM in single phase bridge inverters - Voltage control and reduction of harmonics in the inverters.

TEXT BOOKS:

1. P S Bimbhra, Power Electronics, Khanna Publishers, New Delhi, 4th Edition, 2010.
2. Rashid, M.H, Power Electronics – circuits, devices and applications, Pearson Education India, 1st Edition, 2011.

REFERENCES:

1. M D Singh and K.B.Khanchandani, Power Electronics, Tata McGraw Hill, New Delhi, 2nd Edition, 2006.
2. Andrzej M. Trzynadlowski, Introduction to Modern Power Electronics, John wiley & sons, 2nd Edition, 2011.
3. Ned Mohan, Tore M Undeland, William P Robbins, Power Electronics – Converters, Applications and Design, John Wiley & sons India Pvt Ltd, 3rd Edition, 2007.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	-	-	-	-	-	-	2	2	2	2
CO2	3	2	3	2	1	-	-	-	1	-	-	1	3	2	2
CO3	3	3	3	2	1	-	-	-	1	-	-	1	3	3	2
CO4	2	3	2	2	1	-	-	-	1	-	-	1	3	3	2
CO5	2	3	2	2	2	-	-	-	-	-	-	2	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE20 TRANSMISSION & DISTRIBUTION OF ELECTRICAL POWER

Course Outcomes :

After completion of the course student will be able to

1. Determine the transmission line parameters for various configurations.
2. Estimate the performance of different types of transmission lines.
3. Analyze the corona effect, sag and tension calculations, overhead line insulators and underground cables.
4. Formulate A.C and D.C distribution networks for necessary variable calculation.
5. Analyze the tariff for different power plant models

UNIT-I

TRANSMISSION LINE PARAMETERS: Types of conductors –Calculation of Resistance-Skin and Proximity effect-Calculation of Inductance of single phase, Three phase line with symmetrical and unsymmetrical spacing, Single and double circuits-Concept of GMR and GMD--Numerical Problems- Calculation of capacitance of single phase, Three phase line with symmetrical and unsymmetrical spacing, Single and double circuits.

UNIT-II

PERFORMANCE OF TRANSMISSION LINES: Classification and Representation of Transmission lines-Short Transmission line-Medium Transmission line: End condenser, Nominal T and Nominal Π methods- Long Transmission lines-Rigorous Method-ABCD constants of Transmission lines-Calculation of voltage regulation and efficiency-Numerical Problems-Ferranti effect-Surge impedance and Surge Impedance Loading

UNIT-III

CORONA AND SAG-TENSION CALCULATIONS: Corona phenomena-factors affecting corona-Critical voltages and Power loss-Numerical Problems-Methods of reducing corona-Radio Interference. Factors affecting sag-Calculation of sag and Tension with equal and unequal

heights of towers, effect of wind and Ice on sag- Numerical Problems-Stringing chart and Sag Template – Travelling Waves.

UNIT-IV

INSULATORS AND CABLES: Types of insulators-Potential distribution over suspension Insulator String-String efficiency-Methods of improving String efficiency-Numerical Problems. Construction of cables-Insulating materials –Types of cables-Insulation resistance of single core cable- Capacitance of single and three core cable-Dielectric stress in a single core cable-Grading of cables- Numerical Problems.

UNIT-V

DISTRIBUTION SYSTEMS: Classification-Methods of 3 wire DC system-Radial and Ring Distribution systems-DC Distribution with concentration loads and uniform loading - AC Distribution - Numerical Problems – Layout and Selection of site.

TEXT BOOKS:

1. Soni M.L, Gupta P.V, Bhatnagar U.S, Chakrabarthy.A, A Text Book on Power System Engineering, Dhanpat Rai & Co Pvt. Ltd, 2nd Edition, 2009.
2. Wadhwa.C.L, Electrical power systems, New Age International (P) Limited, Publishers, 6th Edition, 2010.

REFERENCES:

1. Gupta B.R, Power System Analysis and Design, S. Chand & Co, 6th Revised Edition, 2010.
2. Nagarath I.J and Kothari D.P, Modern Power System Analysis, Tata McGraw Hill, 9th Reprint Edition, 2007.
3. Rajput R. K, Power System Engineering, Laxmi Publications, 1st Edition, 2006.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	-	-	2	-	-	2	2	2	2
CO2	3	3	2	2	-	-	-	-	1	-	-	1	3	2	2
CO3	3	3	2	2	-	-	-	-	1	-	-	1	3	3	2
CO4	2	2	2	2	-	-	-	-	1	-	-	1	3	3	2
CO5	2	2	2	2	-	-	-	-	2	-	-	2	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE21 SPECIAL ELECTRICAL MACHINES

(Professional Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on Construction, operation and characteristics of various types of special electrical machines.
2. Analyze the operation and performance of special electrical machines for various operating conditions.
3. Design suitable accessories / controllers for desired operation and control of special electrical machines.
4. Apply the conceptual knowledge of special electrical machines in relevance to industry and society.
5. Distinguish the different types of special types of AC and DC machines

UNIT-I

STEPPER MOTOR: Types of construction and working principle of stepping motor. Various configurations for switching the phase windings, torque equation and characteristics. Open loop and closed loop control of stepper motor, applications.

UNIT-II

SWITCHED RELUCTANCE MOTOR: Construction details, Principle of operation - Design of stator and rotor pole arcs - torque equation and characteristics, power converter for switched reluctance motor, control of switched reluctance motor, rotor sensing mechanism.

UNIT-III

SYCHRONOUS RELUCTANCE MOTOR: Constructional features, Types – Axial and Radial flux motors. Principle of operation, torque-speed characteristics, Phasor diagram, Characteristics, control of SRM, advantages and applications.

UNIT-IV

PERMANENT MAGNET BRUSHLESS DC MOTOR: Permanent magnet materials-hysteresis loop, analysis of magnetic circuits. Constructional details, principle of operation, BLDC square wave motor, types of BLDC motor, sensing and switching logic schemes, sensorless and sensor based control of BLDC motors.

UNIT-V

LINEAR MOTORS: Linear Induction Motor - Construction, principle of operation- single sided and double-sided LIM, thrust equations and performance equations based on current sheet concept, equivalent circuit of LIM, applications. Linear Synchronous Motor - Construction, types, principle of operation, thrust equation, control and applications.

TEXT BOOKS:

1. K. VenkataRatnam, Special electrical machines, University press, New Delhi, 2008.
2. E.G. Janardhanan, Special electrical machines, PHI learning private limited, 2014.

REFERENCE BOOKS:

1. T. Kenjo and S. Nagamori, Permanent-Magnet and Brushless DC Motors, clarenden press, Oxford, 1985.
2. T.J.E. Miller, Brushless Permanent Magnet and Reluctance Motor Drives, clarenden press, Oxford, 1st Edition, 1989.
3. Takashi Kenjo, Stepping Motors and their Microprocessor controls, clarenden press, Oxford, 2nd Edition 1984.
4. R. Krishnan, Switched Reluctance Motor Drives - Modeling, Simulation, analysis, Design and Applications, CRC press, Special Indian Edition, 2015.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	--	2	--	--	--	--	--	--	2	2	2
CO2	3	2	2	3	--	2	--	--	--	--	--	--	1	1	2
CO3	2	2	1	2	--	1	--	--	--	--	--	--	2	2	1
CO4	3	1	--	3	--	--	--	--	--	--	--	--	3	3	--
CO5	3	3	2	3	-	2	-	-	-	-	-	-	1	1	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE22 WIND AND SOLAR POWER SYSTEMS

(Professional Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Develop interconnection of solar and wind systems
2. Apply the knowledge of technical aspects of solar and wind energy
3. Design modular system for wind and solar systems
4. Select the different types technology in generating stations
5. Choose the wind and solar power plant according to the demand

UNIT I:

COMMERCIAL ENERGY: Coal, Oil, Natural Gas, Nuclear power and Hydro - their utilization pattern in the past, present and future projections of consumption pattern - Sector-wise energy consumption – environmental impact of fossil fuels – Energy scenario in India – Growth of energy sector and its planning in India – Fuel cell.

UNIT II

SOLAR ENERGY: Solar radiation at the earth's surface – solar radiation measurements – estimation of average solar radiation - solar thermal flat plate collectors - concentrating collectors – solar thermal applications - heating, cooling, desalination, drying, cooking, etc –solar thermal electric power plant - principle of photovoltaic conversion of solar energy, types of solar cells - Photovoltaic applications: battery charger, domestic lighting, street lighting, water pumping etc - solar PV power plant – Net metering concept.

UNIT III

WIND ENERGY: Nature of the wind – power in the wind – factors influencing wind – wind data and energy estimation - wind speed monitoring - wind resource assessment - Betz limit - site selection - wind energy conversion devices - classification, characteristics, applications – offshore wind energy - Hybrid systems - safety and environmental aspects – wind energy potential and installation in India - Repowering concept.

UNIT IV

WIND INTERCONNECTION: Requirements, low-voltage ride through (LVRT), ramp rate limitations, and supply of ancillary services for frequency and voltage control, current practices and industry trends wind interconnection impact on steady-state and dynamic performance of the power system including modeling issue, variable speed systems-Power-wind speed characteristics-Variable speed constant frequency systems synchronous generator- DFIG- PMSG -Variable speed generators modeling – Variable speed variable frequency schemes.

UNIT V

GENERATING SYSTEMS: Constant speed & constant frequency systems Choice of Generators- Deciding factors-Synchronous Generator-Squirrel Cage Induction Generator- Model of Wind Speed- Model wind turbine rotor –HAWT-VAWT-Power developed-Thrust-Efficiency-Rotor selection-Rotor design considerations- Tip speed ratio-No. of Blades-Blade profile-Power Regulation-yaw control-Pitch angle control- stall control-Schemes for maximum power extraction., Components of WECS-WECS schemes-Power obtained from wind-simple momentum theory- Power coefficient-Sabinin's theory-Aerodynamics of Wind turbine

TEXT BOOKS:

1. Godfrey Boyle, Renewable Energy, Power for a Sustainable Future, Oxford University Press, U.K, 2nd Edition, 2012.
2. Sukhatme, S.P & J K Nayak, Solar Energy, Tata McGraw Hill, 4th Edition, 2017.

REFERENCES:

1. Twidell, J.W. and Weir, A, Renewable Energy Sources, EFN Spon Ltd., 2nd Edition, 2005.
2. Kishore VVN, Renewable Energy Engineering and Technology, Teri Press, New Delhi, 2nd Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	-	1	-	-	3	2	3	3	2	3	3	3	1
CO2	2	3	-	1	-	-	3	3	3	3	3	3	3	3	1
CO3	2	3	-	1	-	-	3	3	3	3	3	3	1	3	1
CO4	3	3	-	3	-	-	1	-	3	3	2	3	3	3	3
CO5	3	1	1	3	1	1	3	1	1	3	1	1	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE23 SOFT COMPUTING TECHNIQUES

Course Outcomes :

After completion of the course student will be able to

1. apply knowledge on various Artificial intelligence techniques like artificial neural networks (ANN),
2. Analyze the concepts fuzzy logic controller(FLC), genetic algorithm(GA)
3. Analyze various supervised learning techniques and Training algorithms.
4. Design Training algorithms using ANN, Rule base used in fuzzy logic controller Optimum solutions using GA
5. 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.

Applications to Electrical Systems: ANN based Short term Load Forecasting - Load flow Studies - Fuzzy logic based Unit Commitment and Genetic Algorithm based Economic Dispatch.

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.

REFERENCES:

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. Short term load forecasting using Artificial Neural Network: A comparison with Genetic Algorithm Implementation, Pradeepta Kumar Sarangi, Nanhay Singh, R.K.Chauhan and Raghuraj Singh: ARPN Journal of Engineering and Applied Sciences, Vol. 4, No. 9, November 2009.
4. 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	-	-	2	-	-	-	2	2	2
CO2	3	3	2	2	-	-	-	-	1	-	-	-	3	3	2
CO3	3	3	2	2	-	-	-	-	1	-	-	-	3	2	3
CO4	2	2	2	2	-	-	-	-	1	-	-	-	3	2	3
CO5	2	2	2	2	-	-	-	-	2	-	-	-	2	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE24 INSTRUMENTATION

(Professional Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate Knowledge of Characteristic parameters of various measuring instruments.
2. Analyze the performance characteristics of various measuring instruments and various digital voltmeters and transducers
3. Appraise the signal analyzers, oscilloscopes, storage oscilloscopes.
4. Categorize various types of transducers, signal analyzers, storage oscilloscopes and its applications.
5. Develop skills to evaluate various non electrical quantities and performance characteristics of measuring instruments

UNIT-I

CHARACTERISTICS OF SIGNALS AND THEIR REPRESENTATION: Measuring Systems, Performance Characteristics, - Static Characteristics, Dynamic Characteristics; Errors in Measurement – Gross Errors, Systematic Errors, Statistical Analysis of Random Errors. Signal and Their Representation: Standard Test, Periodic, A periodic, Modulated Signal, Sampled Data, Pulse Modulation and Pulse Code Modulation.

UNIT-II

DATA TRANSMISSION, TELEMETRY AND DAS: Methods of Data Transmission – General Telemetry System. Frequency Modulation System (FM), Pulse Modulation (PM), Pulse Amplitude Modulation (PAM), Pulse Code Modulation (PCM) Telemetry. Comparison of FM, PM, PAM and PCM. Analog and Digital Acquisition Systems – Components of Analog DAS – Types of Multiplexing Systems: Time Division and Frequency Division Multiplexing – Digital DAS – Block Diagram — Modern Digital DAS (Block Diagram)

UNIT-III

SIGNAL ANALYZERS: Wave Analysers- Frequency Selective Analyzers, Heterodyne, Application of Wave Analyzers and Harmonic Analyzers, Total Harmonic Distortion, Spectrum Analyzers, Basic Spectrum Analyzers, Spectral Displays, Vector Impedance Meter, Q Meter.

Peak Reading and RMS Voltmeters Digital Voltmeter-Successive Approximation, Ramp and Integrating Type-Digital Frequency Meter-Digital Multimeter-Digital Tachometer

UNIT-IV

TRANSDUCERS: Definition of Transducers, Classification of Transducers, Advantages of Electrical Transducers, Characteristics and Choice of Transducers; Principle Operation of Resistor, Inductor, LVDT and Capacitor Transducers; LVDT Applications, Strain Gauge and Its Principle of Operation, Gauage Factor, Thermistors, Thermocouples, Synchros, Piezo Electric Transducers, Photovoltaic, Photo Conductive Cells, Photo Diodes.

UNIT-V

MEASUREMENT OF NON-ELECTRICAL QUANTITIES: Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Angular Velocity, Acceleration, Force, Torque, Temperature, Pressure, Flow, Liquid level.

TEXT BOOKS:

1. A.K. Sawhney, A course in Electrical and Electronic Measurements and Instrumentation, Dhanpat Rai & Co, 2015.
2. D.V.S Murthy, Transducers and Instrumentation, Prentice Hall of India, 2nd Edition, 2008.

REFERENCE BOOKS:

1. H.S.Kalsi, Electronic Instrumentation, Tata MC Graw-Hill, 3rd Edition, 2010.
2. A.D Helfrick and W.D.Cooper, Modern Electronic Instrumentation and Measurement techniques, Pearson/Prentice Hall of India, 1st Edition, 2016.
3. T. R. Padmanabhan, Industrial Instrumentation – Principles and Design, Springer, 2000.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	-	-	-	-	-	-	2	3	1
CO2	2	2	2	1	-	1	-	-	-	-	-	-	3	1	1
CO3	2	1	3	1	-	-	-	-	-	-	-	-	1	1	1
CO4	3	3	-	1	-	-	-	-	-	-	-	-	3	1	3
CO5	3	1	1	3	1	1	-	-	-	-	-	-	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE25 DISCRETE TIME CONTROL SYSTEMS

(Professional Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Learn the advantages of discrete time control systems.
2. Apply Z–transformations and their role in the mathematical analysis
3. Examine the stability criterion for digital systems and various methods adopted for testing.
4. Analyze the conventional and state–space methods of design.

UNIT – I

INTRODUCTION TO SIGNAL PROCESSING: Introduction to analog and digital control systems – Advantages of digital systems – Typical examples – Signals and processing – Sample and hold devices – Sampling theorem and data reconstruction – Frequency domain characteristics of zero order hold.

UNIT–II

Z–TRANSFORMATIONS: Z–Transforms – Theorems – Finding inverse z–transforms – Formulation of difference equations and solving – Block diagram representation – Pulse transfer functions and finding open loop and closed loop responses.

UNIT–III

STATE SPACE ANALYSIS: State Space Representation of discrete time systems – State transition matrix and methods of evaluation – Discretization of continuous – Time state equations – Concepts of controllability and observability – Design of state feedback controller through pole placement – Necessary and sufficient conditions – Ackerman's formula.

UNIT – IV

STABILITY ANALYSIS: Mapping between the S–Plane and the Z–Plane – Primary strips and Complementary Strips – Stability criterion – Modified routh's stability criterion and jury's stability test.

UNIT – V

DESIGN OF DISCRETE–TIME CONTROL SYSTEMS BY CONVENTIONAL METHODS: Transient and steady state specifications – Design using frequency response in the w–plane for lag and led compensators – Root locus technique in the z– plane.

TEXT BOOK:

1. K. Ogata, Discrete–Time Control systems, Pearson Education/PHI, 2nd Edition, 2005.

REFERENCE BOOKS:

1. Kuo, Digital Control Systems, Oxford University Press, 2nd Edition, 2003.
2. M.Gopal, Digital Control and State Variable Methods, Tata McGraw Hill, 4th Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	3	1	3	-	-	-	-	-	-	3	3	1
CO2	2	2	2	3	1	3	-	-	-	-	-	-	3	3	2
CO3	2	3	3	3	-	3	-	-	-	-	-	-	1	3	1
CO4	3	3	-	3	-	3	-	-	-	-	-	-	3	3	3
CO5	3	2	1	1	1	1	-	-	-	-	-	-	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE26 CONTROL SYSTEMS LAB

Course Outcomes :

After completion of the course student will be able to

1. estimate performance of second order systems using P, PI, PID controllers.
2. Design Lag, Lead, Lag-Lead compensation circuits.
3. Evaluate performance of synchros, AC servo motor and DC servo motor.
4. Assess performance of D.C motor using Transfer function
5. Use PLC controllers in Electrical Systems

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Time response of Second order system using P, PI & PID controller.
2. Transfer function of DC Motor using Armature voltage control and field control.
3. Characteristics of Synchros
4. Characteristics of AC servo motor
5. Position control on DC servo motor
6. Lag ,Lead & Lead- Lag compensation – Magnitude and phase plots
7. Simulation of Transfer function using OP-AMP.
8. Characteristics of magnetic amplifiers
9. Temperature controller using PID
10. Programmable logic controller-study and verification of truth tables of logic gates simple Boolean expressions and application of speed control of the motor
11. Transfer function of DC generator
12. Effect of P,PI,PID controllers on a second order systems

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	2	2	-	3	-	2	2	2	2	1	2	2	2	2
CO2	1	2	3	-	3	-	3	3	3	3	3	1	3	2	2
CO3	1	3	3	-	3	-	3	3	3	2	3	1	3	3	2
CO4	1	3	3	-	2	-	3	3	3	2	1	3	3	3	2
CO5	2	3	2	-	2	-	2	2	2	3	2	3	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE27 INDUCTION AND SYNCHRONOUS MACHINES LAB

Course Outcomes :

After completion of the course student will be able to

1. Determine the performance characteristics of single phase transformer
2. Determine the performance characteristics of 3 phase Induction motor.
3. Determine the efficiency of 3-phase Induction motor at various loads.
4. Predetermine the regulation and efficiency of three phase alternator at different loads.
5. Determine Xd and Xq on a salient pole synchronous machine.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. No-load and Blocked Rotor tests on a three phase induction motor-Predetermination of performance curves by drawing circle diagram.
2. Brake Test on Three-phase squirrel cage Induction Motor-Determination of performance curves.
3. OCC and SC tests on three phase alternator- predetermination of regulation and efficiency by EMF, MMF and Potier triangle methods.
4. No load and load tests on a three phase synchronous motor-Determination of V-Curves and Λ -curves.
5. Determination of X_d and Xq on a salient pole synchronous machine.
6. No load and blocked rotor tests on single phase capacitor start and run Induction Motor - Determination of equivalent circuit parameters.
7. Synchronization of alternator with infinite bus bar using Dark & Bright lamp method
8. Brake Test on Three-phase wound rotor Induction Motor-Determination of performance curves.
9. Load test on 3 phase alternator and draw performance characteristics
10. Analysis of slip characteristic of a 3 phase induction machines
11. Synchronization of alternator with infinite bus bar using synchroscope method

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	-	-	-	2	2	1	2	2	2
CO2	3	3	1	3	2	2	-	-	-	1	1	1	2	2	2
CO3	3	3	1	3	1	2	-	-	-	1	1	1	2	3	3
CO4	2	3	1	3	1	3	-	-	-	1	1	2	2	3	3
CO5	2	2	2	2	1	3	-	-	-	2	2	2	2	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE28 TRANSMISSION AND DISTRIBUTION LAB

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate the knowledge to determine parameters of transmission lines.
2. Demonstrate skills in cable size calculation and fault location of underground cables.
3. Analyze the Ferranti effect in transmission line.
4. Determine the voltage distribution, string efficiency
5. Analyze the performance characteristics of distribution system.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Determination of the ABCD parameters of Short Transmission Line.
2. Determine the ABCD parameters of Medium Transmission Line for T and Π Network.
3. Determine the ABCD parameters for long transmission line.
4. To observe the Ferranti effect in a model of transmission line.
5. Determination of voltage distribution and string efficiency of string of insulators.
6. Measurement of Capacitance of 3 core cable.
7. Fault location of Underground Cables.
8. Operation and constructional features of a Distribution Transformer (11kv/430v).
9. Substation Equipments and its one line diagram.
10. Cable Size Calculation for the given load.
11. Performance characteristics of typical DC distribution system in radial & ring main configuration.
12. To study radial feeder performance when a) fed at one end b) fed at both ends.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	1	2	-	-	1	-	-	-	3	2	2
CO2	3	3	3	2	1	2	-	-	1	-	-	-	3	2	2
CO3	3	3	3	2	1	2	-	-	1	-	-	-	3	2	2
CO4	3	3	3	1	-	-	-	-	-	-	-	-	3	2	2
CO5	3	2	2	1	-	2	-	-	-	-	-	-	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – I Semester (EEE)

L	T	P	C
-	-	-	**0.5**

17AEE29 COMPREHENSIVE ONLINE EXAMINATION

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY (AUTONOMOUS)

III B.Tech-II Semester ECE (Common to ECE & EEE)

L	T	P	C
3	1	-	3

17AEC28 DIGITAL SIGNAL PROCESSING

Course 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. Design 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:

System 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. A. Anand Kumar, 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2										**3**		**3**
CO2	3	3	2	3									**3**	**3**	**1**
CO3	2	3		3									**2**	**3**	**3**
CO4	2	3		3									**2**	**2**	**1**
CO5	1	3	1	1										**2**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE30 POWER SEMICONDUCTOR DRIVES

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on Dynamics of electrical drives.
2. Apply Operation and speed control of various DC and AC drives in open loop and closed loop control of converter fed motors.
3. Analyze single and multi-quadrant operations of DC and AC drives with speed – torque characteristics.
4. Choose the solid-state drives for speed control of various special electrical machine
5. Select the power semiconductor drives for different types applications

UNIT - I

INTRODUCTION TO ELECTRICAL DRIVES : Electric Drives-Fundamental of Electric Drives-Advantages of Electric Drives. Dynamics of Electric Drives-Fundamental torque equations-speed torque conventions and Multi quadrant operations. Electric Braking-Types of Braking-Regenerative braking, dynamic braking and Plugging. Control of Electric Drives- Modes of operations, speed control and drive classifications, closed loop control of Drives

UNIT - II

CONTROL OF DC MOTORS BY SINGLE PHASE & THREE PHASE CONVERTERS: Single Phase and three phase half and Fully controlled converters connected to DC separately excited and DC series motors – continuous and discontinuous motor current operation – output voltage and current waveforms – Speed-Torque Characteristics - Single Phase and three phase Dual converter control of DC separately excited motor- Application -Numerical Problems

UNIT - III

DC CHOPPER DRIVES: Control of DC separately excited motor by one, two and four quadrant choppers, control of DC series motor by one quadrant chopper including electric braking (Regenerative and Dynamic) – voltage and current waveforms for continuous motor currents, Application, Numerical problems. Closed loop separately excited DC motor.

UNIT- IV

CONTROL OF INDUCTION MOTOR: Control of Induction Motor by AC Voltage Controllers – speed torque characteristics- Variable frequency control of induction motor by

Voltage source ,current source inverter and Cycloconverters –Speed torque characteristics –- Static rotor resistance control – Slip power recovery – Static Scherbius drive – Static Kramer Drive, performance , Application and speed torque characteristics.

UNIT - V

SYNCHRONOUS AND SPECIAL MOTOR DRIVES: Modes of variable frequency control. Operation of self-controlled synchronous motors by VSI, CSI and cycloconverters. Load commutated CSI fed synchronous motor drive - operation and waveforms. Stepper motor drives - torque Vs stepping rate characteristics, drive circuits. Switched reluctance motor drives - converter circuits, modes of operation and closed loop speed control.

TEXT BOOKS:

1. GopalK. Dubey, Fundamentals of Electric Drives, Narosa Publications, 2nd edition, 2004.
2. M.D. Singh, K.B. Khanchandani, Power Electronics, Tata McGraw Hill, 2nd edition, 2013.

REFERENCE BOOKS:

1. R,Krishnan, Electric motor drives modeling, Analysis and control, pearson publications, 1st Edition, 2009
2. Bose.B.K, Modern Power Electronics and AC Drives, PHI Publishers, 2005.
3. Rashid.M.H, Power Electronics-Circuits, Devices and applications, Pearson Publications, 3rd Edition, 2009.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3	-	-	1	-	1	-	-	2	2	2
CO2	3	3	1	1	3	-	-	1	-	1	-	-	2	2	2
CO3	3	3	2	1	3	-	-	1	-	1	-	-	2	3	2
CO4	3	2	2	1	2	-	-	1	-	1	-	-	2	3	2
CO5	2	2	2	2	2	-	-	2	-	2	-	-	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE31 POWER SYSTEM ANALYSIS

Course Outcomes :

After completion of the course student will be able to:

1. Design mathematical models for power system components.
2. Perform load flow solution of power system.
3. Analyze per unit system and various types of faults.
4. Apply the concept of power system stability.
5. Relate the applications of power system and protections

UNIT-I

INCIDENCE AND NETWORK MATRICES: Representation of power system elements – Graph Theory – Incidence Matrices – Primitive Network – Formation of Bus Admittance Matrix: Direct Inspection Method – Singular Transformation Method – Formation of Bus Impedance Matrix: Performance Equation of a Partial Network – Addition of a Branch – Addition of a Link – Modification of the Z_{BUS} – Numerical Problems on Incidence and Network Matrices.

UNIT-II

LOAD FLOW STUDIES: Necessity of Load Flow Studies – Formation of Load Flow Problem - Bus Classification – Gauss-Seidel Method: without and with PV buses – Line flow and Loss calculations – Newton Raphson Method: Polar and Rectangular Forms – Jacobian Elements – Numerical Problems GS and NR methods for one iteration – Decoupled Load Flow and Fast Decoupled Load Flow methods and its assumptions – Comparison of Load Flow Methods – DC Load Flow.

UNIT-III

SYMMETRICAL FAULT ANALYSIS: Per Unit System - Per Unit equivalent reactance network - Numerical Problems - Symmetrical Fault Analysis: Short Circuit Current and MVA Calculations - Application of Series Reactors – Current Limiting Reactors - Numerical Problems.

UNIT-IV

UNSYMMETRICAL FAULT ANALYSIS: Symmetrical Components: Symmetrical Component Transformation - Sequence Impedances and Networks of Synchronous Machine and

Transformer – sequence networks-Numerical Problems.

Unsymmetrical Fault Analysis: Symmetrical Component Analysis of Unsymmetrical Faults - LG, LL and LLG Faults - Open Conductor Faults – Numerical Problems.

UNIT-V

STABILITY STUDIES: Introduction to Power System Stability – Inertia Constant and Swing Equation – Power Angle Curve – Steady State Stability – Transient Stability: Equal Area Criterion for Single Machine Infinite Bus – Applications of Equal Area Criterion – Critical Clearing Angle and Critical Clearing Time – Solution of Swing Equation by Point-by-Point Method – Methods of Improving Steady State and Transient Stabilities.

TEXT BOOKS:

1. I.J. Nagrath & D. P. Kothari, Modern Power System Analysis, Tata McGraw-Hill Publishing Company, 4th Edition, 2011.
2. D.Das, Electrical Power Systems, New Age International Publishers, 2009.
3. Stagg and EI-Abiad, Computer Methods in Power Systems, International Student Edition, McGraw-Hill, 1st Edition, 1968.

REFERENCE BOOKS:

1. LP Singh, Advanced Power System Analysis and Dynamics, New Age International Publishers, 6th Edition, 2012.
2. William D.Stevension Jr., Elements of Power System Analysis, McGraw Hill, 4th Edition, 1995.
3. Hadi Saadat, Power System Analysis, TMH Edition, 3rd Edition, 2002.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	2	1	-	1	1	-	3	2	2
CO2	3	3	3	1	-	1	2	1	-	1	1	-	3	2	2
CO3	3	3	3	1	-	1	2	1	-	1	1	-	3	2	2
CO4	3	2	2	1	-	1	2	2	-	-	2	-	3	2	2
CO5	2	2	2	2	-	2	2	2	2	-	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE32 SWITCHGEAR AND PROTECTION

Course Outcomes :

After completion of the course student will be able to

1. Relate the field of power system protection and circuit breakers
2. Demonstrate the transformer and generator protection
3. Enhance performance of switchgear, feeders and transmission lines protection
4. Explain concept of insulation co-ordination and BIL
5. Construct different types power systems protections

UNIT-I

FUSES AND CIRCUIT BREAKERS: Fuses- Definitions- Types and selection of fuses- Discrimination- Circuit breakers- Phenomena-Initiation and maintenance of arc-Methods of arc interruption - Restriking Voltage and Recovery voltage - Restriking Phenomenon - Average and Maximum RRRV - Numerical Problems - Current Chopping and Resistance Switching. Description and Operation of Minimum Oil Circuit breakers - Air Blast Circuit Breakers - Vacuum and SF_6 circuit breakers.

UNIT-II

RELAYS: Basic Requirements of Relays – Primary and Backup protection - Construction details – Attracted armature, balanced beam, Induction type and Differential type relays – Universal Torque equation – Characteristics of over current - Directional and Distance relays. Static Relays – Advantages and Disadvantages – Definite time, Inverse and IDMT static relays – Comparators – Amplitude and Phase comparators - Microprocessor based relays(flow charts) – Block Diagram for Over current and Distance relays – Numerical Relays.

UNIT-III

PROTECTION OF GENERATOR AND TRANSFORMER: Protection of generators against Stator faults, Rotor faults and abnormal Conditions - Restricted Earth fault and Inter-turn fault Protection - Numerical Problems on Percentage Winding Unprotected. Protection of transformers - Percentage Differential Protection - Numerical Problem on Design of CT's Ratio - Buchholz relay Protection.

UNIT-IV

PROTECTION OF FEEDERS AND TRANSMISSION LINES: Protection of Feeder (Radial

& Ring main) using over current Relays - Protection of Transmission line 3-Zone protection using Distance Relays - Carrier current protection - Protection of Bus bars.

UNIT-V

PROTECTION AGAINST OVER VOLTAGES: Generation of Over Voltages in Power Systems - Protection against Lightning Over Voltages – Types of Lightning Arresters - Insulation Coordination – Basic impulse insulation level(BIL).

TEXT BOOKS:

1. Badari Ram, Viswakarma.D.N, Power System Protection and Switchgear, Tata MC Graw Hill Publications, 2nd Edition, 2011.
2. A.Chakrabarti, M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A Text Book on Power system Engineering, Dhanpat Rai & Co. Pvt Ltd, 2nd Edition, 2009.

REFERENCES:

1. Wadhwa.C.L, Electrical Power Systems, New Age international (P) Limited, 6th Edition, 2010.
2. Bhuvanesh Oza, Power System protection and switch gear, Tata MCGraw Hill, 2010.
3. Paithankar.Y.G, Transmission network protection, Taylor and Francis, 2009

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO2	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO3	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO4	3	2	2	2	-	2	2	-	2	1	-	-	3	2	3
CO5	2	2	2	2	2	2	2	2	2	2	-	-	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE33 MODELING AND ANALYSIS OF ELECTRIC MACHINES

(Professional Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Acquire knowledge of transformation models
2. Design electrical machines for various applications.
3. Develop induction and synchronous machine modeling analysis
4. Define salient pole machines and park's model.
5. Relate the concepts of electric machines its performance

UNIT-I

MAGNETICALLY COUPLED CIRCUITS WITH ELECTROMECHANICAL ENERGY CONVERSION: Review of basic concepts, magnetizing inductance, modeling linear and nonlinear magnetic circuits-Principles of energy flow, concept of field energy and co-energy, Derivation of torque expression for various machines using the principles of energy flow and the principle of co-energy, Inductance matrices of induction and synchronous machines.

UNIT-II

THEORY OF DC MACHINES: Review of the DC machine, mathematical model of commutator, State-space model of a DC machine, reduced order model & transfer function of the DC machine, Reference Frame Theory-Concept of space vector, components of space vector, direct and quadrature axis variables.

UNIT-III

TRANSFORMATION: Types of transformation, condition for power invariance, zero-sequence component, Expression for power with various types of transformation, Transformations between reference frames, Clarke and Park's Transformations, Variables observed from various frames, Simulation studies.

UNIT-IV

THEORY OF SYMMETRICAL INDUCTION MACHINES: Voltage and torque in machine variables, Derivation of dq_0 model for a symmetrical induction machine, Voltage and torque equation in arbitrary reference frame variables, Analysis of steady state operation, State-space model of induction machine in d-q variables, Simulation studies.

UNIT-V

THEORY OF SYNCHRONOUS MACHINES: Equations in arbitrary reference frame, Park's transformation, Derivation of dq_0 model for a salient pole synchronous machine with damper windings, Torque expression of a salient pole synchronous machine with damper windings and identification of various components.

TEXT BOOKS:

1. Paul C. Krause, Oleg Wasynczuk, Scott D. Sudhoff, Analysis of Electric Machinery & Drive systems, IEEE Press, 3rd Edition, 2002.
2. Rama Krishnan, Electric motor drives: modeling, analysis, and control, Prentice Hall, 1st Edition, 2001.

REFERNCE BOOKS:

1. Rik De Doncker, Duco W. J. Pulle, Andre Veltman, Advanced Electrical Drives: Analysis, Modeling, Control Springer, 1st Edition, 2011.
2. E. Fitzgerald, Charles Kingsley, Stephen D. Umans, Electric Machinery, TMH, 5th Edition, 2002.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	1	-	-	-	1	-	-	-	3	3	1
CO2	2	3	2	3	1	-	-	-	1	-	-	-	2	3	1
CO3	2	2	3	3	-	-	-	-	1	-	-	-	1	3	1
CO4	3	3	3	3	-	-	-	-	1	-	-	-	3	3	3
CO5	3	2	1	1	1	-	-	-	-	-	-	-	3	1	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE34 HIGH VOLTAGE ENGINEERING

Course Outcomes :

After completion of the course student will be able to

1. Describe the high voltage technology.
2. Compute the breakdown strength of gas, liquids and solids insulation systems.
3. Develop equivalent circuit models of the different high voltage generators
4. Analyze the performance of dynamic response analysis of high voltage measurement systems.
5. Test the insulation life and accelerated tests on electrical apparatus.

UNIT-I

INTRODUCTION: Introduction to HV technology, Need for generating high voltages in laboratory, Industrial applications in high voltage, Electrostatic precipitation and Separation.

UNIT-II

BREAKDOWN MECHANISM OF GASES, LIQUID AND SOLID MATERIALS: Gases as insulating media- Collision process - Ionization process—Townsend's criteria for break down in gases - Paschen's Law -Application of Gases in Power System – Pure and Commercial liquids – Conduction and breakdown in commercial liquids - Suspended Solid Particle Mechanism- Cavity Breakdown-Stressed oil volume theory- Breakdown in Solid dielectrics- Intrinsic breakdown - Electromechanical Breakdown - Breakdown Due to Treeing and Tracking - Thermal Breakdown.

UNIT-III

GENERATION OF HIGH D.C. AND A.C. IMPULSE VOLTAGES AND IMPULSE CURRENTS: Voltage doubler Circuit -Cockroft -Walton Voltage Multiplier Circuit - Electrostatic Generator- Cascaded Transformers- Resonant transformers- Tesla coil- Definitions - Impulse Generator Circuits -Multistage Impulse Generator Circuit- Impulse Current Generation.

UNIT-IV

MEASUREMENT OF HIGH VOLTAGES AND CURRENTS: Generating Voltmeter - Electrostatic Voltmeter - The Chubb-Fortescue Method - Impulse Voltage Measurements using Voltage Dividers – Sphere gap measurement -Measurement of High dc and Impulse Currents- Hall Generators- High Power Frequency Currents - High Frequency and Impulse Currents.

UNIT-V

HIGH VOLTAGE TESTING OF ELECTRICAL EQUIPMENT: Testing of Overhead Line Insulators - Testing of Cables -Testing of Bushings - Testing of Power Capacitors - Testing of Power Transformers - Testing of Circuit Breakers.

TEXT BOOKS:

1. M. S. Naidu and V. Kamaraju, High Voltage Engineering, TMH Publications, 4th Edition, 2009.
2. C.L.Wadhwa, High Voltage Engineering, New Age Internationals (P) Limited, 2nd Edition, 2007.

REFERENCES:

1. Begamudre.R.D, High Voltage Engineering Problems & Solutions, New Age International Publishers, 1st Edition, 2010.
2. E.Kuffel, W.S.Zaengl, J.Kuffel, High Voltage Engineering: Fundamentals, Elsevier, 2nd Edition, 2008.
3. Alston L. L., High Voltage Technology, Oxford University Press, New Delhi, 1st Indian Edition, 2006.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	2	-	-	-	-	-	-	2	2	2	2
CO2	3	2	3	2	1	-	-	-	1	-	-	1	3	2	2
CO3	3	3	3	2	1	-	-	-	1	-	-	1	3	3	2
CO4	2	3	2	2	1	-	-	-	1	-	-	1	3	3	2
CO5	2	3	2	2	2	-	-	-	-	-	-	2	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE35 INDUSTRIAL AUTOMATION AND CONTROL

(Professional Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on automation, Mechanical, electrical and hydraulic
2. Demonstrate knowledge of Pneumatic automation devices and controls.
3. Analyze high volume of manufacturing automation and automated flow lines.
4. Design various motors, manufacturing system assembly automation and robotics.
5. Apply artificial intelligence technique in robotics.

UNIT-I

INTRODUCTION TO AUTOMATION: Automation production system, Mechanization and automation, Types of automation, Automation strategies, Mechanical, electrical, hydraulic and Pneumatic automation devices and controls, Economics of automation.

UNIT-II

HIGH VOLUME MANUFACTURING AUTOMATION: Classification and type of automatic transfer machines; Automation in part handling and feeding, Analysis of automated flow lines, design of single model, multi- model and mixed model production lines. Programmable Manufacturing Automation: CNC machine tools, Machining centers, Programmable robots, Robot time estimation in manufacturing operations.

UNIT-III

FLEXIBLE MANUFACTURING AUTOMATION: Introduction to Group Technology, Grouping methods, Cell Design, Flexible manufacturing system Assembly Automation: Assembly systems, Automatic transfer, feeding and orienting devices, Flexible assembly systems, Performance evaluation and economics of assembly systems.

UNIT-IV

ROBOTICS: Review of robotic technology and applications, Laws of robotics, Robot systems and anatomy, Robot classification, End Effectors, Robot kinematics, Object location, Homogeneous transformation, Direct and inverse kinematics, Manipulator motions, Robot drives, actuators and control, Drive systems, Hydraulic, Pneumatic Electrical DC and AC servo motors and stepped motors, Mechanical transmission method Rotary to rotary motion conversion, Robot motion and path planning control and Controllers, Robot sensing, Range sensing, Proximity sensing, touch sensing, Force and torque sensing e, Robot vision, Image representation, Image recognition approaches.

UNIT-V

ROBOT APPLICATIONS: Robot applications in manufacturing Material transfer and machine loading/unloading, Processing operations like Welding & painting, Assembly operations, Inspection automation, Robot cell design and control, Robot cell layouts -Multiple robots & Machine interference, Economics and social aspects of robotics. Task Programming, Goals of AI Research, AI Techniques, Robot Intelligence and Task Planning, Modern Robots, Future Application and Challenges and Case Studies.

TEXT BOOKS:

1. Jon Stenerson, Industrial Automation and Process Control, Ohio Prentice –Hall, 1st Edition, 2002.
2. Frank Petruzella, Programmable Logic Controllers, McGraw-Hill Education, 3rd Edition, 2010.

REFERENCE BOOKS:

1. Frank Lamb, Industrial Automation Hands, Mc-Graw Hill Education, 2nd Edition, 2013
2. Considine, Douglas M, Handbook of Industrial Automation, 1st Edition, 1986.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	-	-	2	-	-	2	2	2	2
CO2	3	3	2	2	-	-	-	-	1	-	-	1	3	2	2
CO3	3	3	2	2	-	-	-	-	1	-	-	1	3	3	2
CO4	2	2	2	2	-	-	-	-	1	-	-	1	3	3	2
CO5	2	2	2	2	-	-	-	-	2	-	-	2	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE36 ENERGY MANAGEMENT SYSTEMS AND SCADA

(Professional Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Develop skills in PLC and SCADA
2. Design machine control and industrial automation control
3. Use multi controller and load centre in engineering applications
4. Apply unit commitment problems
5. Relate the concepts dual processor control.

UNIT - I

ENERGY MANAGEMENT: Centers and Their Functions, Architectures, recent Developments - Characteristics of Power Generating Units and Economic Dispatch - Unit Commitment (Spinning Reserve, Thermal, Hydro and Fuel Constraints); Solution techniques of Unit Commitment. Generation Scheduling with Limited Energy. Energy Production Cost – Cost Models, Budgeting and Planning, Practical Considerations.

UNIT-II

ENERGY MANAGEMENT CENTER: Types of Interchanges. Exchange Costing Techniques Functions performed at a centralized management center, production control and load management, economic dispatch, distributed centers and power pool management. Interchange Evaluation for Regional Operations.

UNIT-III

GENERAL THEORY: Purpose and necessity, general structure, data acquisition, transmission and monitoring, general power system hierarchical structure, overview of the methods of data acquisition systems, commonly acquired data, transducers, RTUs, data concentrators, various communication channels, cables, telephone lines, power line carrier, microwaves, fiber- optical channels and satellites.

UNIT-IV

SUPERVISORY AND CONTROL FUNCTIONS: Data acquisitions, status indications, measured values, energy values, monitoring alarm and event application processing. Control function: ON/OFF control of lines, transformers, capacitors and applications in process industry, valve, opening, closing etc. Regulatory functions: set points and feed-back loops, time tagged data, disturbance data collection and analysis, calculation and report preparation. **MAN-Machine Communication:** Operator consoles and VDUs, displays, operator dialogues, alarm and event loggers, mimic diagrams, report and printing facilities.

UNIT-V

DATA BASES - SCADA, EMS AND NETWORK DATA BASES: SCADA system structure - local system, communication system and central system, Configuration- non-redundant single processor, redundant dual processor, multi control centers, system configuration. Performance considerations: real time operation system requirements, modularization of software programming languages.

TEXT BOOKS

1. Torsten Cegrell, Power System Control Technology, Prentice Hall International, 1986
2. Stuart A. Boyer, SCADA: Supervisory Control and Data Acquisition, The Instrumentation, Systems and Automation Society, 4th Edition, 2009.

REFERENCE BOOKS

1. Bela G. Liptak, Instrument Engineers Handbook, Volume 3: Process Software and Digital Networks, CRC Press, 4th Edition, 2011.
2. Data Communications and Networking, Behrouz Forouzan, McGraw-Hill, 5th Edition, 2012.
3. Computer Based Industrial Control, Krishna Kant, PHI Learning, 2nd Edition, 2013.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	2	2	2	-	-	-	2	2	1	2	2	2
CO2	3	3	1	3	2	2	-	-	-	1	1	1	2	2	2
CO3	3	3	1	3	1	2	-	-	-	1	1	1	2	3	3
CO4	2	3	1	3	1	3	-	-	-	1	1	2	2	3	3
CO5	2	2	2	2	1	3	-	-	-	2	2	2	2	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	1	-	3

17AEE37 UTILIZATION OF ELECTRICAL ENERGY

(Professional Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Apply the knowledge about illumination and different types of lamps.
2. Define the principles in electric heating
3. Apply the concepts electric welding and electrolytic process.
4. Apply the concepts of electric drives
5. Develop skills in electric traction and various methods of electric braking.

UNIT- I

ILLUMINATION: Definition – Laws of illumination – Polar curves – Calculation of Mean Horizontal Candle power (MHCP) and Mean Spherical Candle Power(MSCP) LAMPS: Incandescent lamp, Sodium Vapour lamp, LED lamp luminars Fluorescent lamp. Requirement of good lighting scheme – Types, Design and Calculation of illumination - Street lighting and Factory lighting – comparison between Sodium Vapour lamp, LED lamp - Numerical Problems.

UNIT- II

ELECTRIC HEATING & WELDING : Advantages - Methods of Electric heating – Resistance, Arc, Induction and Dielectric heating. Types of welding – Resistance, Electric arc, gas welding - Ultrasonic, Welding electrodes of various metals, Defects in welding.

ELECTROLYTIC PROCESS: Electrolysis - Faradays laws, Application of Electrolysis, Power supply for Electrolysis Lead acid batteries.

UNIT-III

ELECTRIC DRIVES: Types of DC and AC Motors and their Characteristics – Applications - Speed Control of DC and AC Motors – Temperature rise and Load Equalization – Selection of Motors.

UNIT- IV

ELECTRIC TRACTION–I: Introduction – Systems of Electric Traction - Comparison between AC and DC Traction – Special features of Traction Motors - Methods of Electric Braking – Plugging, Rheostatic and Regenerative types -Mechanics of train movement.

UNIT-V

ELECTRIC TRACTION – II: Speed-time curves of different services – trapezoidal and quadrilateral, speed-time curves – Numerical Problems. Calculations of tractive effort, Power, specific energy consumption - effect of varying acceleration and braking retardation - Adhesive weight and coefficient of adhesion – Problems.

TEXT BOOKS:

1. Partab, Art & Science of Utilization of electrical Energy, Dhanpat Rai & Co., 2014.
2. J.B.Gupta, Utilization of Electric Power and Electric traction, S.K.Kataria & sons, 10th Edition, 1968

REFERENCE BOOKS:

1. Openshaw Taylor.E and Rao.V.V.L, Utilization of Electric Energy, Universities Press, Reprint 2006.
2. Suryanarayana.N.V, Utilization of Electrical Power including Electric drives and Electric traction, New Age International (P) Limited, Publishers, 1996.
3. Uppal.S.L, Power systems, 2009.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	-	2	--	-	1	-	-	-	3	2	3
CO2	3	3	2	1	-	--	2	-	1	-	-	-	3	2	3
CO3	3	3	2	2	-	3	-	-	1	-	-	-	3	3	3
CO4	3	3	1	1	-	-	3	-	1	-	-	-	2	2	3
CO5	3	2	2	1	-	--	--	-	1	--	-	-	3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17ACS06 OBJECT ORIENTED PROGRAMMING THROUGH JAVA

(Open Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. define concept and underlying principles of Object-Oriented Programming.
2. Explain object-oriented concepts
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, JText Field, JTextArea, JList, JComboBox, JTable, JTree, JTabbedPanes, JScrollPane.

NETWORKING: Remote Method Invocation(RMI),Client server communications

TEXT BOOK:

1. Herbert schildt, The complete reference JAVA, Tata Mc graw Hill, New Delhi, 7th Edition, 2010.

REFERENCE BOOKS:

1. T. Budd, An Introduction to Object Oriented Programming, Pearson Education, India, 3rd Edition, 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, Pearson education, India, 7th Edition, 2010.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	2	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	3	2	-	1	-	-	-	-	-	-	-	2	3	-
CO3	-	-	2	-	1	-	-	-	-	-	-	-	-	3	-
CO4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEC43 MEMS AND MICRO SYSTEMS

(Open Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Explain about various MEMS and Micro system products**.**
2. Define construction and functionality of various Micro sensors.
3. Select materials used for the construction of MEMS and Microsystems.
4. Describe Microsystems fabrication processes.
5. Use Micro manufacturing and Microsystems packaging technologies.

UNIT – I

OVERVIEW OF MEMS AND MICROSYSTEMS: Introduction to MEMS and Microsystems, Typical MEMS and Microsystems products, Evolution of Micro fabrication, Microsystems and Microelectronics, The Multidisciplinary nature of Micro system design and manufacture, Microsystems and Miniaturization, Applications of Microsystems in the Automotive industry and Applications of Microsystems in other industries.

UNIT-II

WORKING PRINCIPLES OF MICROSYSTEMS:

Micro sensors: Acoustic wave sensors, Biomedical sensors and Biosensors, Chemical sensor, Optical Sensors, Pressure sensor, Thermal sensor, Gyro sensor, Flow sensor.

Micro actuation: Actuation using Thermal forces, Shape-Memory Alloys, Piezoelectric crystals, Electrostatic forces.

Microsystems: Micro actuators, Micro-accelerometers and Micro fluidics.

UNIT-III

MATERIALS FOR MEMS AND MICROSYSTEMS: Introduction, Substrates and Wafers, Active Substrate Materials, Silicon as a Substrate material, Silicon Compounds, Silicon Piezo resistors, Gallium Arsenide, Quartz, Piezoelectric crystals, Polymers and Packaging materials

UNIT-IV

MICROSYSTEM FABRICATION PROCESSES: Introduction, Photolithography, Ion Implantation, Diffusion, Oxidation, Chemical Vapor Deposition, Physical Vapor Deposition-Sputtering, Deposition by Epitaxy and Etching.

UNIT-V

MICROMANUFACTURING AND MICROSYSTEM PACKAGING:

Micro manufacturing: Introduction, Bulk Micro manufacturing, Surface Micromachining and The LIGA process.

Micro system Packaging: Introduction, Overview of Mechanical Packaging of Microelectronics, Micro system Packaging, Interfaces in Micro system Packaging and Essential Packaging Technologies.

TEXT BOOKS:

1. Tai-Ran Hsu, MEMS & Microsystems Design and Manufacture, Tata McGraw Hill edition, 2008.
2. Chang Liu, Foundations of MEMS, Pearson Education India Limited, 2009.

REFERENCE BOOKS:

1. Marc Madou, Fundamentals of Micro fabrication, CRC press, 2002.
2. Stephen D. Senturia, RF Microelectronics, Kluwer Academic Publishers, 2001.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	-	-	-	-	1	-	-	-	2	2	2
CO2	3	3	2	1	-	-	-	-	1	-	-	-	2	2	1
CO3	3	3	3	1	-	-	-	-	1	-	-	-	2	3	1
CO4	3	3	3	1	-	-	-	-	1	-	-	-	2	3	1
CO5	2	2	2	2	-	-	-	-	2	-	-	-	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (Common to CSE, EEE & AE)

L	T	P	C
3	-	-	3

17AME40 ROBOTICS

(Open Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Describe 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, D-H Notation for a robot.

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, Tata McGraw Hill, 3rd Edition, 2007.

REFERENCES:

1. Ganesh S. Hegde, Industrial Robotics, Lakshmi Publications (P), LTD, 3rd Edition, 2017.
2. Richard D.Klafter, Robotics Engineering, Bangalore, New Delhi, Prentice Hall, Eastern Economy Edition, 1989.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	3	-	-	1	-	1	-	-	2	2	2
CO2	3	3	1	1	3	-	-	1	-	1	-	-	2	2	2
CO3	3	3	2	1	3	-	-	1	-	1	-	-	2	3	2
CO4	3	2	2	1	2	-	-	1	-	1	-	-	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17ACS07 DATABASE MANAGEMENT SYSTEMS

(Open Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Understand functional components of the DBMS.
2. Acquire Capability of maintenance of huge amounts of data along with reducing of redundancy in data.
3. Design data base schema, Develop E,R Model, Evaluate and optimize queries.
4. Understand transaction processing, concurrency control and recovery techniques.

UNIT-I

INTRODUCTION: History of database systems, Database system applications, Database system Vs file systems, Purpose of Database System, Describing and storing data in a DBMS, Structure of a DBMS.

ENTITY-RELATIONSHIP MODEL (E-R MODEL): E-R Diagrams-Features of ER Model, Conceptual Database design with the ER model, Conceptual design for large enterprises.

UNIT-II

RELATIONAL MODEL: Introduction to relational model, Integrity constraints, Querying relational data, Logical Database design, Procedural and Non procedural Query languages (Relational Algebra, Introduction to Relational Calculus).

SQL: SQL Languages**,** The form of a basic SQL query, Data types, Operators, Null values, Aggregate operators ,Union, Intersect and Except operators, Nested queries ,Complex integrity constraints in SQL , Introduction to views, Destroying/Altering Tables and views.

UNIT-III

PL/SQL: Introduction to PL/SQL programming – Advantages of PL/SQL, The generic PL/SQL block, Character set, Literals ,Data types, Variables, Constants, Displaying user messages on the

VDU screen, Comments, Conditional and Control statements, Iterative statements, Exception handling, Procedures ,Functions ,Cursors , Triggers , Packages.

SCHEMA REFINEMENT AND NORMAL FORMS: Introduction to schema refinement, Functional Dependencies, Reasoning about FDs, Normal Forms: 1NF,2NF,3NF,Boyce-Codd Normal Form, Properties of decompositions, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

UNIT-IV

TRANSACTIONS: Transaction Concepts, Transaction state, Implementation of Atomicity and Durability, Concurrent executions, Implementation of Isolation, Serializability, Recoverability

CONCURRENCY: Concurrency control, Lock based protocols, Time stamp based protocols, Validation based protocols, Multiple granularity, Deadlock handling.

UNIT-V

INDEXING AND HASHING: File Organization, Organization of Records in Files, Ordered Indices, B+ Tree Index Files, B-Tree Index Files, Multiple Key Access, Static Hashing, Dynamic Hashing, Comparison of Ordered Indexing and Hashing, Bitmap Indices.

TEXT BOOKS:

1. Raghurama Krishnan, Johannes Gehrke, Data base Management Systems, TATA McGraw-Hill 3rd Edition,2007.
2. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, Database System Concepts, Tata McGraw Hill, 5th Edition, 2006.
3. Ivan Bayross, SQL, PL/SQL programming language of Oracle, BPB Publications 4th Edition, 2010.

REFERENCE BOOKS:

1. Peter Rob, Carlos Coronel, Database Systems Design Implementation and Management, 7th Edition, 2009.
2. Scott Urman, Michael McLaughlin, Ron Hardman, Oracle database 10g PL/SQL programming, Tata McGraw Hill, 6th Edition,2010
3. S.K.Singh, Database Systems Concepts, Design and Applications, Pearson Education, 1st Edition, 2006.
4. RamezElmasri, Shamkant B. Navathe, Fundamentals of Database Systems, Pearson / Addision wesley, 4th Edition, 2007.
5. Ashutosh Kumar Dubey, Database Management Concepts, S.K.Katari & Sons, 3rd Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	2	2	-
CO2	3	3	3	-	-	-	-	-	-	-	-	-	2	2	-
CO3	-	3	3	2	-	-	-	-	-	-	-	-	2	2	-
CO4	-	-	3	2	-	-	-	-	-	-	-	-	2	2	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEC44 COMMUNICATION ENGINEERING

(Open Elective – I)

Course Outcomes :

After completion of the course student will be able to

1. Analyze the different analog continuous wave modulation and demodulation methods.
2. Analyze the different analog and digital pulse modulation and demodulation methods.
3. Analyze the various digital continuous wave modulation and demodulation schemes.
4. Explain basics of satellite and optical fiber communications.

UNIT-I

INTRODUCTION: Elements of communication system, Modulation, Need for Modulation.

LINEAR CW MODULATION: Amplitude Modulation(AM), Modulation Index of AM, Single tone AM, Side band and carrier power of AM, Generation of AM signal using Switching modulator, Demodulation of AM signal using Envelope detector. Double sideband suppressed carrier(DSB- SC) Modulation- Generation of DSB- SC signal using Ring modulator, Demodulation of DSB- SC signal using Coherent detector. Single sideband (SSB) transmission- Generation of SSB signal using Selective- Filtering modulator, Demodulation of SSB signal using Coherent detector. Vestigial sideband (VSB) modulator and Demodulator.

UNIT-II

ANGLE CW MODULATION: Concept of instantaneous frequency, Generalized concept of angle modulation, Bandwidth of angle modulated waves- Narrow band frequency modulation and Wideband frequency modulation, Phase modulation. Generation of FM wave using indirect method, Demodulation of FM by direct differentiation.

UNIT-III

ANALOG PULSE MODULATION: Pulse Amplitude Modulation- Generation and Detection, Pulse Time Modulation Schemes: PWM and PPM Generation and Detection.

DIGITAL PULSE MODULATION: Importance of Digitization Techniques for Analog Messages, Pulse Code Modulation- Generation and Reconstruction, Delta Modulation- Generation and Reconstruction.

UNIT-IV

DIGITAL MODULATION TECHNIQUES: Introduction, Amplitude Shift Keying- Generation and Reconstruction, Frequency Shift Keying- Generation and Reconstruction, Binary Phase Shift Keying- Generation and Reconstruction, Differential Phase Shift Keying- Generation and Reconstruction.

UNIT-V

SATELLITE AND OPTICAL FIBER COMMUNICATIONS: Orbital satellites, Geostationary satellites, Look angles, Satellite system link models, Satellite system parameters, Satellite system link equations; Optical fibers Versus metallic cable, Optical fiber communication system block diagram, Light propagation through an optical fiber, Losses in optical fiber cables, Operation of light emitting diode, PIN diode and LASER.

TEXT BOOKS:

1. B. P. Lathi, Modern Digital and Analog Communication Systems, Oxford University Press, 3rd Edition, 2006.
2. Wayne Tomasi, Electronic Communication Systems- Fundamentals through Advanced, Pearson Education Asia, 5th Edition, 2008.

REFERENCES:

1. Bruce Carlson, & Paul B. Crilly, Communication Systems – An Introduction to Signals & Noise in Electrical Communication, McGraw-Hill International Edition, 5th Edition, 2011.
2. Simon Haykin, Communication Systems, Wiley-India edition, 3rd Edition, 2010.
3. Sam Shanmugam, Digital and Analog Communication Systems, John Wiley, 2005.
4. Herbert Taub& Donald L Schilling, Principles of Communication Systems, Tata McGraw- Hill, 3rd Edition, 2009.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	2	1	-	2	--	-	1	-	-	-	3	2	3
CO2	3	3	2	1	-	--	2	-	1	-	-	-	3	2	3
CO3	3	3	2	2	-	3	-	-	1	-	-	-	3	3	3
CO4	3	3	1	1	-	-	3	-	1	-	-	-	2	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE40 POWER ELECTRONICS LAB

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on characteristics of power devices, converters and AC and DC drives.
2. Analyze the various types of power electronic converter circuits
3. Evaluate and compare various parameters from the operation of converters and drives.
4. Utilization of different control method of AC and DC Drives.
5. Analyze the modulation techniques in Inverter.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Characteristics of SCR, MOSFET & IGBT.
2. Gate firing circuits for SCR's- R, RC and UJT firing circuits.
3. Single Phase Half wave & controlled rectifier with R & RL load.
4. Single Phase fully controlled bridge converter with R and RL loads.
5. Single Phase AC Voltage Controller with R and RL Loads.
6. Single Phase Cycloconverter with R and RL loads.
7. Single phase Full Bridge Inverter with R and RL loads.
8. Three phase half and full controlled bridge converter with R & RL loads
9. Closed loop speed control of DC shunt motor using single phase control rectifier
10. Speed control of inverter fed single phase induction motor
11. Buck & Boost converter with R and RL loads.
12. Speed control of single phase Cycloconverter fed induction motor

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	2	1	-	-	-	1	-	3	2	2
CO2	3	3	3	2	-	2	1	-	-	-	1	-	3	2	3
CO3	3	3	3	2	-	2	1	-	-	-	1	-	3	2	3
CO4	3	2	2	2	-	2	1	-	-	-	1	-	2	2	3
CO5	2	2	2	2	2	2	1	-	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III-B.Tech II Semester (Common to ECE & EEE)

L	T	P	C
-	-	3	1.5

17AEC35 MICROPROCESSORS & MICROCONTROLLERS LAB

Course Outcomes :

At the end of the course student will be

1. Develop 8086 Assembly Language Programs.
2. Use 8086 Microprocessor for any application.
3. Generate types of waveforms.
4. develop 8051 Assembly Language Programs.
5. 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3		2	3									**3**	**2**	**1**
CO2	3	3	3	1									**3**	**2**	**1**
CO3	3	2	2	1									**3**		**1**
CO4	3												**3**	**2**	**1**
CO5	3		3										**3**	**2**	**1**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE41 POWER SYSTEMS AND PROTECTION LAB

Course Outcomes :

After completion of the course student will be able to

1. Analyze the characteristics of various relays.
2. Apply the concepts of transformer protection
3. Evaluate and compare various parameters transmission line design by using SKM power tool
4. Demonstrate knowledge about fault analysis of alternator and in transmission lines.
5. Analyze the dielectric strength of oil and air.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. Determination of Dielectric Strength of oil and air.
2. Differential protection of Transformer.
3. Electro mechanical type 3 – Q over current relay.
4. Directional over current relay.
5. Electro mechanical type over voltage relay.
6. Electro mechanical type under voltage relay.
7. Earth fault relay.
8. Simulation of analysis of short circuit, over current and over voltage faults in over head transmission line using SKM power tool.
9. Simulation of analysis of harmonics investigation and filter design in transmission line using SKM power tool.
10. Simulation of system dynamic, Transient stability and fault analysis in transmission line using SKM power tool.
11. Fault analysis of 3 phase alternator (LG, LL, LLG, LLLG Faults)

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	-	1	-	-	-	-	1	2	3	3
CO2	3	3	3	2	1	-	1	-	-	-	-	1	2	3	3
CO3	3	3	3	2	1	-	1	-	-	-	-	1	2	3	3
CO4	3	3	3	2	1	-	1	-	-	-	-	1	2	3	3
CO5	3	3	3	2	1	-	1	-	-	-	-	1	2	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

III B.Tech – II Semester (EEE)

L	T	P	C
-	-	-	**0.5**

17AEE42 COMPREHENSIVE ONLINE EXAMINATION

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE43 HVDC & FACTS

Course Outcomes :

After completion of the course student will be able to

1. Explain different types of HVDC levels and basic concepts and operation of converters.
2. Develop skills in HVDC converter and the harmonic effects.
3. Define power flow control in transmission line using FACTS controllers.
4. Select methods of compensation and operation of combined controllers.
5. Analyze the different harmonics generated by the converters and their variation with the change in firing angles.

UNIT - I

BASIC CONCEPTS AND ANALYSIS OF HVDC SYSTEM: Terminal equipment of HVDC transmission systems-Types of HVDC Links- Comparison of AC & DC Transmission-Applications-Pulse number – Choice of converter configuration-Analysis of Graetz circuit with and without overlap -Analysis of a 12 pulse converter.

UNIT - II

HVDC CONVERTER CONTROL AND HARMONICS: Principles of DC link control – Converter control characteristics –Firing angle control – Current and extinction angle control – Generation of harmonics –Calculation of voltage and current harmonics-Types of filters.

UNIT - III

INTRODUCTION TO FACTS: Power flow in an AC System – Loading capability limits – Dynamic stability considerations – Importance of controllable parameters – Basic types of FACTS controllers – Benefits from FACTS controllers – Requirements and characteristics of high power devices – Voltage and current rating – Losses and speed of switching – Parameter trade–off devices.

UNIT - IV

SHUNT& SERIES COMPENSATORS: Objectives of shunt and series compensation – Mid–point voltage regulation for line segmentation – End of line voltage support to prevent voltage instability – Improvement of transient stability – Power oscillation damping-Basic operating principles of SSSC & STATCOM, Applications on transmission lines.

UNIT - V

COMBINED CONTROLLERS: Schematic and basic operating principles of Unified Power Flow Controller (UPFC) & IPFC– Application on transmission lines.

TEXT BOOKS:

1. Padiyar, K.R, HVDC Power Transmission Systems, New Age International *(P)* Limited, 3rd Edition, 2015.
2. Narain G. Hingorani, Understanding FACTS: Concepts and Technology of Flexible AC Transmission Systems, Laszlo Gyugyi the Institute of Electrical and Electronics Engineers, Inc. 2013.

REFERENCES:

1. K R Padiyar, FACTS Controllers in Power Transmission and Distribution, New Age International Publishers, 2007.
2. E.W.Kimbark, High Voltage Direct Current Transmission, John Wiley & Sons, Inc., Vol. 1, 1971.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	1	-	3	-	-	-	1	1	3	3	1
CO2	3	2	3	2	1	-	3	-	-	-	1	1	3	3	1
CO3	3	2	3	2	1	-	3	-	-	-	1	1	3	3	1
CO4	3	2	3	2	1	-	3	-	-	-	1	1	3	3	1
CO5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE44 POWER SYSTEM OPERATION & CONTROL

Course Outcomes :

After completion of the course student will be able to

1. Apply optimum solution for generators operation and hydro-thermal scheduling problems.
2. Select output parameters variation of the generating system by the modeling of turbine and governor system.
3. Apply the solution for load frequency control of an isolated power system and two area system also.
4. Apply different types of compensating schemes for transmission systems.
5. Interpret impact of load frequency control and voltage control.

UNIT - I

ECONOMIC OPERATION OF POWER SYSTEMS: Optimal operation of Generators in Thermal Power Stations - Heat rate curve – cost curve – Incremental fuel and Production costs, Input-Output characteristics, Optimum generation allocation with line losses neglected, Optimum generation allocation including the effect of transmission line losses – Loss Coefficients, General transmission line loss formula.

UNIT - II

HYDROTHERMAL SCHEDULING: Optimal scheduling of Hydrothermal System - Hydroelectric power plant models - Scheduling problems - Short term and Long term Hydrothermal scheduling problem.

UNIT - III

MODELING OF TURBINE AND GOVERNOR: Modeling of Turbine - First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models - Modeling of Governor- Mathematical Modeling of Speed Governing System – Derivation of small signal transfer function – Block Diagram.

UNIT - IV

LOAD FREQUENCY CONTROL : Necessity of keeping frequency constant - Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case. Proportional plus Integral control of single area and its block diagram representation - steady state response – Load Frequency Control and Economic dispatch control - Load frequency control of two Area system – uncontrolled case and controlled case, tie-line bias control.

UNIT - V

REACTIVE POWER CONTROL: Overview of Reactive Power control – Reactive Power compensation in transmission systems – Advantages and disadvantages of different types of compensating equipment for transmission systems - load compensation – Specifications of load compensator - Uncompensated and compensated transmission lines - shunt and Series Compensation.

TEXT BOOKS:

1. Chakravarthi. A and Halder.S, Power System Analysis Operation and Control, PHI, 3rd Edition, 2010.
2. Nagrath.I.J & Kothari.D.P, Modern Power System Analysis, Tata M Graw – Hill Publishing Company Ltd, 3rd Edition, 2003.

REFERENCE BOOKS:

1. Duncan Glover. J and Sarma. M.S, Power System Analysis and Design, Brooks/Cole Publishing Co, 4th Edition, 2008.
2. Nasar.S.A, Electric Power Systems, Schaum's Outline Series TMH, Revised 1st Edition, 1989.
3. Singh.S.N, Electric Power Generation, Transmission and Distribution, PHI, 2nd Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	3	1	-	1	-	-	1	-	-	-	3	2	1
CO2	3	2	3	1	-	1	-	-	1	-	-	-	3	2	1
CO3	3	3	3	2	-	2	-	-	1	-	-	-	3	2	1
CO4	3	3	3	1	-	1	-	-	1	-	-	-	3	2	1
CO5	3	2	2	1	--	1	-	-	1	-	-	-	3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	1	-	3

17AEE45 ADVANCED CONTROL SYSTEMS

Course Outcomes :

After completion of the course student will be able to

1. Define control system design, tuning of PID controller and Two-Degrees-of-Freedom control, non-linear system stability, Modal and optimal control.
2. Analyze stability of a non-linear system using describing functions and phase plane analysis, non-linear system stability using Lyapunov's stability criterion, Minimization of functional with different cases.
3. Demonstrate design skills in compensators and controllers using Root locus and Bode plot, controllers, observer and regulators using state space.
4. Demonstrate problem solving skills in evaluating stability of systems using describing functions and liapunov stability.
5. Formulate different types of analysis in frequency domain to explain the nature of stability of the system

UNIT-I

STATE SPACE ANALYSIS: Review of State Space Representation - Canonical Forms: Controllable Canonical Form - Observable Canonical Form - Jordan Canonical Form.

UNIT-II

CONTROLLABILITY AND OBSERVABILITY: Tests for controllability and observability for continuous time systems – Controllable Phase Variable form and Observable Phase Variable form - Design of State Feedback Control through Pole placement - Full order observer and reduced order observer.

UNIT-III

ANALYSIS OF NON-LINEAR SYSTEMS: Introduction to nonlinear systems - Types of nonlinearities - Describing functions - Describing function analysis of nonlinear control systems - Introduction to phase-plane analysis - Method of Isoclines & Delta for Constructing Trajectories - singular points - phase-plane analysis of nonlinear control systems.

UNIT-IV

STABILITY ANALYSIS: Stability in the sense of Lyapunov - Lyapunov's stability and Lypanov's instability theorems - Direct method of Lyapunov for the Linear and Nonlinear continuous time autonomous systems.

UNIT-V

OPTIMAL CONTROL: Introduction to optimal control, formulation of optimal control problems, calculus of variations, minimization of functional of single function, functional involving n independent functions, constrained minimization.

TEXT BOOKS:

1. Gopal.M, Modern Control System Theory, New Age International (P) Ltd, 2nd edition, 1996.

REFERENCES:

1. Ogata.K, Modern Control Engineering, Prentice Hall of India, 5th edition, 1998
2. Nagarath.I.J and Gopal.M, Control Systems Engineering, New Age International (P) Ltd, 2017.
3. Nagoor Kani, Advanced Control Systems, RBA Publications, 2nd Edition, 2014.
4. Stainslaw H. Zak, Systems and Control, Oxford Press, 2nd Edition, 2003.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	-	-	-	-	1	1	3	2	1
CO2	3	3	3	1	-	1	-	-	-	-	1	1	3	2	1
CO3	3	3	3	1	-	1	-	-	-	-	1	1	3	2	1
CO4	3	3	3	1	-	1	-	-	-	-	1	1	3	2	1
CO5	3	3	3	1	-	1	-	-	-	-	1	1	3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE38 EMBEDDED SYSTEMS TECHNOLOGIES

(Professional Elective – III)

Course Outcomes :

After completion of the course student will be able to

1. Define fundamental concepts of Embedded systems.
2. Explain state machine models and concurrent process models.
3. Describe watch dog timer, real time clock and communication interfaces.
4. Explain the RTOS and Kernel.
5. Use the hardware and software design.

UNIT-I

INTRODUCTION: 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, 1st Edition, 2000.
2. David E. Simon, An Embedded Software Primer, Pearson Ed., 2005.
3. Raj Kamal, Introduction to Embedded Systems, TMS, 2002.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO2	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO3	3	3	2	1	-	1	2	-	2	1	-	-	3	2	3
CO4	3	2	2	2	-	2	2	-	2	1	-	-	3	2	3
CO5	2	2	2	2	2	2	2	2	2	2	-	-	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE46 POWER SYSTEM DEREGULATION

(Professional Elective – III)

Course Outcomes :

After completion of the course student will be able to

1. Explain concepts of :
   - deregulated power systems.
   - issues in electricity market models and their functions in different scenarios.
   - Electricity pricing methods and ancillary service management in competitive market.
2. Predict market models to provide power exchange among various entities of deregulatedpower system.
3. Employ the forecasting methods for minimizing the energy price, transmission losses and to regulate impediment in tie-lines of interconnected deregulated power system.

UNIT - I

DEREGULATION OF ELECTRIC UTILITIES: Introduction – Traditional central utility model, reform motivations, separation of ownership and operation, competition and direct access in the electricity market, independent system operator (ISO), retail electric providers, different experiences.

UNIT - II

COMPETITIVE WHOLESALE ELECTRICITY MARKETS & TRANSMISSION OPEN ACCESS: Introduction, ISO, wholesale electricity market characteristics, market model, challenges. Transmission open access: Trading arrangements - the pool and bilateral trade - multilateral trades, congestion management.

UNIT - III

TRANSMISSION COST ALLOCATION METHODS: Introduction, Postage Stamp Rate Method - Contract Path Method - MW-Mile Method – Unused Transmission Capacity Method - MVA-Mile method – Comparison of cost allocation methods.

UNIT - IV

MARKET POWER & ANCILLARY SERVICES MANAGEMENT: Market power Introduction - different types of market Power, mitigation of market power – Examples. Ancillary services - Introduction, reactive power as an Ancillary Service – a review, synchronous generators as ancillary service providers.

UNIT-V

TRANSFER CAPABILITY CALCULATIONS AND ELECTRICITY PRICING: Transfer Capability calculations: definitions, transfer capability calculations – ATC, TTC, TRM, CBM calculations. Calculation of ATC based on power flow.

Electricity Pricing: Introduction, electricity price volatility, electricity price indexes, challenges to electricity pricing, construction of forward price curves, short-time price forecasting.

TEXT BOOKS:

1. Loi Lei Lai, Power System Restructuring and Deregulation, John Wiley & Sons Ltd., England, 1st Edition, 2001.
2. Mohammad Shahidehpour and Muwaffaq Alomoush, Restructured Electrical Power Systems, Marcel Dekker, Inc., New York, 1st Edition, 2001.

REFERENCE BOOKS:

1. Kankar Bhattacharya, Math H.J. Boller and JaapE.Daalder, Operation of Restructured Power System, Kulwer Academic Publishers, 1st Edition, 2001.
2. P.Venkatesh, B.V.Manikandan, S.Charles Raja and A.Srinivasan, Electrical Power Systems Analysis, Security and Deregulation, PHI Publishers, 2nd Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	-	1	1	-	1	-	-	-	3	2	3
CO2	3	3	2	1	-	1	1	-	1	-	-	-	3	2	3
CO3	3	3	2	1	-	1	1	-	1	-	-	-	3	2	3
CO4	3	2	2	2	-	1	1	-	1	-	-	-	2	2	2
CO5	2	2	2	2	-	1	1	-	2	2	-	-	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE65 POWER QUALITY

(Professional Elective – III)

Course Outcomes :

After completion of the course student will be able to

1. Address power quality issues to ensure meeting of power quality standards
2. Apply the concepts of compensation for sags and swells using voltage regulating devices
3. Analyze the causes & Mitigation techniques of various Power quality events.
4. Assess harmonic distortion and its mitigation.
5. Apply compensation techniques.

UNIT I INTRODUCTION

Definition of Power Quality- Power Quality Terminology – Classification of Power Quality Issues-Magnitude Versus Duration Plot - Power Quality Standards - Responsibilities of Suppliers and Users of Electric Power-CBEMA and ITI Curves.

UNIT II TRANSIENTS, SHORT DURATION AND LONG DURATION VARIATIONS

Categories and Characteristics of Electromagnetic Phenomena in Power Systems-Impulsive and Oscillatory Transients-Interruption - Sag-Swell-Sustained Interruption - Under Voltage – Over Voltage–Outage. Sources of Different Power Quality Disturbances- Principles of Regulating the Voltage- Conventional Devices for Voltage Regulation.

UNIT III FUNDAMENTALS OF HARMONICS & APPLIED HARMONICS

Harmonic Distortion, Voltage Versus Current Distortion, Harmonics Versus Transients, Power System Quality Under Non Sinusoidal Conditions, Harmonic Indices, Harmonic Sources from Commercial Loads, Harmonic Sources from Industrial Loads. Applied Harmonics**:** Effects Of Harmonics, Harmonic Distortion Evaluations, Principles of Controlling Harmonics, Devices for Controlling Harmonic Distortion.

UNIT-IV POWER QUALITY MONITORING

Power Quality Benchmarking-Monitoring Considerations- Choosing Monitoring Locations-Permanent Power Quality Monitoring Equipment-Historical Perspective of Power Quality Measuring Instruments- Power Quality Measurement Equipment-Types of Instruments-Assessment of Power Quality Measurement Data- Power Quality Monitoring Standards.

UNITV POWER QUALITY ENHANCEMENT USING CUSTOM POWER DEVICES

Introduction to Custom Power Devices-Network Reconfiguring Type: Solid State Current Limiter (SSCL)-Solid State Breaker (SSB) -Solid State Transfer Switch (SSTS) - Compensating Type: Dynamic Voltage Restorer (DVR)-Unified Power Quality Conditioner(UPQC)-Principle of Operation Only.

TEXT BOOKS:

1. Electrical Power Systems Quality, Roger C. Dugan, Mark F. McGranaghan, Surya Santoso,
2. H.Wayne Beaty, Mc Graw Hill Education (India) Pvt. Ltd., 3rd Edition, 2012. Power quality, C. Sankaran, CRC Press, 2001.

REFERENCE BOOKS:

1. Understanding Power quality problems – Voltage Sags and Interruptions, Math H. J. Bollen IEEE Press Series on Power Engineering, WILEY, 2007.
2. Power quality – VAR Compensation in Power Systems, R. Sastry Vedam, Mulukutla S. Sarma, CRC Press, 2009, First Indian Reprint 2013.
3. Fundamentals of Electric Power Quality, Surya Santoso, Create Space, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	-	1	-	1	-	1	1	3	2	1
CO2	3	3	3	1	-	-	1	-	1	-	1	1	3	2	1
CO3	3	3	3	1	-	-	1	-	1	-	1	1	3	2	1
CO4	3	3	3	1	-	-	1	-	1	-	1	1	3	2	1
CO5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE48 DISTRIBUTION SYSTEM AUTOMATION

(Professional Elective – III)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge of Distribution system planning in future, automation and distribution systems protection
2. Evaluate the Technical and Economic benefits of Distribution Automation
3. Select the best capacitor location for power factor improvement and optimum capacitor allocation.
4. Design the different types of primary and secondary distribution feeders.
5. Evaluate the fault currents, voltage drop and power loss in distribution lines.

UNIT -I

DISTRIBUTION SYSTEM PLANNING AND AUTOMATION: Introduction - Distribution Planning – Facts affecting system planning - present distribution system planning techniques – distribution system planning models – Distribution system planning in the future – Future nature of Distribution planning – The central role of the computer in distribution planning – distribution system automation.

UNIT -II

DESIGN CONSIDERATION OF PRIMARY AND SECONDARY SYSTEMS: Introduction – Primary network – Primary feeder voltage levels – Primary feeder loading – Tie lines – the design of radial Primary distribution systems – Primary systems costs – introduction – secondary voltage levels – The present design practice – secondary Banking – the secondary networks – Economic Design of Secondories.

UNIT -III

VOLTAGE DROP AND POWER LOSS CALCULATIONS: Three Phase Balanced Primary Links – non three phase primary Lines – four wire multi grounded common neutral distribution system – A method to analyze distribution costs – Economic analysis of Equipment losses.

UNIT -IV

APPLICATION OF CAPACITORS TO DISTRIBUTION SYSTEMS: Power Capacitors – effects of series and shunt capacitors – power factor correction – Economic justification for capacitors - A practical procedure to determine the best capacitor location – A mathematical procedure to determine the optimum capacitor allocations.

UNIT -V

DISTRIBUTION SYSTEM PROTECTIONS: Basic definitions – over current protections devices – objective of Distributions system protection – coordination of protective devices – fuse to – fuse coordinator – Recloser to Recloser coordinator – Recloser to fuse coordinators – Fuse to circuit breaker coordinator – Recloser to coordinators fault current calculations.

TEXT BOOKS:

1. Turan Gonen, Electric Power Distribution System Engineering, CRC Press publication, 2nd Edition, 2007.
2. A.S Publa, Electric Power Distribution, Tata Mc Graw – Hil Publishing Company Ltd, 4th edition, 2001.

REFERENCE BOOKS:

1. S.Sivanagaraju, V.Sankar, Electrical Power Distribution and Automation, Dhanapat Rai & Co, Reprint 2010.
2. V.K.Mehatha, Principles of power system, S Chand publication, 2nd Edition, 2005.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	2	1	-	3	0	-	-	1	1	3	3	1
CO2	3	2	3	2	1	-	3	0	-	-	1	1	3	3	1
CO3	3	2	3	2	1	-	3	0	-	-	1	1	3	3	1
CO4	3	2	3	2	1	-	3	0	-	-	1	1	3	3	1
CO5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE49 VLSI DESIGN FOR ELECTRICAL SYSTEMS

(Professional Elective – III)

Course Outcomes :

After the completion of the course the students shall be able to

1. Analyze the Basic CMOS Circuits
2. Apply CMOS Process Technology.
3. Apply the Techniques Of Chip Design Using Programmable Devices.
4. Apply the Digital System Using Hardware Description Language.
5. Choose the different types of Electrical system applications

UNIT I MOS TRANSISTOR PRINCIPLE

NMOS And PMOS Transistors, Process Parameters For MOS And CMOS, Electrical Properties Of CMOS Circuits And Device Modeling, Scaling Principles And Fundamental Limits, CMOS Inverter Scaling, Propagation Delays, Stick Diagram, Layout Diagrams

UNIT II COMBINATIONAL LOGIC CIRCUITS

Examples Of Combinational Logic Design, Elmore's Constant, Pass Transistor Logic, Transmission Gates, Static And Dynamic CMOS Design, Power Dissipation – Low Power Design Principles

UNIT III SEQUENTIAL LOGIC CIRCUITS

Static And Dynamic Latches And Registers, Timing Issues, Pipelines, Clock Strategies, Memory Architecture And Memory Control Circuits, Low Power Memory Circuits, Synchronous And Asynchronous Design

UNIT IV DESIGNING ARITHMETIC BUILDING BLOCKS

Data Path Circuits, Architectures For Ripple Carry Adders, Carry Look Ahead Adders, High Speed Adders, Accumulators, Multipliers, Dividers, Barrel Shifters, Speed And Area Tradeoff

UNIT V IMPLEMENTATION STRATEGIES

Full Custom And Semi Custom Design, Standard Cell Design And Cell Libraries, FPGA Building Block Architectures, FPGA Interconnect Routing Procedures.

TEXTBOOKS:

1. Jan Rabaey, Anantha Chandrakasan, B.Nikolic, "Digital Integrated Circuits: A Design Perspective", Second Edition, Prentice Hall Of India, 2003.
2. M.J. Smith, "Application Specific Integrated Circuits", Addisson Wesley, 1997.
3. N.Weste, K.Eshraghian, "Principles Of CMOS VLSI Design", Second Edition, Addision Wesley 1993

REFERENCE BOOKS:

1. R.Jacob Baker, Harry W.LI., David E.Boyee, "CMOS Circuit Design, Layout And Simulation", Prentice Hall Of India 2005
2. A.Pucknell, Kamran Eshraghian, "BASIC VLSI Design", Third Edition, Prentice Hall Of India, 2007.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	-	1	-	-	1	-	-	1	3	2	1
CO2	3	3	3	1	-	1	-	-	1	-	-	1	3	2	1
CO3	3	3	3	1	-	1	-	-	1	-	-	1	3	2	1
CO4	3	3	3	1	-	1	-	-	1	-	-	1	3	2	1
CO5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE50 DESIGN OF ELECTRICAL SYSTEMS

(Professional Elective – IV)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on industrial and domestic electrical installations.
2. Understand the design considerations of electrical installations.
3. Design the different types of power system earthing.
4. Design electrical installation for buildings and small industries.
5. Apply various techniques for energy economics, depreciation and taxes.

UNIT I

DESIGN ASPECTS OF ELECTRICAL SYSTEMS AND DOMESTIC BUILDINGS: Role of Statutes in Electrical System Design - Classification of Building Services - Design Aspects of Lighting - Design Aspects of Ventilation - Design Aspects of Climate Control - Design Aspects of Vertical Transportation - Design Aspects of Minor Building Services. Classification Of Domestic buildings - Estimation of Load Requirements - Selection of Type of Wiring - Special Features Applicable for High -Rise Apartment Buildings - Pre-commissioning Tests.

UNIT II

INDUSTRIAL INSTALLATIONS: Classification of Industrial Installation - General Characteristics - Selection of Distribution Architecture - Selection of Transformers and Sub Stations. Short Circuit Studies - Fault Current Calculations - Earthing Design - Selection of Switch Gears - Electrical Protection, Protection of Circuit Elements, Persons & Life stack, Equipment, Electrical Isolation, Switch Gear Control, Switching Devices, Uses, Selective Co-ordination, Circuit Breakers and their Selection..

UNIT III

POWER SYSTEM EARTHING: Introduction – Earthing - Types of System Earthing - Reasons for Grounding/ Earthing - TN System, TT System, IT System, Protective Measures and Protective Devices in IT System - Main Characteristics of Earthing Systems - Selection Criteria

for Earthing - Design Considerations of Earthing - Measurement of Earth Resistance - Earth Leakage Protection - Neutral Earthing for Generators and Transformers.

UNIT IV

POWER QUALITY ISSUES AND RESONANCE PROBLEMS IN SYSTEMS DESIGN: Power Quality Issues - Harmonics, Sources of Harmonics - Disturbances Caused by Harmonics - Methods to reduce the Impact of Harmonics - Design the Detuned Capacitor Bank - IEEE Standard 519-1992 and Limits. Economics of Power Factor Improvement, Optimal Compensation, PF Correction of Induction Motors.

UNIT V

ENERGY ECONOMICS IN SYSTEM DESIGN: Introduction - Time Value of Money - Single Payment Compound Amount Model (SPCA) - Uniform Series Compound Amount Model (USCA) - Uniform Series Present Worth Model (USPW) - Depreciation, Tax Considerations - After Tax Analysis.

TEXT BOOKS:

1. Giridharan, M.K, Electrical Systems Design, I. K. International Publishing House Pvt. Ltd, 3rd Edition, 2015.
2. Raina, K.B and Bhattacharya, Electrical Design Estimating and Costing, New Age International Publishers 2nd Edition, 2017.

REFERENCE BOOKS:

1. Turan Gonen, Electric Power Distribution Engineering, CRC Press, 3rd Edition, 2014.
2. Er. Jain ,V. K.and Er. Amitabh Bajaj, Design of Electrical Installations, University Science Press, Reprint 2016.
3. Gupta,J.B., A Course in Electrical Installation Estimating & Costing, Katson Books, Reprint, 2013.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	1	0	1	-	-	-	-	1	1	3	2	1
CO2	3	3	3	1	0	1	-	-	-	-	1	1	3	2	1
CO3	3	3	3	1	0	1	-	-	-	-	1	1	3	2	1
CO4	3	3	3	1	0	1	-	-	-	-	1	1	3	2	1
CO5	3	3	3	1	0	1	-	-	-	-	1	1	3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE51 ADVANCED POWER SYSTEM PROTECTION

(Professional Elective – IV)

Course Outcomes :

After completion of the course student will be able to

1. Apply different static relays in the protection of power systems
2. Apply the static relay schemes for protection of power transformers, power lines
3. Conduct investigation on the performance of distance relays in the power systems
4. Apply the microprocessor-based protection schemes
5. Compare with conventional relay schemes.

UNIT-I

STATIC RELAYS: Basic construction of static relays – Advantages of static relays- Level detectors – Replica impedance-mixing circuits-general equation for two input phase and amplitude comparators –Duality between amplitude and phase comparator. Different kinds of amplitude comparators and phase comparators.

UNIT-II

STATIC OVER CURRENT RELAYS: Introduction-Instantaneous over current relay – Time over current relays-basic principles-Definite time and Inverse definite time over current relays.

UNIT-III

STATIC DIFFERENTIAL RELAYS: Analysis of static differential relays – static relay schemes –Duo bias transformer differential protection – Harmonic restraint relay. Static distance Relays: Static impedance –reactance-MHO and angle impedance relay sampling comparator– realization of reactance and MHO relay using a sampling comparator

UNIT-IV

POWER SWINGS: Effect of power swings on the performance of Distance relays- Power swing analysis – Principle of out of step tripping and blocking relays – effect of line length and source impedance on distance relays.

UNIT-V

MICROPROCESSOR BASED PROTECTIVE RELAYS: Over current relays – impedance

relays – directional relay – reactance relay- Generalized mathematical expression for distance relays - measurement of resistance and reactance, MHO and offset MHO relays.

TEXT BOOKS:

1. T.S.Madhava Rao, Power system Protection static relay, Tata McGraw Hill Publishing company limited, 2nd Edition, 1989.
2. Badri Ram and D.N.Vishwa karma, Power system Protection and Switchgear, Tata McGraw Hill Publication company limited, 1st Edition, 1995.

REFERNCE BOOKS:

1. Y.G. Pythankar, Advanced Power System Protection, published by PHI Learning Private Ltd, 2nd Edition, 2010.
2. Wadhwa.C.L, Electrical Power Systems, New Age international (P) Limited, 11th Edition, 2017.
3. Sunil.S.Rao, Switchgear and Protection, Khanna Publlishers, 13th Edition, 2008.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO2	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO3	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO4	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO5	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE52 EHV AC TRANSMISSION

(Professional Elective – IV)

Course Outcomes :

After completion of the course student will be able to

1. Analyze various parameters in EHV AC transmission.
2. Examine key advantages and applications of EHVAC system.
3. Analyze the line parameters in EHVAC Transmission line
4. Analyze the concept of Corona and its effect on transmission line and travelling wave theory phenomenon.
5. Estimate statistical procedures for line designs.

UNIT-I

INTRODUCTION: Necessity of EHV AC transmission – Advantages and problems – Standard transmission voltages-Average values of line parameters- power handling capacity and line losses – Cost of transmission lines and equipment - Mechanical considerations.

UNIT-II

CALCULATION OF LINE PARAMETRS: Resistance of conductors-Properties of bundled conductors-Inductance and Capacitance of EHV line configuration-Sequence inductances and capacitances-Line parameters for modes of propagation.

UNIT-III

VOLTAGE GRADIENTS OF CONDUCTORS: Field of line charges and properties – Charge Potential relations for multi-conductors – Surface voltage gradient on conductors – Distribution of voltage gradient on sub-conductors of bundle.

UNIT-IV

CORONA EFFECTS: Power loss and corona loss - Corona loss formulae –Attenuation of travelling waves due to corona loss – Audible noise: Generation, characteristics and limits-AN measurement and meters – Measurement of RI, RIV and excitation functions.

UNIT-V

ELECTRO STATIC FIELD OF EHV LINES: Calculation of electrostatic field of AC lines – Effect of high electrostatic field on humans, animals and plants – Electrostatic induction in unenergised circuit of double circuit line.

DESIGN OF EHV LINES: Based on steady state limits with design examples.

TEXT BOOKS:

1. Rokosh Das Begamudre, Extra High Voltage AC Transmission Engineering, New age international (P) Ltd., publishers, 3rd Edition, 2009.
2. Shobhit Gupta, Deepak Gupta, EHV AC/DC Transmission, Published by Genius Publications, 2014.

REFERENCES:

1. Sunil S.Rao, EHV-AC HVDC Transmission & Distribution Engineering, Khanna Publishers, 3rd Edition, 2008.
2. A. Chakrabarti , D. P. Kothari and A. K. Mukhopadhyay, Performance, Operation and Control of EHV Power Transmission System, A H Wheeler Publishing Co Ltd, 1999.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	3	2	--	--	2	--	--	--	--	2	2	2
CO2	3	2	2	2	2	--	--	2	--	--	--	--	3	1	2
CO3	2	2	1	2	1	--	--	1	--	--	--	--	2	2	1
CO4	3	1	--	1	--	--	--	--	--	--	--	--	3	3	--
CO5	3	3	2	3	2	-	-	2	-	-	-	-	3	1	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE53 ENERGY AUDITING & MANAGEMENT

(Professional Elective – IV)

Course Outcomes :

After completion of the course student will be able to

1. Demonstrate knowledge on energy auditing practices, energy conservation schemes and
2. Define Energy management concepts, analyze various energy instruments, payback analysis, and depreciation,taxes and tax credit.
3. Design good lighting system for conservation of energy.
4. Explain demand side management practices.

UNIT- I

INTRODUCTION OF ENERGY AUDITING: Introduction-Energy situation in world and India, energy consumption, conservation, Codes, standards and Legislation. - Energy audit- Definitions, concept, types of audit, energy index, cost index, pie charts, Sankey diagrams, load profiles, Energy conservation schemes. Measurements in energy audits, presentation of energy audit results.

UNIT- II

ENERGY EFFICIENT MOTORS: Energy efficient motors- factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed , variable duty cycle systems, RMS hp- voltage variation-voltage unbalance- over motoring- motor energy audit, power factor motor controllers.

UNIT- III

LIGHTING AND ENERGY INSTRUMENTS: Good lighting system design and practice, lighting control ,lighting energy audit - Energy Instruments- wattmeter, data loggers, thermocouples, pyrometers, lux meters, tongue testers , application of Programmable Logic Control(PLC).

UNIT- IV

ENERGY ECONOMIC ANALYSIS: The time value of money concept, developing cash flow models, payback analysis, depreciation, taxes and tax credit – numerical problems.

UNIT- V

DEMAND SIDE MANAGEMENT: Introduction to DSM, concept of DSM, Benefits of DSM, different techniques of DSM – Time of day pricing, Multi-utility power exchange model, time of day models for planning, Load priority technique, peak clipping, peak shifting, valley filling, strategic conservation, energy efficient equipment, Management and Organization of Energy Conservation awareness Programs.

TEXT BOOKS:

1. Paul.O, Callaghan, Energy management, Mc-graw Hill Book Company, 1st Edition, 1998.
2. Murphy, W.R. and Mckay, G.., Energy management, Butter worth publications, 1st Edition,1982.

REFERENCE BOOKS:

1. John .C. Andreas, Energy efficient electric motors, Marcel Dekker Inc Ltd, 2nd Edition, 1995.
2. Arry, C. White, Philip S. Schmidt, David. R,Brown, Industrial Energy management Systems, Hemisphere Publishing Corporation, New York , 1st Edition, 1994.
3. Pabla, A.S., Electrical Power Distribution, TMH Publishers, 5th Edition, 2004.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	2	2	--	--	2	--	--	--	--	2	2	2
CO2	3	3	2	2	2	--	--	2	--	--	--	--	3	1	3
CO3	2	2	2	2	1	--	--	1	--	--	--	--	2	2	2
CO4	3	3	1	1	--	--	--	--	--	--	--	--	3	3	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE55 RELIABILITY ENGINEERING AND APPLICATIONS TO POWER SYSTEMS

(Professional Elective – IV)

Course Outcomes :

After completion of the course student will be able to

1. demonstrate knowledge on
   - elements of probability theory and probability distributions
   - types of failures, reliability block diagram reductions
   - network reduction techniques and markov modeling
   - generation and load modeling
   - frequency and duration techniques
   - distribution system reliability indices
2. analyze
   - the failure rate distributions
   - the network reduction techniques
   - methods for identifying critical components
   - cumulative probability cumulative frequencies
   - generation system, customer, load and energy-oriented indices
3. evaluate the power system networks using reliability concepts for adequacy and security

UNIT – I

PROBABILITY THEORY: Introduction - rules for combining probabilities of events – bernoulli's trials, probability density and distribution functions - examples. Probability Distributions - discrete distributions - binomial distribution, poisson distribution. Continuous distributions - exponential distribution, weibull distribution and normal distribution - mean, standard deviation, variance - examples.

UNIT – II

NETWORK MODELLING AND RELIABILITY FUNCTIONS: Reliability block diagrams – series, parallel systems and combined series-parallel systems - examples. Reliability evaluation of non-series-parallel systems - decomposition method, cut-set method - deduction of the

minimal cut-sets from the minimal paths, tie-set method – examples. Concept of redundancy - standby redundant systems, perfect switching, imperfect switching.

Reliability analysis of series parallel networks using exponential distribution .Reliability functions f(t), F(T), R(T), H(T) and their relationships, bath tub curve, reliability measures - MTTF, MTTR, MTBF.

UNIT–III

MARKOV MODELLING AND FREQUENCY AND DURATION TECHNIQUES: Markov chain – concept of stochastic transitional probability matrix (STPM), evaluation of limiting state probabilities. Markov processes - time dependent probability evaluation – evaluation of limiting state probabilities using STPM – one, two component repairable models. Frequency and duration concept – evaluation of frequency of encountering state for one, two component repairable models – evaluation of cumulative probability and cumulative frequency of encountering of merged states.

UNIT–IV

GENERATION SYSTEM RELIABILITY ANALYSIS: Generation system reliability analysis - reliability model of a generation system – recursive relation for unit addition and removal. Load modeling - merging of generation load model – evaluation of transition rates for merged state model – cumulative probability, cumulative frequency of failure evaluation – LOLP, LOLE, LOEE - numerical problems.

UNIT–V

COMPOSITE SYSTEM AND DISTRIBUTION SYSTEM RELIABILITY ANALYSIS: Transmission system reliability analysis - system and load point reliability indices weather effects on transmission lines, weighted average rate and Markov model, Distribution system reliability analysis - radial networks – evaluation of basic reliability indices, performance indices – load point and system reliability indices – customer oriented, loss and energy oriented indices - numerical problems.

TEXT BOOKS:

1. Roy Billinton and Ronald N Allen, Reliability Evaluation of Engineering Systems, Springer, 2nd Edition, 2007.
2. Roy Billinton and Ronald N Allen, Reliability Evaluation of Power Systems, Springer, 2nd Edition, 2007.

REFERENCE BOOKS:

1. V. Sankar, System Reliability Concepts, Himalaya Publishing House, 2015.
2. Charles E. Ebeling, An Introduction to Reliability and Maintainability Engineering, Tata McGraw-Hill, 2000.
3. E. Balagurusamy, Reliability Engineering, Tata McGraw Hill, 2003.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	--	--	2	2	--	--	--	--	--	2	2	2
CO2	3	2	2	--	--	2	2	--	--	--	--	--	3	1	2
CO3	2	2	1	--	--	1	1	--	--	--	--	--	2	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AME56 OPTIMIZATION TECHNIQUES

(Open Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Summarize various LPP,TPP, AP, sequencing, replacement, game theory, project management, queuing models of operations Research.
2. Illustrate the application of OT models 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.

UNIT-I

Development – definition – characteristics and phases – types of Operations Research models – applications – limitations.

LINEAR PROGRAMMING AND ITS APPLICATIONS: Linear Programming Problem – Graphical solution of LP Problems. Simplex method – artificial variables techniques - Two phase method,- Big M method.

UNIT-II

TRANSPORTATION: Introduction – Methods of basic feasible solution, Optimality test, Degeneracy in transportation problem, unbalanced transportation Problem, --

ASSIGNMENT PROBLEM: Introduction – un balanced model -- optimal solution – Hungarian method, - un-balanced assignment problems- travelling salesman problem.

UNIT-III

THEORY OF GAMES: Introduction – mini, max (max, mini) – criterion and optimal strategy-- to solve the rectangular two person zero sum games, solution of rectangular games in terms of mixed strategies, solution of 2x2 games without saddle point, solution of a two person zero sum 2Xn game, Graphical method for 2Xn and nX2 games.

REPLACEMENT: Introduction – replacement of items that deteriorate with time – when money value is not counted and counted – replacement of items that fail completely, group replacement.

UNIT-IV

WAITING LINES: Introduction, single channel, Poisson arrival, exponential service time with finite population and infinite population –

SIMULATION: Definition – types of simulation models – phases of simulation – application of simulation – inventory and queuing problems – merits and demerits -- simulation languages.

UNIT-V

PROJECT MANAGEMENT BY PERT/CPM: Introduction, simple network techniques, construction rules of drawing, Fulkerson's rules, **Critical path method (CPM)-** floats, critical path, project duration,

PERT: Introduction, different Time estimates, expected time, variance, expected project duration and probability of completion.

TEXT BOOKS:

1. Taha, Introduction to Operations Research, New Delhi, Printice Hall International Publisher, 9thEdition, 2002.
2. A.M. Natarajan, P. Blalsubramani & A Tamilarasi, Operatiaons Research, New Delhi, Pearson Piblishers, 1st Edition, 2005.

REFERENCES:

1. Hiller & Liberman, Introduction to Operations Research, Noida RC, Tata Mc Graw Hill publication, 9th Edition, 2011.
2. R. Panneerselvam, Operations Research, New Delhi, Prentice Hall International Publisher, 2nd Edition, 2006.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	--	3	--	--	--	--	--	--	2	2	2
CO2	3	2	2	2	--	2	--	--	--	--	--	--	3	3	2
CO3	2	2	2	1	--	2	--	--	--	--	--	--	1	2	1
CO4	3	1	1	--	--	2	--	--	--	--	--	--	1	3	--

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17ACS21 COMPUTER NETWORKS

(Open Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Define 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: Channel allocation Problem, Multiple Access Protocols, Ethernet- Ethernet Cabling, Ethernet MAC Sublayer Protocol. Binary Exponential Back off Algorithm, Ethernet Performance, Wireless LANs- the 802.11 Protocol Stack, Physical Layer, MAC Sublayer Protocol, 802.11 Frame Structure, Broad Band Wireless.

UNIT-III

THE NETWORK LAYER: Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, Internetworking, Network Layer in the Internet.

UNIT-IV

THE TRANSPORT LAYER: Transport Service, Elements of Transport Protocols, Internet Transport Protocols: UDP, Internet Transport Protocols: TCP.

UNIT-V

THE APPLICATION LAYER: DNS- Domain Name System, Electronic Mail. World Wide web.

NETWORK SECURITY: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms.

TEXT BOOK:

1. Andrew S. Tanenbaum, David J Wetherall, Computer Networks, Pearson Education, 5th Edition, 2011.

REFERENCE BOOKS:

1. Michael A. Gallo, William M. Hancock, Computer Communications and Networking Technologies, Cengage Learning, 1st Edition, 2001.
2. Behrouz A. Forouzan, Data Communications and Networking, Tata Mc Graw Hill, 4th Edition, 2007.
3. James F.Kurose, K.W.Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Pearson Education, 6th Edition, 2013.
4. http://nptel.ac.in/courses/106105081/1.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	3	1	-	-	-	-	-	-	-	2	-	2	-	-
CO3	3	2	3	-	1	-	-	-	-	-	2	3	2	-	-
CO4	-	1	2	1	1	-	-	-	-	-	-	2	-	1	-
CO5	-	-	-	1	1	-	-	-	-	-	-	1	-	1	-

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17ACE63 DISASTER MANAGEMENT

Course Outcomes :

After completion of the course student will 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. To 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. S L Goyal, Deep & Deep, Encyclopedia of disaster management, Vol I, II and IIIL Disaster management policy and administration, New Delhi, 2006.
3. H.N. Srivastava & G.D. Gupta, Management of Natural Disasters in developing countries, 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.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2											**3**	**2**	
CO2	3	2	3										**3**	**2**	**3**
CO3	3	1	3										**3**	**1**	**1**
CO4	3												**3**		
CO5	2	2	1										**2**	**1**	

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AME38 RELIABILITY ENGINEERING

(Open Elective – II)

Course Outcomes :

After completion of the course student will be able to

1. Apply the concepts of reliability & reliability data analysis and risk management.
2. Identify the optimum solutions with system approach to both industry and service sector.
3. Use the advanced software tools for decision making with available sources for cost reduction and profit maximization with society concern.
4. Develop a team and play a key role in decision making with interpretation skills for all round development of organization.

UNIT - I

BASICS OF PROBABILITY THEORY & DISTRIBUTION: Basic probability theory – rules for combining probabilities of events – Bernoulli's trials – probabilities density and distribution functions – binomial distribution – expected value and standard deviation of binomial distribution.

UNIT - II

RELIABILITY FUNCTION: Reliability function, failure rate, Mean time between failures (MTBF), Mean time to failure (MTTF), mortality curve, useful life availability, maintainability, system effectiveness. Introduction to probability distributions. Time to failure distributions: Exponential, normal, Gamma, Weibull; ranking of data, probability plotting techniques, Hazard plotting Concept of Bathtub Hazard Rate curve, Reliability evaluation of two-state device networks-series, parallel, k-out-of-m systems; Standby redundant systems.

UNIT - III

RELIABILITY MANAGEMENT: Reliability Management: Reliability testing: Time acceleration factor, influence of acceleration factor in test planning, application to acceleration test, high temperature operating life acceleration model, temperature humidity bias acceleration

model, temperature cycle acceleration model, vibration accelerator model, failure free accelerated test planning. Accelerated reliability growth.

UNIT - IV

RISK ASSESSMENT: Risk Assessment: Definition and measurement of risk - risk analysis techniques - risk reduction resources - industrial safety and risk assessment..

UNIT - V

RELIABILITY DETERMINATION AND PREDICTION: Reliability Determination Methods: Network reduction technique, Path tracing technique, Decomposition technique, Delta-Star method. Advanced Reliability Evaluation Concepts: Supplementary variables technique, Interference theory, Human reliability, Common cause failures, Fault trees, Failure mode and effect analysis. Reliability Prediction Models: Series and parallel systems - RBD approach - Standby systems - m/n configuration - Application of Baye's theorem - cut and tie set method - Markov analysis - FTA – Limitations

TEXT BOOKS:

1. R. Billinton, R.N.Allan, Plenum Press, Reliability Evaluation of Engg. System, New York, reprinted in India by B.S.Publications, 2007.
2. Connor P.D.T.O., Practical Reliability Engineering, John Wiley, 5th Edition, 2012.
3. Naikan V N, A Reliability Engineering and Life Testing, PHI Learning Private Limited, 1st Edition, 2009.

REFERENCE BOOKS:

1. Prabhakar Murthy D N and Marvin R, Product Reliability, Springer-Verlag, 2008.
2. Dana Crowe and Alec Feinberg, Design for Reliability, CRC Press, 2001.
3. John W Priest and Jose M Sanchez, Product Development and Design for Manufacturing, Marcel Dekker Inc., 2nd Edition, 2001.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3		3			3						**3**	**1**	
CO2	3	3	3	3									**3**	**3**	**2**
CO3	3	3	1	3			1						**2**	**3**	
CO4	3	1		3										**1**	**2**

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)
IV B.Tech – I Semester (Common to ECE, EEE, CE, MEC, CSE & IT)

L	T	P	C
3	-	-	3

17AMB03 PROFESSIONAL ETHICS

(Open Elective – II)

Course 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, Oxford University Press, 1st Edition, 2013.
2. Naagarazan , R.S., A Textbook on Professional Ethics and Human Values, New Age International (P) Limited, Publishers New Delhi., 1st Edition, 2014

REFERENCE BOOKS:

1. Edmond G Seebauer and Robert L. Barry, Fundamentals of Ethics for scientists and Engineers, Oxford University Press, 1st Edition, 2008.
2. R. R. Gaur, R. Sangal and G. P. Bagaria, Human Values and Professional Ethics, Eecel Books, New Delhi, 2010.
3. M.Govindrajan, S.Natarajan and V.S. Senthil Kumar, Professional Ethics and Human Values, PHI Learning Pvt. Ltd. Delhi, 2013.
4. Prof. D.R. Kiran, Professional Ethics and Human Values, TATA McGraw Hill Education, 2007.
5. Charles D Fleddermann, Engineering Ethics, Prentice Hall, 4th Edition, 2014.
6. Charles E Harris, Micheal J Rabins, Engineering Ethics, Cengage Learning, 5th Edition, 2014.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3											**3**	**2**	2
CO2	2	3											**3**	**2**	2
CO3	2	3											**3**	**2**	2
CO4	2	3											**3**	**2**	2
CO5	2	3											**3**	**2**	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE56 ADVANCED ELECTRIC DRIVES LAB

Course Outcomes:

After completion of the course student will be able to

1. Design semiconductor device based electrical AC and DC Drives and its applications.
2. Use Converters, Controllers and Inverters in electrical engineering applications .
3. Use PWM inverters to control domestic and industrial appliances
4. Analyze SCR, IGBT fed electrical drives

LIST OF EXPERIMENTS

1. Single phase parallel and series inverter based domestic appliances
2. Single phase half controlled converter based DC Motor
3. Single phase fully controlled converter based PMDC Motor
4. Single phase dual converter based DC Motor
5. Single phase H Bridge based IGBT Inverter based industrial appliances
6. Three phase SCR based AC Voltage controller
7. Three phase SCR based inverter for three phase AC induction motor
8. Single phase Cycloconverter for AC induction motor (α = 60 & 120, f_s = 50, f_c = 1/3 & 1)
9. Simulation of single phase AC voltage controller based induction motor
10. Simulation of three phase AC voltage controller based induction motor

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO2	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO3	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3
CO4	3	3	3	2	-	-	1	3	-	-	1	1	3	2	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
-	-	3	1.5

17AEE57 ELECTRICAL SIMULATION LAB

Course Outcomes:

After completion of the course student will be able to

1. Demonstrate knowledge about electrical circuits.
2. Simulate different types of Converters and controller for various loads using PSPICE and MATLAB.
3. Analysis of time domain, frequency domain and steady state error of second order equations.
4. Learn single and two area control and speed control of AC and DC machines.

LIST OF EXPERIMENTS

Any TEN experiments are required to be conducted:

1. PSPICE simulation of DC circuits (Thevenin's equivalent, Transfer function).
2. PSPICE simulation of transient and parameter analysis of RLC circuits to an input
   i) Pulse ii) Step and iii) sinusoidal signals
3. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB
4. Time domain analysis of second order system-Determination of time domain specifications and steady state error using MATLAB.
5. PSPICE simulation of single phase full converter using RLE loads and single phase AC voltage controller using RLE loads
6. Simulation of Dynamical systems (Single area and Two area power systems) using SIMULINK
7. Simulation of speed control of separately excited dc motor using MATLAB Simulink.
8. Simulation of single phase two level PWM inverter.
9. PSPICE Simulation of switch mode regulators
10. Analysis of 3-phase circuit representing the generator transmission line and load. Plotting three phase currents & Neutral current using PSPICE
11. Simulation of RL & RC series circuits.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	2	-	-	-	1	-	-	3	2	2
CO2	3	3	3	2	1	2	-	-	-	1	-	-	3	2	2
CO3	3	3	3	2	1	2	-	-	-	1	-	-	3	2	2
CO4	3	3	3	2	1	2	-	-	-	1	-	-	3	2	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

17AEE58 MINI PROJECT

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
-	-	-	-

17AEE59 INTERNSHIP

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE60 DISTRIBUTED GENERATION AND MICRO GRID

(Professional Elective – V)

Course Outcomes:

After completion of the course student will be able to

1. design new micro-grid with non-conventional energy sources
2. explain integration methodology and interconnectivity of Power Systems

UNIT I INTRODUCTION

Conventional power generation: advantages and disadvantages, Energy crises, Non-conventional energy (NCE) resources: review of Solar PV, Wind Energy systems, Fuel Cells, micro-turbines, biomass, and tidal sources.

UNIT II DISTRIBUTED GENERATIONS (DG)

Concept of distributed generations, topologies, selection of sources, regulatory standards/ framework, Standards for interconnecting Distributed resources to electric power systems: IEEE 1547. DG installation classes, security issues in DG implementations. Energy storage elements: Batteries, ultra-capacitors, flywheels. Captive power plants

UNIT III IMPACT OF GRID INTEGRATION

Requirements for grid interconnection, limits on operational parameters,: voltage, frequency, THD, response to grid abnormal operating conditions, islanding issues. Impact of grid integration with NCE sources on existing power system: reliability, stability and power quality issues.

UNIT IV BASICS OF A MICROGRID

Concept and definition of microgrid, microgrid drivers and benefits, review of sources of microgrids, typical structure and configuration of a microgrid, AC and DC microgrids, Power Electronics interfaces in DC and AC microgrids

UNIT V CONTROL AND OPERATION OF MICROGRID

Modes of operation and control of microgrid: grid connected and islanded mode, Active and reactive power control, protection issues, anti-islanding schemes: passive, active and communication based techniques, microgrid communication infrastructure, Power quality issues in microgrids, regulatory standards, Microgrid economics, Introduction to smart microgrids.

TEXT BOOKS:

1. Amirnaser Yezdani, and Reza Iravani, "Voltage Source Converters in Power Systems: Modeling, Control and Applications", IEEE John Wiley Publications, 2010.
2. DorinNeacsu, "Power Switching Converters: Medium and High Power", CRC Press, Taylor & Francis, 2006

3. Chetan Singh Solanki, “Solar Photo Voltaics”, PHI learning Pvt. Ltd., New Delhi,2009

REFERENCE BOOKS:

1. J.F. Manwell, J.G. McGowan “Wind Energy Explained, theory design and applications”, Wiley publication 2010.
2. D. D. Hall and R. P. Grover, “Biomass Regenerable Energy”, John Wiley, New York, 1987.
3. John Twidell and Tony Weir, “Renewable Energy Resources” Tyalor and Francis Publications, Second edition 2006.

Mapping of CO’s- PO’s-PSO’s

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	--	--	--	--	2	--	--	2	2	2
CO2	2	2	2	--	2	--	--	--	--	3	--	--	3	1	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE61 ELECTRIC VEHICLES

(Professional Elective – V)

Course Outcomes:

After completion of the course student will be able to

1. Design modern Hybrid Vehicles
2. Optimize cost and analyze about modern electric Traction and Energy Management strategies

UNIT - I

Introduction Electric Vehicles: History of Electric vehicles, social and environmental importance electric vehicles, impact of modem drive-trains on energy supplies.

UNIT – II

Conventional vehicles: Basics of vehicles performance, vehicle power source characterization, transmission characteristics, mathematical models to describe vehicle performance.

UNIT - III

Electric Drive-trains: Basic concept of electric traction, introduction to various electric drive-train topologies, power flow control in electric drive-train topologies, fuel efficiency analysis.

UNIT - IV

Electric Propulsion unit: introduction to electric components used in electric vehicles, configuration and control of DC Motor drives, configuration and control of induction Motor drives, configuration and control of permanent magnet motor drives, configuration and control of switch Reluctance Motor drives, drive system efficiently.

UNIT - V

Energy Management Strategies: introduction of energy management strategies used electric vehicles, classification of different energy management strategies, comparison of different energy management strategies, implementation issues of energy management strategies.

TEXT BOOKS:

1. Electric and Hybrid Vehicles: Design Fundamentals by Husain Iqbal
2. Advanced Hybrid and Electric Vehicles: System Optimization and Vehicle Integration
2. Hybrid Electric Vehicles: Energy Management Strategies Book by Giorgio Rizzoni and Lorenzo Serrao

REFERENCE BOOKS:

1. Hybrid Electric Vehicles: Energy Management Strategies Book by Giorgio Rizzoni and Lorenzo Serrao
2. Optimal Control of Hybrid Vehicles Novel by Bram de Jager and John Kessels

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	2	1	1	-	-	-	1	1	1	2	3	2
CO2	3	3	3	2	1	1	-	-	-	1	1	1	2	3	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE62 INDUSTRIAL DRIVES AND AUTOMATION

(Professional Elective – V)

Course Outcomes:

After completion of the course student will be able to

1. Design DC and AC drives automation its necessities control
2. Design modern controllers for DC and AC drives

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UNIT - I D C MOTOR DRIVES

Starting braking, transient analysis, single phase fully controlled rectifier, control of separately excited dc motor, Single-phase half controlled rectifier control of separately excited dc motor.

Three phase fully controlled rectifier - control of separately excited dc motor, three phase half controlled rectifier - control of separately excited dc motor, multi-quadrant operation of separately excited dc motor fed from fully controlled rectifier. Control of dc series motor, chopper controlled dc drives-separately excited dc motor and series motor.

UNIT – II AC MOTOR DRIVES

Operation with unbalanced source voltage and single phasing, operation with unbalanced rotor impedances, analysis of induction motor fed from non-sinusoidal voltage supply, starting braking, transient analysis.

Stator Voltage Control

Variable voltage and variable frequency control, voltage source inverter control, closed loop control, current source inverter control, , rotor resistance control, slip power recovery, speed control of single phase induction motors.

UNIT - III SYNCHRONOUS MOTOR DRIVES

Operation from fixed frequency supply, synchronous motor variable speed drives, variable frequency control of multiple synchronous motors. Self-controlled synchronous motor drive employing load commutated thyrister inverter.

UNIT - IV INDUSTRIAL DRIVES

Rolling mill drives, cement mill drives, paper mill drives and textile mill drives.

UNIT - V INTRODUCTION TO AUTOMATION

Benefits and impact of automation on manufacturing and process industries, architecture of industrial automation systems,.

Process Control: P-I-D Control, Controller Tuning, Special Control Structures: Feedforward and Ratio Control, Predictive Control, Control of Systems with Inverse Response, Cascade Control, Advanced Control Schemes.

TEXT BOOKS:

1. Gobal K.Dubey, "Fundamentals of Electrical Drives", Narosal Publishing House, New Delhi, 2001
2. Bimal K.Bose "Modern Power Electronics and AC Drives", Pearson Education (Singapore) Pte. Ltd., New Delhi, 2003.
3. Industrial Automation and Process Control by Jon Stenerson, Ohio Prentice –Hall.

REFERENCE BOOKS:

1. Industrial Automation Hands on by Frank Lamb , Mc-Graw Hill Education.
2. Vedam Subramanyam, "Electric Drives – Concepts and Applications", Tata McGraw-Hill publishing company Ltd., New Delhi, 2002.
3. P.C Sen "Thyristor DC Drives", John wiely and sons, New York, 1981 5. Power Electronics By M. D. Singh

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	2	2	2	2	2	--	2	2	2	2	2
CO2	2	2	2	--	3	2	3	2	3	--	3	3	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE63 DESIGN OF ELECTRICAL APPARATUS

(Professional Elective – V)

Course Outcomes:

After completion of the course student will be able to

1. *design stator and rotor of induction machines and synchronous machines.*
2. *Apply computer aided design method.*
3. *Apply design considerations for rotating and static electrical machines*
4. *Model and analyze electrical apparatus and their application to Electrical Engineering.*

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UNIT I INTRODUCTION

Major considerations in Electrical Machine Design - Electrical Engineering Materials – Space factor – Choice of Specific Electrical and Magnetic loadings – Thermal considerations - Heat flow – Temperature rise - Rating of machines – Standard specifications.

UNIT II DC MACHINES

Construction - Output Equations – Main Dimensions – Choice of specific loadings – Selection of number of poles – Design of Armature – Design of commutator and brushes – design of field pole and coils – performance prediction using design values.

UNIT III TRANSFORMERS

Construction - Output Equations – Main Dimensions - KVA output for single and three phase transformers – Overall dimensions – design of yoke, core and winding for core and shell type transformers – equivalent circuit parameters from design data - Operating characteristics – efficiency - Regulation – No load current – Temperature rise in Transformers – Design of Tank and cooling tubes of Transformers.

UNIT IV INDUCTION MOTORS

Construction - Output equation of Induction motor – Main dimensions – choice of specific loadings – Design of Length of air gap – Design of squirrel cage rotor and wound rotor – equivalent circuit parameter from design data - Magnetic leakage calculations – Leakage reactance of polyphase machines- Magnetizing current - Short circuit current – Circle diagram - Operating characteristics.

UNIT V SYNCHRONOUS MACHINES

Output equations – choice of specific loadings – Design of salient pole machines – Short 86 circuit ratio – shape of pole face – Armature design – Armature parameters – Estimation of air

gap length – Design of rotor –Design of damper winding – Determination of full load field mmf – Design of field winding – Design of turbo alternators – Rotor design.

TEXT BOOKS:

1. Sawhney, A.K., 'A Course in Electrical Machine Design', Dhanpat Rai & Sons, New Delhi,Fifth Edition,1984.
2. Sen, S.K., 'Principles of Electrical Machine Designs with Computer Programmes', Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi, Second Edition, 2009.

REFERENCE BOOKS:

1. A.Shanmugasundaram, G.Gangadharan, R.Palani 'Electrical Machine Design Data Book',
2. New Age International Pvt. Ltd., Reprint 2007.
   Electrical Machine Design', Balbir Singh, Vikas Publishing House Private Limited, 1981.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	2	--	--	--	--	--	--	--	2	2	2
CO2	3	2	2	--	2	--	--	--	--	--	--	--	2	1	2
CO3	2	2	1	1	1	--	--	--	--	--	--	--	1	2	1
CO4	3	1	--	-	--	--	--	--	--	--	--	--	--	3	--

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE64 BIOMEDICAL INSTRUMENTATION

(Professional Elective – V)

Course Outcomes:

After completion of the course student will be able to

1. Analyse the Biomedical Instrumentation and diagnostic procedures
2. Design and operate medical equipment and its necessities

UNIT - I BASIC CONCEPTS OF MEDICAL INSTRUMENTATION

Terminology of medicine and medical devices-Generalized medical Instrumentation systems Medical measurement constraints-Classification of Biomedical instruments-Interfering and modifying inputs-Compensation Techniques-Bio-statics-Generalized static characteristics Generalized Dynamic Characteristics- Design criteria-Transducers Selection criteria. The origin of Biopotentials -Electrical activity of excitable cells-Volume conductor fields-Functional organization of peripheral Nervous system

UNIT - II ELECTRICAL PARAMETERS ACQUISITION AND ANALYSIS

Biopotential Electrodes-The electrode-Electrolyte interface-Polarization –Polarizable and non polarizable electrodes-Electrode behavior and circuit models-Electrode arrays-Microelectrodes. Electrical parameters acquisition - ECG – EEG – EMG – ERG – Lead systems and recording methods – Typical waveforms - Electrical safety in medical environment, shock hazards – leakage current-Instruments for checking safety parameters of biomedical equipments.

UNIT - III NON ELECTRICAL PARAMETERS MEASUREMENT AND DIAGNOSTIC PROCEDURES

Measurement of blood pressure - Cardiac output –blood flow- Heart rate - Heart sound - Pulmonary function measurements – spirometer – Photo Plethysmography, Body Plethysmography – Blood Gas analysers, pH of blood –measurement of blood pCO2, pO2, finger-tip oxymeter - ESR, GSR measurements .

UNIT - IV MEDICAL IMAGING SYSTEMS

X-ray machine- computer radiography - computer tomography- magnetic resonic imaging – Neuclear medicine – single photo emission computer tomography – positron emission tomography – Ultra sonography – Endoscopy – Thermography .

UNIT - V LIFE ASSISTING, THERAPEUTIC AND ROBOTIC DEVICES

Pacemakers – Defibrillators – Ventilators – Nerve and muscle stimulators – Diathermy – Heart – Lung machine – Audio meters – Dialysers – Lithotripsy - Therapeutic and Prosthetic Devices – Infant Incubators – Drug Delivery Devices – Surgical Instruments.

TEXT BOOKS:

1. John G. Webster, Medical Instrumentation Application and Design, John Wiley and sons, New York, 1998.
2. Leslie Cromwell, Biomedical Instrumentation and Measurement, Prentice hall of India, New Delhi, 2007.
3. Ed. Joseph D. Bronzino, The Biomedical Engineering HandBook, Second Edition, Boca Raton, CRC Press LLC, 2000.

REFERENCE BOOKS:

1. Joseph J.carr and John M. Brown, Introduction to Biomedical Equipment Technology, John Wiley and sons, New York, 1997.
2. Duane Knudson, Fundamentals of Biomechanics, Springer, 2003.
3. Suh, Sang, Gurupur, Varadraj P., Tanik, Murat M., Health Care Systems, Technology and Techniques, Springer, 1st Edition, 2011.
4. Khandpur R.S, Handbook of Biomedical Instrumentation, Tata McGraw-Hill, New Delhi, 1997.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	3	2	1	1	3	2	2	2	2	2	2	2	2	2
CO2	2	2	2	--	--	2	3	3	3	3	3	3	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – I Semester (EEE)

L	T	P	C
3	-	-	3

17AEE47 SMART ELECTRIC GRID

(Professional Elective – VI)

Course Outcomes:

After completion of the course student will be able to

1. Employ smart grid systems with connectivity of Non-conventional and conventional energy sources
2. Describe a power quality management and protection scheme for smart grid systems
3. Illustrate smart grid meters and its applications
4. Differentiate different scheme of technologies of smart grid
5. Analyze and compare the difference between the smart and micro grids

UNIT - I

INTRODUCTION TO SMART GRID: Evolution of Electric Grid, Concept, Definitions and Need for Smart Grid, Smart grid drivers, functions, opportunities, challenges and benefits, Difference between conventional & Smart Grid, Concept of Resilient & Self Healing Grid, Present development & International policies in Smart Grid, Diverse perspectives from experts and global Smart Grid initiatives.

UNIT - II

SMART GRID TECHNOLOGIES: Technology Drivers, Smart energy resources, Smart substations, Substation Automation, Feeder Automation , Transmission systems: EMS, FACTS and HVDC, Wide area monitoring, Protection and control, Distribution systems: DMS, Volt/VAr control, Fault Detection, Isolation and service restoration, Outage management, High-Efficiency Distribution Transformers, Phase Shifting Transformers, Plug in Hybrid Electric Vehicles (PHEV).

UNIT - III

SMART METERS AND ADVANCED METERING INFRASTRUCTURE: Introduction to Smart Meters, Advanced Metering infrastructure (AMI) drivers and benefits, AMI protocols, standards and initiatives, AMI needs in the smart grid, Phasor Measurement Unit(PMU), Intelligent Electronic Devices(IED) & their application for monitoring & protection.

UNIT - IV

POWER QUALITY MANAGEMENT IN SMART GRID: Power Quality & EMC in Smart Grid, Power Quality issues of Grid connected Renewable Energy Sources, Power Quality Conditioners for Smart Grid, Web based Power Quality monitoring, Power Quality Audit.

UNIT - V

HIGH PERFORMANCE COMPUTING FOR SMART GRID APPLICATIONS: Local Area Network (LAN), House Area Network (HAN), Wide Area Network (WAN), Broadband over Power line (BPL), IP based Protocols, Basics of Web Service and CLOUD Computing to make Smart Grids smarter, Cyber Security for Smart Grid.

TEXT BOOKS:

1. Janaka Ekanayake, Kithsiri Liyanage, Jianzhong Wu, Akihiko Yokoyama, Nick Jenkins, Smart Grid Technology and Applications, John Wiley & Sons Publication, 2012.
2. Smart Grid Primer, Published by Power Grid Corporation of India Limited, 2013.

REFERENCE BOOKS:

1. Fereidoon. P.Sioshansi, Smart grid – integrating renewable, distributed and efficient energy, Academic Press, 1st Edition, 2011.
2. Stuart Borlase, Smart Grids: Infrastructure, Technology and Solutions, CRC Press Publication, 1st Edition, 2012.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	1	-	-	1	-	1	-	-	-	3	2	1
CO2	3	3	2	1	-	-	1	-	1	-	-	-	3	2	2
CO3	3	3	3	2	-	-	1	-	2	-	-	-	3	2	1
CO4	2	3	3	1	-	-	1	-	1	-	-	-	3	3	1
CO5	3	3	3	1	-	-	2	-	1	-	-	-	3	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE66 MODELING OF POWER SYSTEM COMPONENTS

(Professional Elective – VI)

Course Outcomes:

After completion of the course student will be able to

1. Analyze and model System Load.
2. Analyze Stability Studies.

UNIT-I SYNCHRONOUS MACHINE ANALYSIS

Introduction, Representation of Synchronous Machine Dynamics, Stator and rotor winding voltage equations and flux linkages, Synchronous Machine Dynamics in Synchronous Reference Frame, Per Unit Representation-Stator and rotor winding voltage equations and flux linkage equations in per units.

UNIT-II MODELING OF SYNCHRONOUS MACHINE

Sub transient and transient reactance, open circuit sub-transient and transient time constants, Effect of saturation on Synchronous Machine Modeling, Estimation of Synchronous Machine Parameters through operational Impedance.

UNIT-III MODELING OF EXCITER AND TURBINE

Exciter, IEEE Type DCIA, Model of Turbine- Hydro Turbine, Steam Turbine, Turbine governor.

UNIT-IV MODELLING OF SYSTEM LOAD

Load Representation-State load representations, Model of Synchronous motor, Model of induction motor.

UNIT-V MODELLING CORELATED TO STABILITY STUDIES

Steady State Condition , Multi-Machine System Representation, Special case of impedance loads, Sub-transient Model with Stator and Network Transients Neglected.

TEXT BOOKS:

1. Prabha Kundar, "Power System Stability and Control", Tata Mc-Graw Hill Publications, 1994.
2. K.R.Padiyar, : Power System Dynamics Stability and Control", Second Edition, B.S. Publications, 2008.

REFERENCES:

1. P.M. Anderson, A.A.Fouad, "Power System Control and Stability", 2nd edition, IOWA State University Press, Galgotia Publications, 2002.
2. M.A.Pai,"Power System Stability-Anamysis by the direct method of Lyapunov", North Holland Publishing Company, Newyork,1981.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	--	--	--	--	2	--	--	2	2	2
CO2	3	2	2	2	2	--	--	--	--	2	--	--	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE67 OPERATION AND CONTROL OF POWER SYSTEMS

(Professional Elective – VI)

Course Outcomes:

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

1. Apply the concepts of economic dispatch and solve unit commitment problems with various constraints using conventional optimization techniques.
2. Solve AGC problems using heuristic techniques.
3. Apply skills in interchange of power & energy and power pools.
4. Analyze the formulation of AC & DC power flows and Orthogonal Decomposition estimation methods.

UNIT - I

ECONOMIC OPERATION & UNIT COMMITMENT: Introduction - Load forecasting - Economic dispatch problem – Gradient method - Newton's method – Unit Commitment – Optimal Unit Commitment - Constraints in unit commitment - Unit commitment Solution methods - Priority-List method - Dynamic Programming solution.

UNIT - II HYDROTHERMAL CO-ORDINATION: Short-term hydrothermal scheduling problem - Short-term hydro-scheduling using Gradient approach – Hydro units in series - pumped storage hydro plants - Dynamic programming solution to hydrothermal scheduling problem – Hydro scheduling using Linear programming.

UNIT – III AUTOMATIC GENERATION CONTROL (AGC): Review of Load Frequency Control and Economic Dispatch Control using the three modes of control viz. Flat frequency – Tie-line control and Tie-line bias control - AGC Features – Static and Dynamic response of Uncontrolled and Control two-area system.

UNIT – IV INTERCHANGE OF POWER & ENERGY: Economic interchange between interconnected utilities – Interutility energy evaluation – Interchange evaluation with Unit commitment - Power Pools – Transmission effects and Issues: Limitations – Wheeling.

UNIT – V POWER FLOW METHODS & ALGORITHMS: Formulation of AC Power Flow – Solution methods: Gauss Siedal, Newton Rapson and Decoupled Power flow methods – DC Power flow method - Maximum likelihood weighted least squares equation - Orthogonal Decomposition estimation method - Orthogonal Decomposition Algorithm.

TEXT BOOKS:

1. Allen J.Wood and Wollen berg B.F: Power Generation Operation and control, 2nd Edition, John Wiley & Sons.
2. Nagrath, I.J. and Kothari D.P: Modern Power System Analysis, 3rd Edition, Tata McGraw-Hill, New Delhi.
3. O.I. Elgerd: "Electric Energy System Theory - an Introduction", Tata McGraw Hill, New Delhi, 2002.

REFERENCES:

1. Kothari D.P. & J.S. Dhillon: Power System Optimization, Printice Hall of India, 2004
2. Chakrabarthi A., S.Halder: Power System Analysis: Operation & Control, PHI, 2006.
3. R.N.Dhar: Computer Aided Power Systems Operation and Analysis, Tata McGraw Hill, 1982.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	2	1	1	2	--	--	--	--	--	--	3	1	2
CO2	3	2	2	1	1	2	--	--	--	--	--	--	3	1	2
CO3	3	2	2	1	1	2	--	--	--	--	--	--	3	1	2
CO4	3	2	2	1	1	2	--	--	--	--	--	--	3	1	2

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE68 OPTIMAL CONTROL SYSTEMS

(Professional Elective – VI)

Course Outcomes:

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

1. Select the performance measure and for typical different control problem apply principle of controllability and observability in solving linear system.
2. Apply Euler's equation for solving optimal control problems having functional of single function and functional involving several independent functions.
3. Solve several optimal control problems using Hamaltonian function and Pontryagin's minimum principle.
4. Apply Dynamic programming to solve nonlinear problems.

UNIT I

INTRODUCTION: The Mathematical Model of a Process, Physical Constraints. The Performance Measure , the Optimal Control Problem , Forms of the Optimal Control, State Variable Representation of System – System Classification and Output Equations , Solution of State Equation – Linear Systems, Typical Control Problems, Selection of Performance Measure , Controllability and Observability.

UNIT II

THE CALCULUS OF VARIATIONS – I: Fundamental Concepts, Maxima and Minima of Functions, Fundamental Theorem of Calculus of Variations. Functional of Single Function, The Simplest Variation Problem- Euler's Equation, Fixed End Point Problem- Free End Point Problem.

UNIT III

THE CALCULUS OF VARIATIONS – II: Functional Involving Several Independent Functions – Problem with Fixed End Points – Problems with Free End Points, Constrained Extrema- Constrained Minimization of Function and Functional.

UNIT IV

VARIATIONAL APPROACH TO OPTIMAL CONTROL PROBLEMS: Necessary Conditions for Optimal Control Hamaltonian Function- Boundary Conditions in Optimal Control Problems – Linear Regulator Problems – Matrix Ricalti Equation – Linear Tracking Problem.

PONTRYAGIN'S MINIMUM PRINCIPLE: State un Equality Constraints – Minimum Time Problem- Minimum Control Effort Problem- Minimum Fuel Problem – Minimum Energy Problem.

UNIT V

DYNAMIC PROGRAMMING: The Optimal Control Law, The principal of Optimality, Dynamic Programming applied to Routing Problems, An Optimal Control Systems-A recurrence Relation of Dynamic Programming – Computational Procedure for Solving Optimal Control Problems – Discrete Linear Regulator Problems, Hamilton – Jacobian- Bellman Equation-Continuous Linear Regulator Problems.

NUMERICAL DETERMINATION OF OPTIMAL TRAJECTORIES: Two-Point Boundary-Value Problem- Method of Steepest Descent –Steepest Descent Algorithm.

TEXT BOOKS:

1. Donald E. Krik: Optimal Control Theory, Library of Congress Cataloging in Publication Data.
2. M.Gopal: Modern Control Systems Theory, New age International Publishers, 5th Edition, 1984

REFERENCES:

1. A.P.Sage: Optimal System Control, Pearson Education Canada, 1977.
2. Ogata: Modern Control Systems Theory, Prentice Hall, 2010.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	3	3	2	--	--	--	--	2	--	--	2	2	2
CO2	3	2	2	2	2	--	--	--	--	2	--	--	3	1	3
CO3	2	2	2	2	1	--	--	--	--	1	--	--	2	2	2
CO4	3	1	1	1	--	--	--	--	--	--	--	--	3	3	3
CO5	3	3	3	3	2	-	-	-	-	2	-	-	3	1	3

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
3	-	-	3

17AEE69 DIGITAL CONTROL SYSTEMS

(Professional Elective – VI)

Course Outcomes:

After completion of the course student will be able to

1. Apply Advanced Control Theory To Practical Engineering Problems
2. Design Tuning Of PID Controllers In Discrete Domain
3. Conduct State Variable Analysis In Discrete Domain

UNIT I : INTRODUCTION

Introduction To Digital Control – Sampling Process – Sample And Hold Circuit – Zero And First Order Hold – Z-Transform – Inverse Z- Transform – Region Of Convergence – Initial And Final Value Theorem

UNIT II : PULSE TRANSFER FUNCTION AND TIME RESPONSE

Block Diagram Reduction Methods – Reduction Rules- Multi-Loop – MIMO Systems – Signal Flow Graph- Steady State Error – Error Transfer Functions- Error Constants-Time-Domain Analysis Of Second Order Systems-Time Response

UNIT III : STABILITY

Introduction-Jury Stability Test- Schur-Cohn Stability Test- Bilinear Transformation-Stability By Pole Location – Root Locus Method- Bode Plot- Nyquist Plot.

UNIT IV : DIGITAL PID CONTROLLER

Cascade Compensation- Digital Lag Lead Compensator By Bode Method- Design Of P,PI And PID Controller- Ziegler's- Nichols Method, Cohen-Coon Method

UNIT V : STATE SPACE ANALYSIS

Realisation Of Pulse Transfer Function- Diagonalisation- Discretisation Of Continuous Time

Systems State Transition Matrix- Solution Of Discrete-Time State Equations- Controllability And Observability

TEXT BOOKS:

1. V.I.George And C.P.Kurien, Digital Control System, Cengage Learning, 2012.
2. B.C.Kuo, Digital Control System, 2nd Edition, Oxford University Press, 2010.
3. M.Sami Fadali, Antonio Visioli, Digital Control Engineering Analysis And Design, Academic Press, 2013.

REFERENCE BOOKS:

1. M.Gopal, 'Digital Control And State Variable Methods', Tata McGraw Hill, 3rd Edition, 2009.
2. C.M. Houpis, G.B.Lamount, ' Digital Control Systems- Theory, Hardware, Software', International Student Edition, McGraw Hill Book Co., 1985.
3. Kannan M.Moddgalya, Digital Control, Wiley India, 2007.
4. C.L.Philips And J.M.Pan, "Feedback Control System, Pearson, 2013.

Mapping of CO's- PO's-PSO's

Course Outcome	Program Outcomes												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	2	1	3	--	--	--	--	--	--	--	2	2	1
CO2	3	2	3	2	2	--	0.1	--	--	1	--	--	3	1	3
CO3	2	2	1	1	2	0.1	--	--	--	2	--	--	2	2	1

SRI VENKATESWARA COLLEGE OF ENGINEERING AND TECHNOLOGY
(AUTONOMOUS)

IV B.Tech – II Semester (EEE)

L	T	P	C
-	-	-	2

17AEE70 COMPREHENSIVE VIVA – VOCE

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IV B.Tech – II Semester (EEE)

17AEE71 PROJECT WORK

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-	-	20	12