R09

ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRICAL AND ELECTRONICS ENGINEERING

For

B.TECH. FOUR YEAR DEGREE COURSE
(Applicable for the batches admitted from 2014-2015)

VAAGDEVI COLLEGE OF ENGINEERING
(Autonomous)
Bollikunta, Warangal – 506 005
Telangana State, India

VAAGDEVI COLLEGE OF ENGINEERING

(AUTONOMOUS)

Bollikunta, Warangal – 506 005. T.S.

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Academic Regulations for B.Tech. (Regular)

(Effective for the students admitted into I-Year from the Academic year 2014-2015)

1. Award of B.Tech. Degree

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

i. Pursued a course of study for not less than four academic years and not more than eight academic years.
ii. Register for all credits and secure all credits with the exemption of 8 credits in elective subjects.

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech. course unless extension is granted by Academic Council to complete the course for a further period.

3. Courses of Study

The following courses of study are offered at present for specialization for the B.Tech. Course:

Branch Code	Branch
01	Civil Engineering
02	Electrical & Electronics Engineering
03	Mechanical Engineering
04	Electronics & Communication Engineering
05	Computer Science & Engineering

And any other course as approved by the authorities of the college from time to time.

4. Credits

	For I-Year-I/II Semester		II,III,IV Years per Semester	
	Periods/Week	Credits	Periods/Week	Credits
Theory	04	04	03	04
	02	02	04	04
Practical	03	02	03	02
Drawing	03T/03D	04	03	02
Mini Project	-	-	-	02
Comprehensive Viva Voce	-	-	-	02
Seminar	-	-	02	02

Project	-	-	15	12

5. Distribution and Weightage of Marks /Credits:

i. The Performance of a student in each semester shall be evaluated subject-wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, Industry oriented mini-project, seminar, comprehensive viva-voce and project work shall be evaluated for 50, 50, 100 and 200 marks respectively.

ii. For theory subjects the distribution shall be 25 marks for Internal Evaluation and 75 marks for the End-Examination.

iii. For theory subjects, during the semester there shall be 2 mid term examinations. Each mid term examination consists of Part-A (Objective Type) for 5 marks and Part-B (subjective paper) for 15 marks with duration of 90 minutes and two assignments carrying 5 marks.

Subjective paper shall contain 5 questions of which student have to answer 3 questions of each 5 marks. First mid term examination shall be conducted for 2.5 units of syllabus and second mid term examination shall be conducted for 2.5 units. First Assignment should be submitted before the conduct of the first mid term examination, and the second Assignment should be submitted before the conduct of the second mid term examination.

The total marks secured by the student in each mid term examination for 25 marks are considered and the average of the two mid term examinations shall be taken as the final marks secured by each candidate. If he is absent for any test/assignment, he is awarded zero marks for that test/assignment. However a candidate may permitted on medical grounds/extreme conditions provided he applied for makeup examinations within a week. A subcommittee will be constituted by the Academic Council to look in to such cases.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 end examination marks. Out of the 25 sessional marks, day-today work in the laboratory shall be evaluated for 15 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted with one external examiner and one internal examiner. The external examiner shall be appointed from the panel of examiners as recommended by the Chairman, Board of Studies in respective Branches.

v. For the subject having design and/or drawing, (such as Engineering Graphics Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a semester and the average of the two shall be considered for the award of marks for internal test.

vi. There shall be an industry-oriented mini project, in collaboration with an industry of their specialization, to be taken up during the vacation after III-year II-Semester examination. However, the mini project and its report shall be evaluated in IV Year I-Semester. The industry oriented mini project shall

be submitted in a report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.

vii. There shall be a seminar presentation in IV Year II-Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the departmental committee consisting of Head of the Department, seminar supervisor and a senior faculty member. The seminar report and presentation shall be evaluated for 50 marks. There shall be no external examination for seminar.

viii. There shall be comprehensive Viva-Voce in IV-Year II-Semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty Members of the Department. The Comprehensive Viva-Voce is aimed to assess the student's understanding in various subjects he/she studied during the B.Tech. course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive Viva-Voce.

ix. Out of a total of 200 marks for the project work, 50 marks shall be for internal evaluation and 150 marks for the end semester examination. The end semester examination (Viva-Voce) shall be conducted by a committee. The committee consists of an external examiner, head of the department, and the supervisor of the project and a senior faculty member of the department. The topics for industry oriented mini project, seminar and project work shall be different from each other. The internal evaluation shall be on the basis of two seminars given by each student on the topic of his project.

6. Attendance Requirements:

i. A student shall be eligible to appear for the end examinations if he acquires a minimum of 75% of attendance in all the subjects (in each subject).
ii. Condonation of shortage of attendance in each subject up to 10% (On genuine medical grounds) in each semester may be granted by the College Academic Council on the basis of recommendation by the Principal.
iii. Shortage of attendance below 65% in each subject shall in no case be condoned.
iv. Student falling short of attendance as specified above will be detained.
v. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester. They may seek-re-admission for that semester when offered next.
vi. Students whose shortage of attendance is not condoned in any semester are not eligible to take their end examination of that class and their registration shall stand cancelled.
vii. A stipulated fee decided by the Academic Council shall be payable towards condonation of shortage of attendance.

7. Minimum Academic Requirements:

The following academic requirements have to be fulfilled in addition to the attendance requirements mentioned in item no.6.

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

ii. A student shall be promoted from II to III year only if he fulfills the academic requirement of 32 credits (out of 80 credits) secured from all the examinations (both regular and supplementary) conducted up to end of II-Year, excluding the performance in II-B.Tech-II-Semester examination.

iii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of 54 credits (out of 134 credits) secured from all the examinations (both regular and supplementary) conducted up to end of III-Year, excluding the performance in III-B.Tech.-II-Semester examination.

iv. A student should earn all credits with an exemption of 8 credits in elective subjects. The marks obtained in the subjects excluding the subjects exempted shall be considered for the calculation of percentage of marks.

v. Student who fails to earn credits with an exemption of eight credits as indicated in the course structure within eight academic years from the year of admission shall forfeit his seat in B.Tech. course unless an extension is given by College Academic Council to complete the course for a further period.

8. Course Pattern:

i. The entire course of study is of four academic years. All years shall be on semester pattern.

ii. A student is eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

iii. When a student is detained due to lack of credits/shortage of attendance he may be re-admitted when the semester is offered after fulfillment of academic regulations.

9. Award of Class:

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

Class Awarded	percentage of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured in the subjects excluding the subjects exempted.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The Marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

10. Minimum Instruction Days:

For each semester there shall be a minimum of 90 clear instruction days.

11. There shall be no branch transfers after the completion of admission process.

12. General:

i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.

ii. The academic regulations should be read as a whole for the purpose of any interpretation.

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

iv. The College may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the college.

Academic Regulations for B.Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II-Year from the academic year 2015-2016 and on wards)

1. The students have to acquire all credits from II to IV year of B.Tech. Program (Regular) for the award of the degree. Register all credits and secure all credits with the exemption of 8 credits in elective subjects.

2. Student, who fails to fulfill the requirements for the award of the degree in six consecutive academic years from the year of admission, shall forfeit his seat unless extension is granted by Academic Council to complete the course for a further period.

3. The same attendance regulations are to be adopted as that of B.Tech. (Regular).

4. **Promotion Rule:**

   A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of 32 credits from the following examinations.

   a. Two regular and one supplementary examinations of II-Year I-Semester.
   b. One regular one supplementary examinations of II-Year II-Semester.
   c. One regular examination of III-Year I-Semester.

5. **Award of Class:**

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

First Class with Distinction	70% and above	From the aggregate marks secured in subjects.(i.e., II-Year to IV-Year) excluding the subjects exempted.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

   (The Marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

6. All other regulations as applicable for B.Tech. IV-Year degree course (Regular) will hold good for B.Tech. (Lateral Entry Scheme)

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MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

	Nature of Malpractices/Improper Conduct	Punishment
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with or related to the subject of the examination (theory or practical) in which he is appearing but has not made use of (material shall include any marks on the body of the candidate which can be used as an aid in the subject of the examination)	Expulsion from the examination hall and cancellation of the performance in that subject only.
(b)	Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester. The Hall Ticket of the candidate is to be cancelled.
3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practicals and project work) already appeared and shall not be allowed to appear for examinations of

		the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Chief Superintendent/Assistant – Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-incharge, or any person on duty in or outside the examination hall or any of his relations, or indulges in	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

	any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police

		and, a police case will be registered against them.
10.	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the University for further action to award suitable punishment.	

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ELECTRICAL AND ELECTRONICS ENGINEERING
(Applicable for the batches admitted from A.Y. 2014-15 onwards)

COURSE STRUCTURE

I YEAR **I SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A91001	Mathematics- I	4	1	0	4
2	A91002	English	4	0	0	4
3	A91003	Applied Physics	4	1	0	4
4	A91004	Engineering Chemistry	4	1	0	4
5	A91301	Engineering Graphics	2	0	4	4
6	A91005	English Language Communication Skills Lab	0	0	3	2
7	A91006	Applied Physics Lab	0	0	3	2
8	A91303	Engineering Workshop	0	0	3	2
		Total	**18**	**3**	**13**	**26**

I YEAR **II SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A92001	Mathematics – II	4	1	0	4
2	A92004	Environmental Studies	4	0	0	4
3	A92005	Computational Mathematics	2	0	0	2
4	A92006	Human values and Professional Ethics	2	0	0	2
5	A92201	Electrical Circuits-I	4	1	0	4
6	A92402	Electronic Devices and Circuits	4	1	0	4
7	A92503	Problem Solving & Computer Programming	4	0	0	4
8	A92009	Computational Mathematics Lab	0	0	3	2
9	A92504	Problem Solving & Computer Programming Lab.	0	0	3	2
		Total	**24**	**3**	**6**	**28**

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COURSE STRUCTURE

II YEAR **I SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A93001	Mathematics-III	4	1	0	4
2	A93201	Electromagnetic Fields	4	1	0	4
3	A93202	Electrical Circuits-II	4	1	0	4
4	A93203	Electrical Machines-I	4	1	0	4
5	A93505	Data Structures through C++	4	1	0	4
6	A93204	Electrical Circuits Lab	0	0	3	2
7	A93407	Electronic Devices and Circuits Lab	0	0	3	2
8	A93508	Data Structures through C++ Lab	0	0	3	2
		Total	**20**	**5**	**9**	**26**

II YEAR **II SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A94201	Power Systems-I	4	1	0	4
2	A94202	Electrical Machines –II	4	1	0	4
3	A94203	Electrical Measurements	4	1	0	4
4	A94305	Thermal and Hydro Prime Movers	4	1	0	4
5	A94401	Switching Theory and Logic Design	4	0	0	4
6	A94402	Pulse & Digital Circuits	4	0	0	4
7	A94206	Electrical Machines Lab-I	0	0	3	2
8	A94207	Basic Simulations Lab	0	0	3	2
9	A94006	Gender Sensitization	2	0	0	0
		Total	**24**	**4**	**6**	**28**

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III YEAR **I SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A95201	Power Systems-II	4	1	0	4
2	A95202	Control Systems	4	1	0	4
3	A95203	Power Electronics	4	1	0	4
4	A95407	Linear and Digital IC Applications	4	0	0	4
5	A95204	Electrical Machines –III	4	0	0	4
6	A95208	Electrical Measurements Lab	0	0	3	2
7	A95209	Electrical Machines -II lab	0	0	3	2
8	A95002	Advanced English Language and Communication Skills Lab	0	0	3	2
		Total	**20**	**3**	**9**	**26**

III YEAR **II SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A96201	Switch Gear and Protection	4	1	0	4
2	A96202	Power Semiconductor Drives	4	1	0	4
3	A96621	Managerial Economics & Financial Analysis	4	0	0	4
4		**Open Elective**	4	0	0	4
	A96105	Disaster Management				
	A96106	Air Pollution & Control				
	A96203	Renewable Energy Sources				
	A96204	Energy Storage Systems				
	A96307	Nanotechnology				
	A96413	Embedded Systems & Microprocessors				
	A96414	Principles of Communication Systems				
	A96512	Database Management Systems				
	A96513	Java Programming				
5		**Departmental Elective-I**	4	0	0	4
	A96205	Utilization of Electrical Energy				
	A96206	Linear System Analysis				
	A96514	Computer Organization				
	A96402	Digital Signal Processing				
6	A96415	IC and PDC Lab	0	0	3	2
7	A96210	Control Systems and Simulation Lab	0	0	3	2
8	A96211	Power Electronics and Drives Lab	0	0	3	2
9	A96002	Personality Development and Soft Skills	2	0	0	2
		Total	**22**	**2**	**9**	**28**

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VI YEAR **I-SEMESTER**

S.No.	Code	Subject	L	T	P	Credits
1	A97411	Microprocessors and Microcontrollers Architecture and Programming	4	1	0	4
2	A97201	Power System Operation and Control	4	1	0	4
3	A97202	Power System Analysis	4	1	0	4
4	A97203 A97204 A97205	**Department Elective-II** 1. Electrical Distribution Systems 2. High Voltage Engineering 3. Modern Power Electronic Converters	4	1	0	4
5	A97206 A97207 A97208	**Department Elective-III** 1. Digital Control Systems 2. HVDC Transmission 3. Power Quality	4	0	0	4
6	A97212	Power Systems Lab	0	0	3	2
7	A97412	Microprocessors and Micro Controllers Lab	0	0	3	2
8	A97209	Seminar	0	0	3	2
9	A97210	Industry Oriented Mini Project (Summer Program)	0	0	0	2
		Total	**20**	**4**	**09**	**28**

II SEMESTER

S.No.	Code	Subject	L	T	P	Credits
1	A98624	Management Science	4	0	0	4
2	A98201 A98202 A98203 A98204	**Department Elective-IV** 1. Power System Deregulation 2. Energy Auditing, Conservation and Management 3. Switch Mode power Supplies 4. Artificial Neural Networks and Fuzzy Systems	4	0	0	4
3	A98205	Comprehensive viva	0	0	0	2
4	A98206	Major Project	0	0	0	12
		Total Credits	**08**	**0**	**0**	**22**

VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91001) MATHEMATICS – I
(Common for all Branches)

I Year I-Sem

L	T	P	C
4	1	0	4

Course Objective:

The main aim of teaching Engineering Mathematics-I is to emphasize the relevance of fundamentals and applications of Mathematics in Engineering field. Mathematics is the basic of all branches of modern business and science and technology. It deals with using the constructive results of mathematics to solve a problem in applied science or Engineering field.

It helps the students in choosing a technique that improve the quality and efficiency of actual computation.

Unit-I:

Differential calculus:
Rolle's Mean Value theorem, Lagrange's Mean Value Theorem, Cauchy's Mean Value Theorem, Taylor's Theorem with geometrical and algebraic interpretation (without proof). Functions of several variables-Chain Rule. Jacobian, Functional dependence, maxima and minima of functions of two variables, with constraints and without constraints-Method of Lagrange's multipliers.

Unit-II:
Ordinary differential equations of first order:

Formation of differential equations**,** solution of differential equations of First order and First degree. Exact differential equations , Linear Differential equations. Bernouli's Differential equations, Orthogonal Trajectories ,Newton's law of cooling and Natural law of growth and Decay.

Unit-III:

Ordinary linear differential equations of higher order:
Homogenous linear differential equations of higher order with constant coefficients, Non Homogenous linear differential equations of higher order of the form e^{ax}, Sinax, Cosax, Polynomials in x, e^{ax} v(x), x^k v(x), Cauchy-Euler equation and Lagrange's equation, Method of variation of parameters.

Unit-IV:

Improper integration and multiple integrals:
Beta and Gamma functions, properties and Relation between them Evaluation of improper integration using Beta, Gamma functions. Multiple integrals- double & triple integrals. Change of variables and change of order of integration. Finding area and volume of region.

Unit-V:

Laplace Transformation:

Laplace transform - Inverse Laplace transform - properties of Laplace transforms - Laplace transforms of unit step function, impulse function and periodic function - convolution theorem - Solution of ordinary differential equations with constant coefficients and system of linear differential equations with constant coefficients using Laplace transform.

Recommended Text Books:

1. R. K. Jain and S. R. K. Iyengar: Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal: Higher Engineering Mathematics, Khanna Publications, 2009.

Reference Book:

1. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
2. T. K. V. Iyengar: Engineering Mathematics-I, S. Chand and Company.
3. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama Chary.
4. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link.

Learning Outcomes:

By studying Mathematics-I students understanding the method of solving first order & higher order differential equations and they convert the trigonometric functions into algebraic function by studying mean value theorems. They understand how to find area, volume by using applications of integration. They understand how to find the solution of initial value problem without finding general solution by Laplace Technique.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91002) ENGLISH
(Common for all Branches)

I Year I-Sem	**L**	**T**	**P**	**C**
	4	**0**	**0**	**4**

1. INTRODUCTION:

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competencies of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks.

In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc.

The text for non-detailed study is for extensive reading/reading for pleasure. Hence, it is suggested that they read it on their own the topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc.. *However, the stress in this syllabus is on skill development, fostering ideas and practice of language skills.*

2. OBJECTIVES:

- To improve the language proficiency of the students in English with emphasis on LSRW skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- To develop the study skills and communication skills in formal and informal situations.

Learning Outcomes

- Usage of correct English Language, written and spoken
- Enrichment of comprehension and fluency
- Gaining confidence in using language in varied situations

SYLLABUS:

Listening Skills:

Objectives

- To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play – Individual/Group activities (Using exercises from all the **six** units of the prescribed text: ***Skills Annexe: Functional English for Success*.)**
- Just A Minute(JAM) Sessions.

Reading Skills:

Objectives

To develop an awareness in the students about the significance of silent reading and comprehension.

1. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Scanning
- Recognizing coherence/sequencing of sentences

NOTE : *The students will be trained in reading skills using the prescribed text for detailed study. They will be examined in reading and answering questions using 'unseen' passages which may be taken from authentic texts, such as magazines/newspaper articles.*

Writing Skills:

Objectives:

- To develop an awareness in the students about writing as an exact and formal skill
- To equip them with the components of different forms of writing, beginning with the lower order ones.

Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Describing graphs using expressions of comparison

4. *TEXTBOOKS PRESCRIBED:*
For Detailed study
- First Textbook entitled **"*Skills Annexe -Functional English for Success*",** Published by Orient Black Swan, Hyderabad
- The Second Textbook entitled **"*Epitome of Wisdom*",** published by Maruthi Publications, Hyderabad.

The course content and study material is divided into **Five Units.**

Unit – I:

Importance of communication in English-Globalisation-changing trends-barriers to communication

Unit –II:

- Chapter entitled '***Wit and Humour***' from 'Skills Annexe' -Functional English to Success Published by Orient Black Swan, Hyderabad
- Chapter entitled **'*Mokshagundam Visvesvaraya*'** from *"Epitome of Wisdom",* Published by Maruthi Publications, Hyderabad.

and

S-Greeting and Taking Leave, Introducing Oneself and Others (Formal and Informal Situations)
R- Reading for Subject/ Theme
W- Writing Paragraphs
G-Types of Nouns and Pronouns
V- Homonyms, homophones synonyms, antonyms

Unit –III
- Chapter entitled "***Advances in Science and Technology"*** from "***Skills Annexe - Functional English for Success***" Published by Orient Black Swan, Hyderabad.
- Chapter entitled **'*Three days To See*'** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L – Listening for themes and facts
S – Apologizing, interrupting, requesting and making polite conversation
R- for theme and gist
W- Describing people, places, objects, events
G- Verb forms
V- Noun, verb, adjective and adverb

Unit –IV

- Chapter entitled **'*Risk Management*'** from **"*Skills Annexe -Functional English for Success*"** Published by Orient Black Swan, Hyderabad.
- Chapter entitled **'*Leela's Friend*'** by R.K. Narayan from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L – for main points and sub-points for note taking
S – Giving instructions and directions; Speaking of hypothetical situations
R – Reading for details
W – Note-making, information transfer, punctuation
G – Present tense
V – Synonyms and Antonyms

Unit –V

- Chapter entitled '***Human Values and Professional Ethics'*** from "***Skills Annexe - Functional English for Success"*** Published by Orient Black Swan, Hyderabad.

- Chapter entitled ***'The Last Leaf'*** from ***"Epitome of Wisdom",*** Published by Maruthi Publications, Hyderabad.

and

L -Listening for specific details and information
S- Narrating, expressing opinions and telephone interactions
R -Reading for specific details and information
W- Writing formal letters and CVs
G- Past and future tenses
V- Vocabulary - idioms and Phrasal verbs
* Exercises from the texts not prescribed shall also be used for classroom tasks.

SUGGESTED READING:

1. ***Contemporary English Grammar Structures and Composition*** by David Green, MacMillan Publishers, New Delhi. 2010.
2. **Innovate with English: A Course in English for Engineering Students,** edited by T Samson, Foundation Books.
3. English for Employability-**K. Purushotham, Orient Blackswan** (with CD).
4. Listening & Speaking Skills **Book I and Book II, Cambridge Publishers** (with CD's).
5. English Grammar Practice**, Raj N Bakshi, Orient Longman.**

6. **Technical Communication** by Daniel Riordan. 2011. **Cengage Publications. New Delhi.**
7. **Effective English, edited** by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by **Pearson**
8. Handbook of English Grammar and Usage**, Mark Lester and Larry Beason, Tata Mc Graw –Hill.**
9. Spoken English**, R.K. Bansal & JB Harrison, Orient Longman.**
10. Technical Communication, **Meenakshi Raman, Oxford University Press**
11. Objective English **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
12. Grammar Games**, Renuvolcuri Mario, Cambridge University Press.**
13. Everyday Dialogues in English**, Robert J. Dixson, Prentice Hall India Pvt Ltd.,**
14. ABC of Common Errors **Nigel D Turton, Mac Millan Publishers.**
15. Basic Vocabulary **Edgar Thorpe & Showick Thorpe**, **Pearson Education**
16. Effective Technical Communication**, M Ashraf Rizvi, Tata Mc Graw –Hill.**
17. An Interactive Grammar of Modern English, **Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO**
18. A Communicative Grammar of English, **Geoffrey Leech, Jan Svartvik, Pearson Education**
19. Enrich your English, **Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,**
20. A Grammar Book for You And I, **C. Edward Good, MacMillan Publishers.**
21. Practical English Usage **(ELBS) Michael Swan.**
22. Examine Your English – **Margaret Maison.**
23. The Parts of Speech: **P. Satyanarayana, P.C. Ray Publications,** Warangal, 2003.
24. The Tense: **P. Satyanarayana, P.C. Ray Publications,** Warangal 2003.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91003) APPLIED PHYSICS

I Year I-SEM: ECE, CSE & EEE

L	T	P	C
4	1	0	4

Objectives:

- Physics is the mother of engineering and technology. Without the applications of concepts of physics there can be no technological developments. Hence physics is the foundation on which stands the elaborate structure of technology. The main purpose of teaching physics to engineering under graduates is to acquaint the budding engineers with a thread of development. The aim of Physics is to provide an adequate exposure and develop insight about the basic principles of physics along with the engineering applications. The acquaintance of basic physics principles would help the engineers to understand the tools and techniques used in the industry and provide the necessary foundations for inculcating innovative approaches.

Unit-I:
Elements of Statistical Mechanics & Quantum Mechanics
Elements of Statistical Mechanics: Phase space, Ensembles, Micro canonical, canonical and grand canonical ensembles, Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (qualitative treatment), Concept of electron gas, Density of states, Fermi energy, Fermi level.
Quantum Mechanics: Waves and Particles, de Broglie hypothesis, Matter waves, Davisson and Germer's experiment, Heisenberg's uncertainty principle & its applications, Schrodinger time independent wave equation, Physical significance of the wave function, Particle in one dimensional potential box.

Unit-II:
Electron theory of metals & Band theory of solids.
Electron theory of metals: The classical free electron theory of metals, Electrical conductivity, Mean free path, Relaxation time and Drift velocity, Successes and drawbacks of free electron theory.
Band theory of solids: Electrons in a periodic potential, Bloch theorem, Kronig-Penny model (Qualitative treatment), E-k, curve, Concept of effective mass of electron. Origin of band formation in solids, Classification of materials into conductors, semi conductors and insulators.

Unit-III:
SEMI-CONDUCTOR PHYSICS & SEMI-CONDUCTOR DEVICES.
Semi-conductor Physics: Introduction, Calculation of carrier concentration in intrinsic semiconductors and extrinsic semi conductors (N type), Direct and Indirect band gap semi conductors, Hall effect and its applications.
Semi-conductor devices: Energy diagram of P-N diode, Diode equation, I-V characteristics of P-N junction diode, LED, LCD, Photo diode & Solar cell.

Unit-IV:

DIELECTRICS & MAGNETIC MATERIALS

Dielectrics: Introduction, Electric dipoles, Dipole moment, Dielectric constant, Polarizability, Electric susceptibility, Displacement vector, Electronic, Ionic and Orientational polarizations and calculations of electronic and ionic polarizabilities , Internal fields in solids, Clausius - Mosotti equation, Piezo-electricity, Ferro electricity, Pyro electricity.

Magnetic Materials: Origin of magnetic moment, Bohr magneton, Classification of dia, para and ferro magnetic materials on the basis of magnetic moment, Domain theory of ferro magnetism on the basis of hysteresis curve, Soft and hard magnetic materials , Properties of anti-ferro and ferri magnetic materials & their applications.

Unit-V:

LASERS & FIBRE OPTICS

Lasers: Characteristics of lasers, Spontaneous and stimulated emission of radiation, Einstein's coefficients and relation between them, Population inversion, Lasing action, He-Ne laser. Semi conductor diode laser (Homo-junction), Applications of lasers in engineering and medicine.

Fibre Optics: Introduction, Acceptance angle and acceptance cone, Numerical aperture, Step index and graded index fibres, Attenuation in optical fibres, Applications of optical fibres in communication systems.

Recommended Textbooks:

1. Applied Physics for Engineers – P. Madhusudana Rao, Academic Publishing Company, 2013.
2. Engineering Physics, P.K Palanisamy, Scitech Publications.
3. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar, S. Chand & Co. (for acoustics).

Reference Books:

1. Engineering Physics, V. Rajandran, Tat Mc. Graw Hill Book Publishers.
2. Solid State Physics – M.Armugam, Anuradha Publications.
3. Introduction to Solid State Physics, C. Kittel (Wiley Eastern).
4. Solid State Physics, A.J. Dekker (Macmillan).
5. Applied Physics, Mani Naidu Pearson Edition.
6. Engineering Physics by Dr. K. Bhattacharya, A. Bhaskaran, Oxford Press.

Learning Outcomes:

1. The students will know the difference between classical and quantum mechanics. And also they will learn how this quantum mechanics is useful for the fields like medicine and industry.
2. The students will know how an electron moves in a potential well. They also learn how the solids are classified on basis of band theory.
3. The students will learn about the different semi-conducting devices along with the necessary basic theory.
4. The students will learn about various magnetic materials and dielectric materials which find many industrial applications.
5. The students learn about different types of emission of radiation and advanced applications of leaser in different fields.
6. They learn about different types of optical fibres and their applications in different fields.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING CHEMISTRY

	L	T	P	C
I Year I-SEM CIVIL, MECH. & EEE (A91004)				
II-SEM ECE & CSE (A92003)	**4**	**1**	**0**	**4**

Objectives:

The purpose of these courses is to emphasize the relevance of fundamentals and applications of chemical sciences in the field of engineering. Thus, the courses have been conceived in such a way that they take into account appropriate combinations of old and new emerging concepts in the chemical sciences area and their current and potential uses in engineering. The Courses attempt to address the principles of general chemistry and specific topics relevant to various engineering disciplines, wherein the students can apply this learning in their respective areas of expertise.

The syllabus has sought to fulfill the objective of making the student of engineering and technology realize that chemistry like other subjects is the real base of their profession and that therefore they must have a good understanding of chemistry before they can use it in their profession.

Unit – 1:

Electro Chemistry

Conductors, Non-conductors, Faraday's laws, Ohm's law, conductance, specific, equivalent and molar conductance, units and their relation. Numerical Problems. Applications of conductance – conductometric titrations.
EMF: Electrochemical and Electrolytic cells, Galvanic cell, Electro chemical series, measurement of emf and single electrode potential, Nernst's equation and its applications,

Unit – 2:

Electrodes and Battery Chemistry

Introduction, Types of electrodes: Reference electrodes (SHE, SCE and QH), Ion-selective electrode-Glass electrode, applications of electrode potentials- Determination of PH and Potentiometric Titrations. Numerical Problems. Concentration cells-Electrode concentration cells and Electrolyte concentration cells. Batteries: Primary cells-Dry cell, Secondary cells - Pb-Acid storage cell, Fuel cells- Hydrogen-Oxygen fuel cell.
Solar Batteries, Relation between electrical and heat energy.

Unit –3:

Corrosion and Its control

Introduction, Causes of corrosion, Types of corrosion- Dry and Wet corrosion. Factors affecting on corrosion, Corrosion controlling methods- Cathodic protection and Surface coatings (anodic and Cathodic), Methods of applications of metal coatings- Hot dipping and electroplating.

Unit – 4:

Polymer Chemistry

Introduction, Functionality of Monomers, classification of polymers, Types of polymerization, Mechanism of polymerization: Chain and step. Plastics: Chemistry of Thermoplastic resins (PE, PVC, PS & Nylon) and thermosetting resins (Bakelite). Conducting Polymers- Poly acetylene, Poly aniline & Ploy pyrrole. Fibers- Poly ester, Nylon-6, 6 & Nylon 6, 10.

Unit – 5:

Water Chemistry

Introduction, Types of hardness, units and Numerical problems, Estimation of hardness of water-EDTA method and Numerical problems, Boiler Troubles- Scale and sludge, caustic embrittlement & Boiler corrosion. Treatment of Boiler feed water- Lime-soda, Zeolite and Ion-exchange process. Numerical problems, Desalination of brackish water- Reverse Osmosis and Electro dialysis.

Text Books:

1. Text Book of Engineering Chemistry by C. Parameshwara Murthy. B.S. Publications
2. Text Book of Engineering Chemistry by Y. Bharathi kumara and Jyotsna Cherikuri, VGS Buplications.
3. Text Book of Engineering Chemistry by Shashi Chawla
4. Text Book of Engineering Chemistry by B. Ramadevi & Ch. Venkata Ramana Reddy, CENGAGE Learning 2012.

Reference Books:

1. Elementary principles of Physical Chemistry by P.W. Atkins, Oxford University Press.
2. Physical Chemistry by Puri & Sharma
3. Engineering Chemistry by Jain & Jain
4. Engineering Chemistry by Shashi Chawla.
5. Polymer Chemistry by Gourikar.
6. Physical Chemistry Glastone.

Learning Outcomes:

1. Applications of electrochemistry understanding different types of cells, their representation, knowledge of electrode potentials, utilization of electrical energy and conversation into different energies.
2. Applicability of electrodes in different fields of analysis.
3. Understanding the utility of batteries as a source of energy in many electronic gadgets & their types.
4. Enhancement of power generation by making of fuel cells. Knowledge of need for alternate source of energy.
5. Deterioration of metal under the influence of environment, mechanism of corrosion, factors affecting corrosion, prevention of corrosion using various methods & a basic knowledge of surface coatings.
6. Improving the properties of plastics by various additives, integral role of various polymers in our life style & applicability of plastic in automobile and textile industry.
7. Knowledge of hardness of water and its effect, industrial utility of water especially for steam generation, removal methodologies of hardness & treatment of brackish or salty water.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING GRAPHICS

I Year I-Sem EEE, ECE, CSE (A91301)	**L T P C**
II- Sem Civil, Mech (A92301)	**2 0 4 4**

COURSE OBJECTIVES:

1. Use various engineering drawing instruments.
2. Learn the basic conventions of drawings, dimensioning, scales and conic sections like ellipse, parabola and hyperbola.
3. Learn projections of points, lines viewed in different positions
4. Learn projections of plane surfaces and solids viewed in different positions.
5. Gain knowledge of sections of solids and their usage in real time applications.
6. Attain the concepts of isometric, orthographic projections.

UNIT – I

INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Drawing and their significance- Drawing Instruments and their use. Principle of Dimensioning. Geometrical Constructions of regular polygons.
Conic Sections: Ellipse, Parabola & Hyperbola (General Method only).
Cycloidal Curves: Cycloid, epi-cycloid & hypo-cycloid.
Involutes: Circle, square, pentagon & hexagon**.**
Scales: Plain scale, Diagonal scale & Vernier scale.

UNIT – II

ORTHOGRAPHIC PROJECTIONS IN FIRST ANGLE PROJECTION: Principles of Orthographic Projections – Conventions – First and Third Angle projections.
PROJECTIONS OF PLANES : Surface inclined to both the Principal Planes.
PROJECTIONS OF RIGHT REGULAR SOLIDS: Axis inclined to both the Principal planes.

UNIT – III

SECTIONS AND SECTIONAL VIEWS: Right Regular Solids – Prism, Cylinder, Pyramid, Cone & Auxiliary views.
DEVELOPMENT OF SURFACES: Right Regular Solids – Prism, Cylinder, Pyramid, Cone and their parts.

UNIT – IV

ISOMETRIC PROJECTIONS : Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines.
TRANSFORMATION OF PROJECTIONS : Conversion of Isometric Views to Orthographic Views& Vice versa.

UNIT – V

Introduction to Computer aided Drafting and generation of simple figures by using circle, line, Rectangle & Arc, etc.,

TEXT BOOKS

1. Engineering Drawing, N.D. Bhatt
2. Engineering Drawing – Basant, Agrawal, TMH

REFERENCES :

1. Engineering Graphics. P I Varghese Tata McGraw Hill Education Pvt. Ltd.
2. Engineering drawing – P.J. Shah .S.Chand Publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill Book Publishers.
4. Engineering Drawing – M.B. Shah and B.C. Rana, Pearson.
5. Engineering Drawing by K.Venu Gopal& V.Prabu Raja New Age Publications.
6. Engineering Drawing By John. PHI Learning Publisher.

COURSE OUTCOMES:

The students will be able to

1. Understand and draw the different types of conic sections.
2. Analyze the projections of points, straight lines, plane surfaces, solids at different positions and angles.
3. Convert orthographic views into isometric views and vice versa.
4. Perform sections of solids, development of surfaces and their applications in human life.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGLISH LANGUAGE COMMUNICATIONS SKILLS LAB

	L	T	P	C
I Year I-Sem: MECH. & EEE (A91005)				
II-Sem: CIVIL, CSE & ECE (A92007)	**0**	**0**	**3**	**2**

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

Objectives:
- To facilitate computer-aided multi-media instruction enabling individualized and independent language learning
- To sensitise the students to the nuances of English speech sounds, word accent, intonation and rhythm
- To bring about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking
- To improve the fluency in spoken English and neutralize mother tongue influence
- To train students to use language appropriately for interviews, group discussion and public speaking

Learning Outcomes:
- Better Understanding of nuances of language through audio- visual experience and group activities
- Neutralization of accent for intelligibility
- Speaking with clarity and confidence thereby enhancing employability skills of the students

Syllabus:
English Language Communication Skills Lab shall have two parts:

a. **Computer Assisted Language Learning (CALL) Lab**

b. **Interactive Communication Skills (ICS) Lab**

The following course content is prescribed for the **English Language Communication Skills Lab**

Exercise – I
CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking Activity and JAM Sessions
Intensive Practice in Articles, Prepositions, Word Formation- Prefixes & Suffixes, Synonyms & Antonyms with Software/Handouts

Exercise – II
CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms - Consonant Clusters.
ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing Others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.

Concord (Subject in agreement with verb) and Words Often Misspelt- Confused/Misused

Exercise- III
CALL Lab: Minimal Pairs- Word Accent and Stress Shifts- Listening Comprehension.
ICS Lab: Descriptions- Narrations- Giving Directions and Guidelines.
Sequence of Tenses, Question Tags and One Word Substitutes.

Exercise-IV
CALL Lab: Intonation and Common Errors in Pronunciation.
ICS Lab: Extempore- Public Speaking
Active and Passive Voice, –Common Errors in English, Idioms and Phrases

Exercise-V
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer- Oral Presentation Skills
Reading Comprehension and Job Application with Resume Preparation.

Minimum Requirement of Infrastructural Facilities for ELCS Lab:

1. **Computer Assisted Language Learning (CALL) Lab:**
   The Computer Aided Language Lab for 40 students with 40 systems, one master console, LAN facility and English language software for self- study by learners.
   System Requirement (Hardware Component):
   Computer network with LAN with minimum 60 multimedia systems with the following specifications:
   i) P – IV Processor
      a) Speed – 2.8 GHZ
      b) RAM – 512 MB Minimum
      c) Hard Disk – 80 GB
   ii) Headphones of High Quality

2. Interactive Communication Skills (ICS) Lab :

The Interactive Communication Skills Lab: A spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system, camcorder etc.

Prescribed Lab Manual: A Manual entitled "***English Language Communication Skills (ELCS) Lab Manual- cum- Work Book****"*, published by Cengage Learning India Pvt. Ltd, New Delhi. 2013.

- *In addition to the prescribed lab manual, all the listening and speaking activities mentioned in Text-1 and Text-2 can be conducted in the English Language Communication Skills Lab.*

Suggested Software:

- **Macmilan Dictionary Modern English** (with CD)**.**
- **Oxford Advanced Learners' Dictionary** (with CD).
- **Cambridge Advanced Learners' English Dictionary with CD.**
- **Grammar Made Easy by Darling Kindersley**
- **Punctuation Made Easy by Darling Kindersley**
- Clarity Pronunciation Power – Part I
- Clarity Pronunciation Power – part II
- **Oxford Advanced Learner's Compass, 8th Edition**

- ***DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.***
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **English in Mind (Series 1-4), Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge**
- **English Pronunciation in Use** (Elementary, Intermediate, Advanced) Cambridge University Press
- Raman, M & Sharma, S. 2011. Technical Communication, OUP
- Sanjay Kumar & Pushp Lata. 2011. Communication Skills, OUP

SUGGESTED READING:

1. Situational Enlgish, Prof. Damodar 33 situations BIE Publications (with CD)
2. Radio lessons, Prof. G. Damodar.
3. Rama Krishna Rao, A. *et al. English Language Communication Skills – A Reader cum Lab Manual Course Content and Practice.* Chennai: Anuradha Publishers
4. Suresh Kumar, E. & Sreehari, P. 2009. *A Handbook for English Language Laboratories.* New Delhi: Foundation
5. *Speaking English Effectively* 2nd Edition by Krishna Mohan and N. P. Singh, 2011. Macmillan Publishers India Ltd. Delhi.
6. Sasi Kumar, V & Dhamija, P.V. *How to Prepare for Group Discussion and Interviews.* Tata McGraw Hill
7. Hancock, M. 2009. *English Pronunciation in Use. Intermediate.* Cambridge: CUP
8. Spoken English: A Manual of Speech and Phonetics by R. K. Bansal & J. B. Harrison. 2013. Orient Blackswan. Hyderabad.
9. Hewings, M. 2009. *English Pronunciation in Use. Advanced.* Cambridge: CUP
10. Marks, J. 2009. *English Pronunciation in Use. Elementary.* Cambridge: CUP
11. Nambiar, K.C. 2011. *Speaking Accurately. A Course in International Communication.* New Delhi : Foundation
12. Soundararaj, Francis. 2012. *Basics of Communication in English. New Delhi: Macmillan*
13. *Spoken English* (CIEFL) in 3 volumes with 6 cassettes, OUP.
14. *English Pronouncing Dictionary* Daniel Jones Current Edition with CD.
15. *A Textbook of English Phonetics for Indian Students* by T.Balasubramanian (Macmillan)
16. *Topical Thoughts – (A Textbook of Reading and Writing Skills) Dr.P. Satyanarayana, Vaagdevi College of Engineering, Warangal Publications, 2013.*

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A91006) APPLIED PHYSICS LAB

I Year I-Sem:ECE, CSE & EEE

L	T	P	C
0	0	3	2

Objectives:

The purpose of doing the experiments in laboratory is not simply to verify a principle but also to explore the other related phenomena and to find their applicability. The students are suggested to work in this direction and get benefit out of it.

1. To get practical knowledge which is related to the engineering course in the development of new technologies.
2. To impart fundamental knowledge in handling the equipment in Physics laboratory.
3. To offer practical experience on the basic equipment related to engineering Physics.
4. For practical understanding of the theoretical concepts of Physics.
5. To develop inquisitiveness in handling physics equipment leading to new technologies.

S. No.	Name of the Experiment
1.	Study of LED and LASER diode characteristics.
2.	Torsional Pendulum-determination of rigidity modulus of material of a wire.
3.	Determination of energy gap of material of p-n junction.
4.	Bending losses of optical fibres and evaluation of numerical aperture of a given optical fibre.
5.	Study of Decay of charge & determination of time constant of an RC circuit.
6.	Determination of resonant frequency and quality factor of LCR circuit.
7.	Study of Characteristics of solar cell
8.	Determination of wavelength of Laser source – Diffraction grating.
9.	Determination of frequency of AC supply-sonometer.
10.	Determination of dispersive power of a material of a prism-spectrometer.

Laboratory Manual:

1. The Laboratory manual of Engineering Physics by Dr. Y. Aparna & Dr. K. Venkateshwar Rao, VGS Publications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

ENGINEERING WORKSHOP

	L	T	P	C
I Year I-Sem: Civil, EEE & ECE (A91303)				
II-Sem: CSE & Mech (A92303)	**0**	**0**	**3**	**2**

COURSE OBJECTIVES:

1. Know the usage of various tools and their application in carpentry, tin smithy.
2. Know the usage of various tools and their application in black smithy, foundry, welding and house wiring.
3. Make lap joint and dove tail joint in carpentry.
4. Make scoop, funnel and tray like items in tin smithy.
5. Use one-way, two-way switches, parallel and series connections in house wiring.
6. Know the basics of welding.

I. TRADES FOR EXERCISES :

(Any **six** trades from the following for Mechanical Engineering Branch & Any four trades for all other Branches with minimum of **two** exercises in each trade)

1. **Carpentry**
2. **Fitting**
3. **Tin-Smithy**
4. **Black Smithy**
5. **House-wiring**
6. **Foundry**
7. **Plumbing**

II. Trades for Demonstration & Exposure

1. **Demonstration of power tools & wiring**
2. **Welding**
3. **Machine Shop**

III. **IT Workshop I:** Computer hardware, identification of parts, Disassembly, Assembly of computer to working condition, simple diagnostic exercises.

IT Workshop II: Installation of operating system windows and linux simple diagnostic exercises.

TEXTBOOKS:

1.Workshop Manual – P.Kannaiah / K.L.Narayana / Scitech Publishers.

2. Workshop Manual- Venkat Reddy /BS Publications / 6th Edition.

COURSE OUTCOMES:

The students will be able to

1. Know the fundamental knowledge of various trades and their usage in real time applications
2. Gain knowledge of Foundry, Welding, Black smithy, Fitting, Machine shop and house wiring
3. Understand the basis for analyzing power tools in construction and wood working, electrical engineering and mechanical engineering.
4. Use basic concepts of computer hardware for assembly and disassembly.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92001) MATHEMATICS – II
(Common for all Branches)

I Year II-Sem

L	T	P	C
4	1	0	4

Course Objective:

The main aim of this subject is to improve the mathematical knowledge of the student. When the student study the mathematics-II he should get the impression that mathematics is a systematic science of practical importance, resting on a relatively small number of basic concepts and involving powerful unifying methods. He should soon convince himself of the necessity for applying mathematical procedures to engineering problem.

By studying the mathematics the students translating the given physical information into mathematical model. This model may be a differential equation, a system of equation or some other mathematical expression.

Unit-I :

Solution of Linear System:

Matrix and types of matrices Elementary row and column operations on a matrix, Rank of matrix –Echelon and Normal form – Inverse of a matrix using elementary operations, linear dependence and independence of vectors, solutions of systems of linear equations using elementary operations, and direct methods-Gauss elimination, LU-decomposition.

Unit-II:

Eigen values and Eigen vectors:

Eigen values and Eigen vectors of a matrix and their properties, Cayley-Hamillton theorem and its applications, Diagonalization of a matrix, Quadratic forms – Reduction of a quadratic form to canonical form by linear transformation and orthogonal transformation and nature, signature index of a quadratic form, Complex matrices-Hermitian, skew-hermitian and Unitary matrices.

Unit – III:

Fourier series:

Determination of Fourier Coefficients, Even and Odd functions, Half Range Fourier sine and cosine expansions Fourier series in an arbitrary interval.

Fourier transforms: Fourier integrals, Fourier sine and cosine integrals. Fourier transforms Fourier sine and cosine transforms- Properties- Inverse transforms- Finite Fourier transforms

Unit – IV:

Vector Calculus:

Scalar and Vector fields; Vector Differentiation, Level surfaces – directional derivative – Gradient of scalar field, Divergence and Curl of a vector field – Laplacian – Line and surface integrals; Green's theorem, Gauss Divergence theorem, Stoke's theorem (without proof).

Unit – V:

Partial differential equation:

Formation of partial differential Equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear and non-linear Equations. Method of separation of variables, for 2^{nd} order Equations. Applications of partial differential Equations.

Recommended Text Books:

1. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2008
2. B. S. Grewal : Higher Engineering Mathematics, Khanna Publications, 2009.

Reference Book:

1. T.K.V.Iyengar:Mathematical Methods, S.Chand and Company.
2. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8^{th} Edition.
3. A textbook of Engineering Mathematics Vol-I by P.B.Bhaskara Rao, S.K.V.S. Rama chary
4. A textbook of Engineering Mathematics Vol-I by C. Shankaraiah, VGS Book Link

Course Outcomes:

By studying Mathematics-II students are able to find the rank of matrix and they can find eigen values & eigen vectors of different engineering fields. They use concept of matrices in the development of programming languages and by studying the fourier series & fourier transforms students are able to solve the problems related to theory of circuits and many applications in electronic engineering and communications engineering.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92004) ENVIRONMENTAL STUDIES

I Year II-Sem: EEE, ECE & CSE

L	T	P	C
4	0	0	4

Objectives:

1. Understanding the importance of ecological balance for sustainable development.
2. Understanding the impacts of developmental activities and mitigation measures.
3. Understanding the environmental policies and regulations.

UNIT-I:

Ecosystems

Definition, Scope and Importance of ecosystem. Classification, structure and function of an ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Bioaccumulation, Biomagnification, ecosystem value, services and carrying capacity, Field visits.

UNIT-II:

Natural Resources:

Classification of Resources, Living and Non-Living resources, water **resources:** use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. **Mineral resources:** use and exploitation, environmental effects of extracting and using mineral resources, **Land resources:** Forest resources, **Energy resources:** growing energy needs, renewable and non renewable energy sources, use of alternate energy source, case studies.

UNIT-III:

Biodiversity And Biotic Resources:

Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habital loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

UNIT-IV:

Environmental Pollution and Control Technologies: Environmental Pollution: Classification of pollution, **Air Pollution:** Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. **Water pollution:** Sources and types of pollution, drinking water quality standards. **Soil Pollution:** Sources and types, Impacts of modern agriculture, degradation of soil. **Noise Pollution:** Sources and Health hazards, standards, **Solid waster:** Municipal Solid Waste management, composition and characteristics of e-Waste and its management. **Pollution control technologies:** Wastewater Treatment methods: Primary, secondary and Tertiary.

Overview of air pollution control technologies, Concepts of bioremediation. **Global Environmental Problems and Global Efforts:** Climate change and impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montreal Protocol.

UNIT-V:

Environmental Policy, Legislation & EIA:

Environmental Protection act, Legal aspects Air Act-1981, Water Act, Forest Act, Wild life Act, Municipal solid waste management and handling rules, biomedical waster management and handling rules, hazardous waste management and handling rules. EIA:EIA structure, methods of baseline data acquisition. Overview on Impacts of air, water, biological and Socio-economical aspects. Strategies for risk assessment, Concepts of Environmental Management Plan (EMP). **Towards Sustainable Future:**

Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

SUGGESTED TEXT BOOKS:

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.
2. Environmental Studies by R. Rajagoplalan, Oxford University Press.

REFERENCE BOOKS:

1. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi.
2. Environemtal Engineering and science by Gilbert M. Masters and Wendell P. Ela 2008 PHI Learning Pvt. Ltd.
3. Environmental Science by Daniel B. Botkin & Edward A.Keller, Wiley INDIA edition.
4. Environmental Studies by Anubha Kaushik, 4th Edition, New age international publishers.
5. Text book of Environmental Science and Technology – Dr. M. Anji Reddy 2007, BS Publications.

Learning Outcomes:

1. The students can realize the need and importance of ecosystem in the globalised sector.
2. Students knows the importance of living and non-leaving organism in the universe.
3. Students can take the steps to mitigate pollution in the environment.
4. Student understanding the important of environmental impact assessment and it's acts.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92005) COMPUTATIONAL MATHEMATICS

I Year II-Sem: EEE & ECE

L	T	P	C
2	0	0	2

Course Objective:

The main aim of the computational mathematics is to examine the constructive abstract methods of mathematics when illustrated with suitable numerical techniques. Computational methods which were developed for purely theoretical reasons suddenly becomes of great importance in engineering mathematics. It follows that the most important objective and purpose in engineering mathematics seems to be that the student become familiar with mathematical thinkings.

Unit – I:

Solutions of algebraic and transcendental equations:
Introduction, Numerical solution of algebraic and transcendental equations by Bisection Method, Regular-Falsi method
Iteration method, Newton-Raphson's method.

Unit – II:

Interpolation:
Interpolation Introduction-Errors in polynomial Interpolation, Finite differences-Forward Differences-Backward differences-central differences Symbolic relations and separation of symbols, Newton's formulae for interpolation. Gauss central Difference Formulae, Interpolation with un-equally spaced points-Lagrange's Interpolation formula.

Unit – III:

Curve Fitting:
Least square method- Fitting of a straight line-Second degree curve, Exponential curve-power curve.

Unit – IV:

Numerical Differentiation & Integrations:
Numerical differentiation of 1^{st} & 2^{nd} order. Numerical Integration with Trapezoidal rule, Simpson's $1/3^{rd}$ rule, Simpson's (3/8) rule

Unit – V:

Numerical solutions of ordinary Differential Equations:
Solutions of first order ordinary differential equations by Taylor's series, Picard's Method, Euler's Method, Euler's -Modified Method, Runge-kutta methods.

Recommended Text Books:

1. B.S.Grewal : Higher Engineering Mathematics, Khanna Publications, 2009.
2. M.K. Jain S.R.K. Iyengar and R.K.Jain: Numerical methods for Scientific andEngineering Computation,Wiley Eastern

Reference Book:

1. Erwyn Kreyszig : Advanced Engineering Mathematics, John Wiley and Sons, 8th Edition.
2.T.K.V.Iyengar: Mathematical Methods, S.Chand and Company.
3. R.K.Jain and S.R.K.Iyengar : Advanced Engineering Mathematics, Narosa Publishing House, 2008
4. Mathematical Methods by P.B. Bhaskar Rao, S.K.V.S.Rama Chary, M.Bhujanya Rao, B.S.Publications
5. Mathematical Methods by K.V. Suryanarayana Rao, by Scitech Publications

Course Outcomes:

By studying Numerical Techniques students are able to solve transcendental equations and solving higher order difference and integrations and also to write the programmes on numerical techniques and matrices.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92006) HUMAN VALUES AND PROFESSIONAL ETHICS

I Year II-Sem: Civil, EEE & Mech

L	T	P	C
2	0	0	2

Unit 1 Human Values: Morals, values, ethics – integrity – work ethics –service learning – civic virtue – respect for others- living peacefully - Caring –sharing –honesty – courage – valuing time – cooperation – commitment –empathy – self-confidence –spirituality – character- Mini-Cases

Unit II Professional Ethics: Profession- and professionalism - Two models of professionalism –Professional etiquette -Three types of Ethics or morality Responsibility in Engineering – Engineering standards –Engineering Ethics – Positive and Negative Faces. Professional Codes and Code of conduct (as given by ASME, ASCE, IEEE, IETE, Institute of Engineers as Guidelines for ethical conduct). Mini-cases.

Unit III Professional Responsibilities: Ethical standards Vs Professional Conduct – Zero Tolerance for Culpable Mistakes – Hazards and Risks- Risk benefit analysis– congeniality, collegiality and loyalty. Respect for authority – conflicts of interest – occupational crime — Mini-Cases.

Unit IV Professional Rights: professional rights and employee rights communicating risk and public policy – Whistle blowing - collective bargaining. Professionals /engineers as managers, advisors, experts, witnesses and consultants – moral leadership- Regulatory compliances, Monitoring and control- Mini-Cases

Unit V Ethics in global context: Global issues in MNCs- Problems of bribery, extortion, and grease payments – Problem of nepotism, excessive gifts – paternalism – different business practices – negotiating taxes. Mini-Cases.

Mini-projects

Project 1: The student of this course should invariably attend (or watch on internet/any TV channel/youtube/social media) two speeches of 30 minutes duration each dealing with spiritual discourse and submit a report on the contents of the lecture proceedings.

Project 2: Visit any organization (including shops/ hotels or shopping malls in your region) of your choice and observe how the professionals perform the given job with a focus on professional ethics and human values.

References

1. Aryasri, *Human Values and Professional Ethics*, Maruthi Publications.
2. S B George, *Human Values and Professional Ethics,* Vikas Publishing.
3. KR Govindan & Saenthil Kumar:Professional *Ethics and Human Values*, Anuradha Publications.
4. S K Chakraborthy & D.Chakraborthy: *Human Values and Ethics*, Himalaya.
5. M. Govindarajan, S. Natarajan, & V.S. Senthilkumar: *Engineering Ethics(Includes Human Values),* HI Learning Pvt. Ltd., New Delhi – 110001

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92201) ELECTRICAL CIRCUITS-I

I Year II-Sem: EEE

L	T	P	C
4	1	0	4

Course Objectives:

- The course introduces the basic concept of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline, The emphasis of this course is laid on the basic analysis of circuits which includes Single phase circuits, magnetic circuits and theorems.

UNIT-I:

Introduction to Electrical Circuits:

Essence of electricity, Electric field electric current, potential difference, E.M.F, electric power Ohm's law, R-L-C parameters, Voltage and current sources, dependent and independent sources, transformation Voltage & Current relationship for passive elements for different input signals (square, ramp, saw-tooth, triangular).

KCL, KVL, network reduction techniques, series, parallel, series-parallel, Star-Delta, Delta-Star transformations. Nodal analysis, Mesh analysis, Super node and Super mesh for DC excitations.

UNIT-II:

Single phase AC Circuits:

R.M.S, average values and from factor for different periodic wave forms-steady state analysis of R, L, C (in different combination) with sinusoidal excitation –concept of reactance, impedance, susceptance and admittance. Phase and phase difference, concept of power factor, real and reactive power, J-notation, complex and polar forms of representation, complex power.

UNIT-III:

Locus diagram and Resonance:

Locus diagram: Series R-L, R-C, R-L-C and parallel combination with variation of various parameters. Resonance: Series, parallel circuits, concept of bandwidth and Q-factor.

UNIT-IV:

Network Theorems (with D.C and A.C Excitation)

Super position, Reciprocity, Norton's, Thevenin's, Maximum power transfer, Milliman's Tellegen's and compensation theorems and Problems.

UNIT-V:

Magnetic Circuits:

Magnetic circuits, Faraday's laws of electromagnetic induction – concept of self and mutual inductance, Dot convention, coefficient of coupling, composite magnetic circuits, analysis of series and parallel magnetic circuits.

Text Books:

1. Engineering Circuit analysis by William Hayt and Jack E. Kemmerly, McGraw Hill Company, 6th edition.
2. Network Analysis by A.Sudhakar and Shyammohan S Palli, Tata MC Graw Hill
3. Electrical Circuits by A.Chakrabarthy, Dhanpat Rai & Sons.

Reference Books:

1. Network Analysis by M.E. Van Valkenberg.
2. Linear Circuit Analysis (time domain, Phasor and Laplace transform approaches) Second edition by Raymond A. Decarlo and Penmin – L in, Oxford University Press. Second edition, 2004.
3. Electrical Circuit Theory by K.Rajeswaram, Pearson Education, 2004.
4. Basic Circuit Analysis by D.R. Cunningham & J.A. Stuller, Jaico Publications.

Course Outcomes:

- After going through this course the student gets a thorough knowledge on basics of circuit concepts, electrical parameters, single phase AC circuits, magnetic circuits, resonance and network theorems with which he/she can able to apply the above conceptual things to real-world problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92402)ELECTRONIC DEVICES AND CIRCUITS

I Year II-Sem: EEE

L	T	P	C
4	1	0	4

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

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

UNIT - I:

P-N Junction Diode: Qualitative Theory of P-N Junction, P-N Junction as a Diode, Diode Equation, Volt- Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion Capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.
Special Purpose Electronic Devices: Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode, SCR and Semiconductor Photo Diode.

UNIT-II:

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

UNIT-III:

Bipolar Junction Transistor and UJT: The Junction Transistor, Transistor Current Components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT Symbol, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation , BJT Specifications, BJT Hybrid Model, Determination of h-parameters from Transistor Characteristics, Comparison of CB, CE, and CC Amplifier Configurations, UJT and Characteristics.

UNIT-IV:

Transistor Biasing and Stabilization: Operating Point, The DC and AC Load lines, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector - Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization

against variations in VBE and β, Bias Compensation using Diodes and Transistors, Thermal Runaway, Thermal Stability, Analysis of a Transistor Amplifier Circuit using h- Parameters.

UNIT-V:

Field Effect Transistor and FET Amplifiers

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

FET Amplifiers: FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT and FET.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Integrated Electronics – J. Millman and Christos C. Halkias, 1991 Ed., 2008, TMH.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, 9 Ed., 2006, PEI/PHI.
3. Electronic Devices and Circuits - K. Lal Kishore, 2 Ed., 2005, BSP.
4. Electronic Devices and Circuits – S.Salivahanan, N.Suresh Kumar, A.Vallavaraj, 2 Ed., 2008, TMH.

Course Outcomes:

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

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

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROBLEM SOLVING & COMPUTER PROGRAMMING

I Year I-Sem: ECE & CSE (A91503) **LTPC**
II-Sem: EEE (A92503) **4 0 0 4**

Objectives:

To provide the necessary knowledge on general engineering problem solving methodologies and to provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language and to prepare the students to write modular and readable C Programs. Also the Course introduces the essential concepts like abstract data types, user defined data types, to analyze the performance of algorithms and how to use such knowledge for later processing with the help of files and aims to train the students to write working programs to solve problems.

Syllabus Content

Unit-1 (20%)

Meaning of Problem Solving – Polya's 4 Steps: Understanding the problem, Devising a plan, Carrying out the Plan, Looking back – Examples. (5%)

Introduction to programming, Algorithms and Flowcharts. Basics of C Language. Input and Output. Elementary problems and program writing. (15%)

Unit-2 (20%)

Control Statements in C: Conditional Execution and Selection, Iterative and Repetitive Execution, Termination. Nested Loops.

Arrays and Strings: Working with One-Dimensional Arrays, String Manipulation. Working with Multidimensional Arrays, Manipulating String Arrays.

Functions: Prototypes and Definition, Working with Functions, Passing Parameters To Functions. Introduction to Recursion.

Scope and Storage Classes.

Unit-3 (20%)

Pointers in C: Preliminary Concepts – One-Dimensional Arrays and Pointers, Pointers and Strings, Pointer Arithmetic, Pointers to Pointers, Arrays of Pointers, Pointers to an Array, Multidimensional Arrays and Pointers, Pointers to Functions, Arrays of Function Pointers, Dynamic Memory Handling and Problems.

Unit-4 (20%)

User Defined Data Types and Variables. Structures, Unions, Enumeration Types, Bitwise Operators, Command-Line Arguments, C Preprocessor, Memory Models and Pointers.

Unit-5 (20%)

Files In C: Using Files in C, Working with Text Files, Working with Binary Files, Direct File Input and Output. Files of Records, Random Access into Files of Records – File Management Functions.

Text Book

1. *Programming in C*, Pradip Dey & Manas Ghosh, 2nd Ed., Oxford University Press, 2013 (Chapters 1, 2, 3, 4, 5 excluding 5.2.6, 6.1 to 6.8, 6.10.1, 7, 8, 9, 11)

Reference Books:

1. *How to Solve it - A New Aspect of Mathematical Method* - G.Polya, 1945, Princeton University Press, (Pages 1-29)
2. *How to Solve it by Computer* – R.G. Dromey, Prentice Hall of India, 1999, (Pages 1-39)
3. *Computer Programming*, E. Balaguruswamy, McGraw Hill India (Pvt Ltd), 2014 (Pages 1.1 to 6.19)
4. *Problem Solving and Program Design in C*, Jeri R. Hanly, Elliot B. Koffman, 7th Edition, Pearson Education, 2013.
5. *C Programming – A Modern Approach,* K. N. King, 2nd Edition, W. W. Norton & Company; New York, 2008.
6. *Programming in C – A Complete Introduction To The C Programming Language,* Stephen G. Kochan 3rd Ed., Sams Publishing, 2005.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-7: A broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts.

Learning Outcomes:

1. Understanding how problems are posed and how they can be analyzed for obtaining solutions.
2. Understanding the fundamentals of C programming.
3. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
4. Implementing different operations on arrays and creating and using of functions to solve problems.
5. Ability to design and implement different types of file structures using standard methodology.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A92009) COMPUTATIONAL MATHEMATICS LAB

I Year II-Sem: EEE & ECE

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Interpolation:

Programming Tasks:

1. a) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Newton's interpolation both forward and backward)
   b) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Lagrange 's interpolation)
   c) Write a C program to determine y for a given x, if two arrays of x and y of same size are given.(using Gauss interpolation)
   (Selection criteria of the interpolation formula are important.)

Curve fitting:

Programming Tasks:

2. a) Write a C program to find a line of best fit from the given two arrays of x and y of same size.
   b) Write a C program to find a curve of the form $y = Ae^{Bx}$ from the given two arrays of x and y of same size.
   c) Write a C program to find a curve of the form $y = Ax^B$ from the given two arrays of x and y of same size.
   d) Write a C program to find a curve of the form $y = Ax^2 + Bx + C$ from the given two arrays of x and y of same size.

Solution of Algebraic and Transcendental Equations

Programming Tasks:

3. a) Write a C program to find the root of a given equation using bisection method.
   (Write this program such that the initial values given to the system are not usable, then the system should ask us to give new set of initial values)
   b) Write a C program to find the root of a given equation using method of false position(regula false position)
   c) Write a C program to find the root of a given equation using iteration method.
   d) Write a C program to find the root of a given equation using Newton Rophson method

Linear system of equations

Programming Tasks:

4. a) Write a C program to find the solution of given system of linear equations using L- U decomposition method
   b) Write a C program to find the solution of given system of linear equations using jacobi's method
   c) Write a C program to find the solution of given system of equations using Gauss sidel iteration method

d) Write a C program to find the solution of given system of equations using Gauss Jordan elimination method

Numerical Differentiation, Integration, and Numerical solutions of First order differential equations:

Programming Tasks:

5. a) Write a C program to evaluate definite integral using trapezoidal rule, Simpson's $1/3^{rd}$ rule and $3/8^{th}$ rule.
   b) Write a C program to solve a given differential equation using Taylor's series
   c) Write a C program to solve a given differential equation Euler's and modified Eulers method
   d) Write a C program to solve a given differential equation using Ruge-Kutta method.

Text Books:

1) Introductory methods of numerical analysis by SS Sastry
2) Numerical and statistical methods with programming in c by Sujatha Sinha and Subhabrada Dinda, Scitec publishers

References:

1) Advanced engineering mathematics by Alan Jeffery
2) Applied numerical methods using matlab by Rao.V. Dukkipati, New Age Publishers
3) Numerical methods in science and engineering –A practical approach by S. Rajasekharan, S. Chand Publications

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

PROBLEM SOLVING & COMPUTER PROGRAMMING LAB

I Year I-Sem: ECE & CSE (A91503) **LTPC**
II-Sem: EEE (A92504) **0 0 3 2**

Objectives:

To provide the necessary knowledge and practical training on general engineering problem solving methodologies and to provide necessary foundations for step by step computer program development and to present the basic concepts in C programming language and to prepare the students to write modular and readable C Programs. Also the Lab Course implements the essential concepts like abstract data types, user defined data types, to analyze the performance of algorithms and how to use such knowledge for later processing with the help of files and aims to train the students to write working programs to solve problems.

Syllabus Content

1.a Analyze the problem of finding areas of shapes like circle, square, rectangle and triangle. Draw a flow chart.

1.b Analyze the problem of finding the area of a quadrilateral assuming that we know how to find the area of a triangle. Draw a flow chart.

2.a Analyze the problem of finding, in shortest time, the sum of first n natural numbers, sum of squares of first n natural numbers, sum of cubes of first n natural numbers and sum of squares of squares of first n natural numbers. Draw a flow chart.

2.b Analyze the problem of finding the second largest number in a set of n numbers. Draw a flow chart.

3. Write a C program to implement Problems 1.a and 1.b (given above).

4.a Write a C program to find the sum of individual digits of a positive integer.

4.b Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

4.c Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

5.a Write a C program to find the roots of a quadratic equation.

5.b Write a C program to find the factorial of a given integer.

5.c Write a C program to find the GCD (greatest common divisor) of two given integers.

6.a Write a C program to solve Towers of Hanoi problem.

6.b Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

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

7.b Write a C program to reverse the elements of an array (i.e., the first value should become last value etc.)

8. Write a C program that uses functions to perform all of the following:

   i. Reading of a matrix.

   ii. Printing a matrix in a formatted form.

   iii. Adding two compatible matrices to produce a result matrix

   iv. Multiplying two compatible matrices to produce a result matrix.

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

   i. To insert a sub-string in to a given main string from a given position.

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

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

10.a Write a C program using pointer to create a two dimensional matrix, to input values in to the matrix and to display the matrix and its transpose. Free the memory properly.

10.b Write a C program to demonstrate calling of a function (like add,subtract,multiply) using a function pointer.

11.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.

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

12. Write a menu driven C program that uses functions to perform the following operations on complex numbers stored in a structure:

   i. Reading a complex number
   ii. Writing a complex number
   iii. Addition of two complex numbers
   iv. Multiplication of two complex numbers

13.a Write a C program which copies one text file to another text file and verify the correctness.

13.b Write a C program which copies one binary file to another binary file and verify the correctness.

13.c Write a command-line C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

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

14.b Write a C program to produce reverse of the content of a text fie into another text file and verify the result.

14.c Write a C program to merge two text files into a third text file (i.e., the contents of the first file followed by those of the second are put in the third file) and verify the correctness.

15. Write an interactive C program that will maintain a list (roll,name,totalmarks) of student records. The menu shall have options like

   i. Add a new record
   ii. Delete a record

iii. Modify a record
iv. Display a selected record
v. Display all records
vi. Quit

16. Write a C Program that removes all comment lines from a C source file.

Text Book

1. *Programming in C*, Pradip Dey & Manas Ghosh, 2nd Ed., Oxford University Press, 2013 (Chapters 1, 2, 3, 4, 5 excluding 5.2.6, 6.1 to 6.8, 6.10.1, 7, 8, 9, 11)

Reference Books:

1. *How to Solve it - A New Aspect of Mathematical Method* - G.Polya, 1945, Princeton University Press, (Pages 1-29)
2. *How to Solve it by Computer* – R.G. Dromey, Prentice Hall of India, 1999, (Pages 1-39)
3. *Computer Programming*, E. Balaguruswamy, McGraw Hill India (Pvt Ltd), 2014 (Pages 1.1 to 6.19)
4. *Problem Solving and Program Design in C*, Jeri R. Hanly, Elliot B. Koffman, 7th Edition, Pearson Education, 2013.
5. *C Programming – A Modern Approach,* K. N. King, 2nd Edition, W. W. Norton & Company; New York, 2008.
6. *Programming in C – A Complete Introduction To The C Programming Language,* Stephen G. Kochan 3rd Ed., Sams Publishing, 2005.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: A broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts.

Learning Outcomes:

1. Understanding how problems are posed and how they can be analyzed for obtaining solutions.
2. Understanding the fundamentals of C programming.
3. Learning of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.
4. Implementing different operations on arrays and creating and using of functions to solve problems.
5. Ability to design and implement different types of file structures using standard methodology.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93001) MATHEMATICS-III

II Year B.Tech. I-Sem, EEE

L	T	P	C
4	1	0	4

Course Objective:

The main aim of teaching mathematics-III to develop the thinking ideas of students. In this we made the choice with great care, using past and present techniques, research experience and resulting the temptation to include everything which is important in Engineering Mathematics. Hence the student should learn to recognize the guiding principles and ideas behind the scenes which are more important than formal manipulations.

Unit – I: Functions of complex variables: Limit- Continuity – Differentiability, Analyticity properties Cauchy – Riemann conditions, Harmonic and conjugate Harmonic functions, Milne – Thompson method, complex potential functions .

Unit – II: Complex integration: Line integral – Cauchy's theorem, Cauchy's integral formula and derivatives.
Complex power series, Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series. Types of singular points –Isolated singular point – pole – essential singular point.

Unit – III: Calculus of Residues: Residues-Cauchy's Residue Theorem, Laurent series. Evaluation of integrals of the type

(a) Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_0^{2\pi} f(\cos\theta, \sin\theta)d\theta$

Unit – IV: Conformal mapping: Transformation of z-plane to w-plane by a function, conformal transformation Standard transformations-Translation; Magnification and rotation; inversion and reflection, Transformations like e^z, logz, z^2 and Bilinear transformation. Properties of Bilinear transformation.

Unit – V: Z –Transforms and Difference equations: Z–transformation, shifting theorems, multiplication by n, Initial value theorem, Final value theorem problems, Evaluation of inverse Z-transforms, Convolution theorem, solving of difference equations by using z-transforms.

Recommended Text Books

1) B.S.GREWAL : Higher Engineering Mathematics, Khanna Publications, 2009.
2) R.K.JAIN and S.R.K.IYENGAR : Advanced Engineering Mathematics,
3) James Ward Brown, Ruel V. Churchill , Complex Variables and Applications, Narosa Publishing House, 2008

REFERENCE BOOK:

1) ERWYN KREYSZIG : ADVANCED ENGINEERING MATHEMATICS, JOHN WILEY AND SONS, 8TH EDITION.
2) T.K.V.IYENGAR: ENGINEERING MATHEMATIC-III, S.CHAND AND COMPANY.

Course Outcomes:

By studying Mathematics – III the students are able to transform the trigonometric functions into the algebraic functions. By studying complex variable the students identifying ordinary point, singular point and regular point for the given ordinary differential equations. By using the Z-transforms students find the particular solution of the differential equation without finding the general solution and students are able to solve the applications of differential equations with boundary and initial conditions.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93201) ELECTROMAGNETIC FIELDS

II Year B.Tech. EEE I-Sem **L T P C**
4 1 0 4

Pre requisites:
Knowledge of Mathematics, Vector Algebra and Basic concepts Engineering Physics.

Objectives:
The objective of this course is
- To introduce the concepts of electric field and magnetic fields and their applications
- To utilize the concepts in the development of power transmission and telecommunication lines and electrical machines.

UNIT-I
Electrostatics:
Types of Co-ordinate systems: Rectangular, Cylindrical, Spherical system.
Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Guass's law – Application of Guass's Law – Maxwell's first law, div $\mathbf{D}=\rho_v$ – Laplace's and Poison's equations – Solution of Laplace's equation in one variable. Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field.

UNIT-II
Dielectrics & Capacitance:
Behavior of conductors in an electric field – Conductors and Insulators – Electric field inside a dielectric material – polarization –Boundary conditions –Conductor and Dielectric Boundary conditions– Capacitance – Capacitance of parallel plates, spherical and co-axial capacitors – with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of continuity

UNIT-III
Magneto Statics:
Static magnetic fields – Biot-Savart's law – Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current carrying wire – Relation between magnetic flux, magnetic flux density and Magnetic field intensity – Maxwell's second Equation div($\mathbf{B}$)=0.

Ampere's Law & Applications:
Ampere's circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere's circuital law – Maxwell's third equation, Curl ($\mathbf{H}$)=$\mathbf{Jc}$.

UNIT – IV

Force in Magnetic fields and Magnetic Potential:

Force in Magnetic fields: Magnetic force - Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors – Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a current loop placed in a magnetic field.

Magnetic Potential and Concept of Inductance: Scalar magnetic potential and its limitations – vector magnetic potential and its properties –vector Poisson's equations - Self and Mutual inductance – Neumann's formulae – 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:

Time varying fields – Faraday's laws of electromagnetic induction– Maxwell's fourth equation: Curl (**E**) = $-\partial\mathbf{B}/\partial t$ – Statically and Dynamically induced EMFs – Simple problems - Modification of Maxwell's equations for time varying fields– Integral and point forms – Concept of Displacement current, Modified form of Ampere's Law for TV fields, Power in EM Fields and Poynting theorem.

TEXT BOOKS

1. "Engineering Electromagnetics" by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2009.
2. "Electromagnetic Fields" by Matthew.N.O.Sadiku, Oxford Publications
3. Elements of Electromagnetic Fields by S. P. Seth, Dhanpat Rai Publications.

REFERENCE BOOKS:

1. "Introduction to ElectroMagnetics" by CR Paul and S.A. Nasar, Mc-Graw Hill Publications
2. " Engineering Electro magnetics" by Nathan Ida, Springer(India) Pvt. Ltd. 2nd Edition
3. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd edition
4. "Electromagnetics" by Plonsy and Collin
5. "Static and Dynamic Electricity" Smyth.
6. "Electromagnetics" by J P Tewari.
7. "Electromagnetics" by J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.

OUTCOMES:

After completion of this course the student will have the knowledge regarding-

- The relation between the electric field and the magnetic field, about the various laws governing the concepts of these fields.
- The behavior of conductors and dielectrics, their boundary conditions, Maxwell's equations with respect to electrostatics and magneto statics.
- The concepts related to time varying fields, about scalar and vector magnetic potential, self and mutual inductance.
- The phenomena of energy stored and energy density in electrostatics and magneto statics, the concepts of conduction, convection and displacement current density, their equations, Power in EM fields and Poynting theorem.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93202) ELECTRICAL CIRCUITS-II

II Year B. Tech. EEE I- Sem

L	T	P	C
4	1	0	4

Pre-Requisites: To learn this course, the students are required to have the basic concepts out of the following subjects:
Electrical Circuits-I, Mathematics-I, Mathematics-II

Objectives:
This course introduces the basic concepts of circuit analysis which is the foundation for all subjects of the Electrical Engineering discipline. The Emphasis of this course is laid on the basic analysis of circuits which includes

- Circuit analysis using Graph theory
- Analysis of Three Phase balanced and unbalanced circuits
- DC and AC Transient analysis
- Concept of s-domain in electrical circuit analysis
- Analyzing Two-Port Networks using various network parameters
- Concept and Design of various types of passive Filters
- Fourier analysis of A.C. Circuits and Fourier Transforms

UNIT – I Network topology
Definitions – Graph – Tree, Basic cut-set and Basic Tie-set matrices for planar networks – Loop and Nodal methods of analysis of Networks with dependent & independent voltage and current sources - Duality & Dual networks.

UNIT – II Three Phase Circuits:
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 active and reactive power.

UNIT – III Transient Analysis:
Transient response of R-L, R-C, R-L-C circuits (Series and Parallel combinations) for D.C. and sinusoidal excitations – Initial conditions – Classical method and Laplace transforms methods of solutions.

Transient response of the above circuits for different inputs such as step, ramp, pulse and impulse by using Laplace transforms method.

UNIT – IV Network functions and Network Parameters:
Network functions: Driving point and transfer impedance and admittance functions- poles and zeros of network function–necessary conditions for driving point functions and transfer functions.
Network Parameters: Two port Network parameters – Z, Y, ABCD and Hybrid parameters and their inter-relations– 2-port network parameters using transformed variables.

UNIT – V Filters and Fourier analysis of A.C. Circuits:

Filters - Introduction to filters –low pass – high pass and band pass – RC, RL, filters-constant K and m derived filters and composite filter design

Fourier analysis of A.C. Circuits – Fourier Theorem, consideration of symmetry, exponential form of Fourier series, line and phase angle spectra, Fourier integrals and Fourier transforms properties of Fourier transforms.

OUTCOMES:

After going through this course the student gets a thorough knowledge on

- Network topology
- Analysis of Balanced and Unbalanced Three-phase systems
- Measurement of power in 3-Phase Systems using wattmeters
- Transient analysis of AC and DC networks; Solution of problem using Differential Equation and Laplace transform approach
- Different types of network functions
- Two–port network parameters
- Operation and design of various filter circuits
- Fourier transforms
- Analysis of AC circuit through Fourier series

With which he/she can be able to apply the above conceptual things to the real world electrical and electronics problems and applications.

TEXT BOOKS:

1. Engineering circuit analysis – by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
2. Fundamentals of Electric Circuits by Charles Alexander and Mathhew N.O. Sadiku, 5th Edition, Mc Graw Hill.
3. Electrical Circuits by David .A. Bell Oxford University Press, 7th Edition.
4. Networks and systems by D. Roy Chowdary, New Age International publishers
5. Circuit Theory by A. Chakrabarthy, Dhanpat Rai & Sons.

REFERENCE BOOKS:

1. Network Analysis by Van Valkenburg, PHI.
2. Network Theory by N.C. Jagan & C. Lakshminarayana, B.S Publications.
3. Electric Circuit theory by K. Rajeswaran, Pearson Education, 2004.
4. Network Analysis by C.K. Mithal, Khanna Publishers.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93203) ELECTRICAL MACHINES - I

II Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Pre requisites:
Electrical Circuits, Magnetic Fields.
Objectives:

- To introduce the concept of rotating machines and the principle of Electro mechanical energy conversion.
- To understand the functioning of different types of D.C. generators and study their performance.
- To study the working principles of various types of D.C. motors and their load characteristics, starting and methods of speed control.
- To estimate the various losses occurring in D.C. machines and to study the different testing methods to arrive at their efficiency.

UNIT – I Electromechanical Energy Conversion:
Electromechanical Energy Conversion **-** Forces and torque in magnetic field systems **-** Energy balance **-** Energy and force in a singly excited magnetic field system, determination of magnetic force, Co – Energy **-** Multi excited magnetic field systems.

UNIT – II D.C. Generators Construction & Operation:
D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – E.M.F Equation –Problems.
Armature reaction: Cross magnetizing and de-magnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation.

UNIT – III Types of D.C Generators & Characteristics:
Methods of Excitation – separately excited and self-excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self-excite and remedial measures. Load characteristics of shunt, series and compound generators. Applications, Problems with Practical Ratings.
Parallel operation of D.C series generators **-** Use of equalizer bar and cross connection of field windings **-** Load sharing**.**

UNIT – IV D.C Motors Operation & Speed control:
D.C Motors – Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation. Applications, Problems with Practical Ratings.
Speed control of D.C. Motors: Armature voltage and field flux control methods. DC Motor starters (3 point and 4 point starters).

UNIT – V Testing of D.C. machines:
Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency.

Methods of Testing – direct, indirect and regenerative testing – Brake test – Swinburne's test Hopkinson's test – Field's test-separation of stray losses in a D.C. motor test.

TEXT BOOKS:

1. Electrical Machines – P.S. Bimbra., Khanna Publishers
2. Electric Machines by I. J. Nagrath & D. P. Kothari, Tata Mc Graw – Hill Publishers, 3rd edition, 2004.
3. Theory and Performance of Electrical Machines by J. B. Gupta, S. K. Kataria and Sons.

REFERENCE BOOKS:

1. Performance and Design of D.C Machines – by Clayton & Hancock, BPB Publishers
2. Electric Machinery – A. E. Fitzgerald, C. Kingsley and S. Umans, Mc Graw-Hill Companies, 5th edition
3. Electromechanical Energy Conversion with Dynamics of Machines – by R. D. Begamudre, New Age International (P) Ltd., Publishers, 2nd edition, 1998.
4. Electric Machines – M. V. Deshpande, PHI Learning Pvt.Ltd.

OUTCOMES:

After going through this course the student gets a thorough knowledge on.

- Principle of Energy Conversions.
- Construction and Operation of Generators & Motors.
- Characteristics of Different Generators & Motors, Remedies to overcome the Problems of failure of Generation.
- Applications and Speed control of DC Motors.
- Testing of DC Machines.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93505) DATA STRUCTURES THROUGH C++

II Year B.Tech. I-Sem EEE & ECE **LTP C**
4 1 0 4

Objectives:

To provide a comprehensive working knowledge on the object oriented language C++ and to implement abstract data types, linear and nonlinear data structures for problem solving. To provide a foundation on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide a working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

UNIT-1

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling. Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

UNIT-2

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++. Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

UNIT-3

Priority Queues _ Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

UNIT-4

Search Trees: Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations _ Insertion, Deletion and Searching. Trees definitions, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees

Graphs: Basic terminology, representations of graphs, graph search methods DFS, BFS.

UNIT-5

Text Processing : Pattern matching algorithms-Brute force, the Boyer _Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

Text Books:

1. *Data Structures: A Pseudocode Approach with C++,* Richard F Gilberg, Behrouz A Forouzan, Cengage Learning
2. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
3. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and Mount, Wiley student edition, John Wiley and Sons.

References:

1. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
3. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek,Cengage Learning.
4. Data Structures Using C++, D.s. Malik,Cengage Learning, India Edition.
5. Mastering Algorithms with C,K.Loudon,O'Reilly,SPD PVT.Ltd.
6. An introduction to Data structures and algorithms, J.A.Storer,Springer.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.

CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.

CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.

CO-4: An ability to communicate effectively, both in writing and oral.

CO-5: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93204) ELECTRICAL CIRCUITS LAB

II Year B.Tech. EEE I-Sem

L	T	P	C
0	0	3	2

The following experiments are required to be conducted as compulsory experiments:

1. Verification of Kirchhoff's laws and Tellegen's Theorem
2. Verification of Thevenin's, Norton's and Maximum Power Transfer Theorems.
3. Verification of Superposition and Reciprocity Theorems.
4. Locus Diagrams of RL and RC Series Circuits.
5. Series and Parallel Resonance.
6. Determination of Self, Mutual Inductances and Coefficient of coupling.
7. Determination of Open circuit, Short circuit and ABCD parameters of two port networks.
8. Measurement of active and reactive powers of a 3-phase network using two wattmeter method.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

1. Verification of Compensation and Millman's Theorems.
2. Verification of RMS value of complex wave.
3. Relation between voltage and current in star and delta networks**.**
4. Verification of Time response of first order (R-C & R-L) and Second order (RLC) networks for periodic non-sinusoidal inputs – Time constant and Steady state error determination.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93508) DATA STRUCTURES THROUGH C++ Lab

I Year B.Tech. II-Sem: EEE, ECE **L T P C**
0 0 3 2

Objectives:

To provide a comprehensive working knowledge on the object oriented language C++ and to provide implementation experience on abstract data types, linear and nonlinear data structures for problem solving. To provide a working knowledge on generic programming based on over loading concepts, inheritance and virtuality. To inculcate ability to grasp the behaviour of data structures such as stacks, queues, trees, hash tables, search trees, graphs and their representation and to apply them in problem solving. To provide an application oriented working knowledge on searching and sorting techniques and to write programs to solve problems on arrays, linked lists, stacks, queues, trees, graphs, hash tables and search trees.

Syllabus Content

1. Write a C++ program to implement all the functions of a dictionary ADT.
2. Write a C++ program for skip lists.
3. Write a C++ program for hashing with quadratic programming.
4. C++ programs using class templates to implement the following using an array.
   a) Stack ADT b) Queue ADT
5. Write C++ programs using class templates to implement the following using a singly linked list.
   a) Stack ADT b) Queue ADT
6. Write C++ programs using class templates to implement the deque (double ended queue) ADT using a doubly linked list and an array.
7. Write C++ programs, using class templates, that use non-recursive functions to traverse the given binary tree in
   a) preorder b) inorder and c) postorder.
8. Write C++ programs, using class templates, that use recursive functions to traverse the given binary tree in
   a) preorder b) inorder and c) postorder.
9. Write a C++ program using class templates to perform the following operations:
   a) Insert an element into a binary search tree.
   b) Delete an element from a binary search tree.
   c) Search for a key element in a binary search tree.
10. Write C++ programs using class templates for the implementation of bfs and dfs for a given graph.
11. Write C++ programs using class templates for implementing the following sorting methods:
    a) Merge sort b) Heap sort
12. Write a C++ program using class templates to perform the following operations
    a) Insertion into a B-tree b) Deletion from a B-tree
13. Write a C++ program using class templates to perform the following operations

a) Insertion into an AVL-tree b) Deletion from an AVL-tree

14. Write a C++ program using class templates to implement Kruskal_s algorithm to generate a minimum cost spanning tree.
15. Write a C++ program using class templates to implement Prim_s algorithm to generate a minimum cost spanning tree.
16. Write a C++ to implement Knuth-Morris-Pratt pattern matching algorithm.

Text Books:

1. Data structures a pseudo code approach with c++, Indian edition, R.F.Gilberg and B.A.Forouzan Cengage Learning.
2. Programming Prinicples and Practice using C++, B.Stroustrup, Addition-Wiesly (Pearson Education)
3. Data Structures and STL,W.J.Collins,mc Graw Hill,Internationational Edition.
4. Data Structures and Algorithms with OODesign patterns in C++,B.R.Priess,John Wiley &sons.
5. The Art,Philosophy and Science of OOP with C++,Rick Miller,SPD.
6. C++ for Programmers ,P.J.Deitel and H.M.Deitel,PHI/Pearson.

Course Outcomes:

CO-1: A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.
CO-2: An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
CO-3: Ability to model, understand, and develop complex software for System Software as well as Application Software.
CO-4: An ability to communicate effectively, both in writing and oral.
CO-5: A recognition of the need for, and an ability to engage in life-long learning.

Learning Outcomes:

1. Understanding of fundamental concepts of abstract data types and general standard data structures.
2. Ability to design linear data structures stacks, queues and linked lists.
3. Ability to design nonlinear data structures, trees and graphs, and to implement their operations.
4. Ability to implement different searching and sorting techniques.
5. Ability to apply different searching and sorting techniques for real world problems..

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A93407) ELECTRONIC DEVICES AND CIRCUITS LAB

II Year B.Tech. EEE I-Sem

L	T	P	C
0	0	3	2

PART A: (Only for Viva-voce Examination)
Electronic Workshop Practice (In 3 Lab Sessions):

1. Identification, Specifications, Testing of R, L, C Components (Color Codes) Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
   i) Multimeters (Analog and Digital)
   ii) Function Generator
   iii) Regulated Power Supplies
   iv) CRO.

PART B: (For Laboratory Examination – Minimum of 10 experiments)
1. Forward & Reverse Bias Characteristics of PN Junction Diode
2. Zener diode characteristics
3. Zener voltage Regulator.
4. Half Wave Rectifier
5. Half Wave Rectifier with filters.
6. Full Wave Rectifier
7. Full Wave Rectifier with filters.
8. Input & Output Characteristics of Transistor in CB Configuration.
9. Input & Output Characteristics of Transistor in CE Configuration and
10. h-parameter calculations from CE characteristics
11. FET characteristics.
12. Design of self bias circuit

PART C: Equipment required for Laboratories:
1. Regulated Power supplies (RPS)-(0-30) V
2. CRO's
3. Function Generators-(0-1)MHz.
4. Multimeters
5. Ammeters (Analog or Digital)
6. Voltmeters (Analog or Digital)
7. Electronic Components -Resistors, Capacitors, BJTs,

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94201) POWER SYSTEMS-I

II Year B.Tech. EEE II-Sem **L T P C**
4 1 0 4

Pre requisites:
Basics of Electrical Circuits, Electrical Machines and Thermal & Hydro Prime Movers.

Objectives:
- Electrical Power Generation by Conventional Energy Sources.
- Concepts of DC and AC Distribution, Voltage drop calculations
-
- This course concerns the generation of power along with the economic aspects.

UNIT-1 Thermal Power Stations:
Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses. - Brief description of TPS components: Economizers, Boilers, Super heaters, Condensers, Chimney and cooling towers. Numerical Problems.
Nuclear Power Stations:
Nuclear Power Stations: Nuclear Fission and Chain reaction. - Nuclear fuels. - Principle of operation of nuclear reactor.-Reactor Components: Moderators, Control rods, Reflectors and Coolants. - Radiation hazards: Shielding and Safety precautions. - Types of Nuclear reactors and brief description of PWR, BWR and FBR. Numerical Problems.

UNIT –II Gas and Hydroelectric Power Stations:
Gas Power Stations: Principle of Operation and Components.
Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies. Numerical Problems.

UNIT-III D.C. Distribution Systems:
Classification of Distribution Systems.- Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems.- Requirements and Design features of Distribution Systems.-Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

A.C. Distribution Systems:
Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

UNIT-IV Substations, Power Factor Control and Voltage Control:
Substations: Classification of substations - Indoor & Outdoor substations: Substations layout showing the location of all the substation equipment. Bus bar arrangements in the Sub-

Stations: Simple arrangements like single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams.
Power Factor Control: Causes and disadvantages of Low Power factor-Methods of improving power factor-Most economical power factor-Numerical Problems.
Voltage Control: Dependency of Voltage on Reactive Power Flow - Methods of Voltage Control.

UNIT-V Economic Aspects of Power Generation:
Load curve, load duration and integrated load duration curves-load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems.
Tariff:
Costs of Generation and their division into Fixed, Semi-fixed and Running Costs. Desirable Characteristics of a Tariff-Objectives of Tariff-Types of Tariff-Numerical Problems**.**

TEXT BOOKS
1. Generation, Distribution and Utilization of electrical energy by C.L.Wadhwa, New age International Publishers.
2. Elements of Electrical Power Station Design, 3rd Edition, Wheeler. Pub.1998-M.V.Deshpande.
3. Power System Engineering- by R.K.Rajput Laxmi Publications (P) Limited, New Delhi 2006.

REFERENCE BOOKS
1. Principles of Power Systems by V.K Mehta and Rohit Mehta S.CHAND& COMPANY LTD., New Delhi 2004.
2. Electrical Power Generation, Transmission and Distribution by S.N.Singh., PHI, 2003.
3. Hand book of Switchgear (BHEL) Tata Mc-Graw Hill Publication 2009.

OUTCOMES:
After going through this course the student gets
- Knowledge on the thermal, nuclear, gas and Hydel power plants operation, AC and DC distribution, voltage drop calculations
- Air insulated indoor/outdoor substations, operation.
- Voltage control and power factor improvement techniques, economics aspects of power generation
- Different types of tariff

With which he/she can be able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94202) ELECTRICAL MACHINES – II

II Year B. Tech. EEE II-Sem

L	T	P	C
4	1	0	4

Pre requisites:
Electrical Circuits and Electrical Machines – I

Objectives:
- To study the theory and performance of various Transformers
- To study the testing techniques of single phase transformer
- To study theory of operation and performance characteristics of poly phase induction motors
- To study the theory of speed control techniques of 3-phase induction motor.

UNIT I: Single Phase Transformers -Construction & Operation:
Single phase transformers – constructional details –minimization of hysteresis and eddy current losses –e.m.f equation –operation on no load and on load – phasor diagrams. Equivalent circuit –losses and efficiency – regulation. All day efficiency –effect of variation of frequency & supply voltage on iron losses-Numerical Problems

UNIT II: Testing of Single Phase Transformer:
OC and SC tests- predetermination of efficiency and regulation- Sumpner's test- – Separation of core losses in a transformer . Parallel operation with equal and unequal voltage ratios-Numerical Problems

UNIT III: Auto & Polyphase Transformers:
Autotransformers –equivalent circuit – comparison with two winding transformers.
Polyphase transformers –Polyphase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ, and open Δ. Third harmonics in phase voltages –three winding transformers –tertiary windings- determination of Zp, Zs, and Zt transients in switching –off load and on load tap changing transformers, Scott connection. -Numerical Problems

UNIT – IV: Polyphase Induction Motors:
Polyphase induction motors-construction details of cage and wound rotor machines-production of rotating magnetic field - principle of operation - rotor EMF and rotor frequency - rotor reactance, rotor current and pf at standstill and during operation. -Numerical Problems

Characteristics of Induction Motors:
Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation - expressions for maximum torque and starting torque – torque-slip characteristics - equivalent circuit - Phasor diagram - crawling and cogging. -Numerical Problems

UNIT – V: Circle Diagram & Speed Control of Induction Motors:

No-load Test and Blocked rotor test –Predetermination of performance using Circle Diagram-Numerical Problems -Methods of starting-Starting current and Torque calculations.

Speed Control Methods:

Speed control-change of voltage, change of frequency, V/f, injection of an EMF into rotor circuit – Numerical Problems- Induction generator – principle of operation and its role in electrical systems.

TEXT BOOKS:

1. Electrical machines-PS Bhimbra, Khanna Publishers.
2. Electric Machines –by I.J.Nagrath & D.P.Kothari, Tata McGraw Hill, 7th Edition.2009
3. Theory and Performance of Electrical Machines – J.B. Gupta, S.K. Kataria & Son's Publications
4. Performance and Design of AC Machines-M.G. Say. BPB Publishers.

REFERENCE BOOKS:

1. Electric machinery - A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition
2. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition.
3. Electrical Machines – M.V Deshpande, Wheeler Publishing

OUTCOMES:

After going through this course

- The student gets a thorough knowledge on, construction operation characteristics and testing of different types of transformers.
- Testing (concept of circle diagram) and speed control method of poly-phase induction motor
- He/she can be able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94203) ELECTRICAL MEASUREMENTS

II Year B.Tech. EEE II-Sem

L	T	P	C
4	1	0	4

Pre requisites:
Electrical Circuits, Electronic Devices and Circuits, Electromagnetic fields and Electrical Machines

Objectives:
This course introduces

- The basic principles, construction and working of all Electrical and Electronic measuring instruments.
- It also deals with the measurement of R, L, C parameters, voltage, current, power, Power factor, energy, frequency, and magnetic measurements and non-electrical quantity measurements.

UNIT-I: INTRODUCTION TO MEASURING INSTRUMENTS:

Classification – deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of range using shunts and series resistance. Electrostatic Voltmeters-electrometer type and attracted disc type – Extension of range of E.S. Voltmeters.

UNIT– II: POTENTIOMETERS & INSTRUMENT TRANSFORMERS:

Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance- A.C. Potentiometers: polar and coordinate type- standardization – applications.
Instrument Transformers-CT and PT – Ratio and phase angle errors-Numerical Problems.

UNIT –III: MEASUREMENT OF POWER & ENERGY:

Single phase dynamometer wattmeter, LPF and UPF dynamometer wattmeter, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems.
Single phase induction type energy meter – driving and braking torques – errors and compensations – testing by phantom loading using R.S.S. meter. Three phase energy meter – tri-vector meter, maximum demand meters.

UNIT – IV: D.C & A.C BRIDGES:

Measurement of Resistance: Measurement of low, medium and high resistance – Sensitivity of Wheat-stone bridge – Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, Measurement of high resistance – loss of charge method.

Measurement of inductance and Q-Factor - Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge.
Measurement of capacitance and loss angle – De'Sauty Bridge. Wein's bridge – Schering Bridge.

UNIT-V: TRANSDUCERS AND ELECTRONIC INSTRUMENTS:

Classification of transducers, Characteristics and choice of transducers, Peizo-electric transducers, LVDT and capacitor transducers; LVDT Applications, Strain gauge, gauge factor, Digital shaft Encoders, Tachometers, Hall-Effect Sensors, Thermocouples.

ELECTRONIC INSTRUMENTS: Electronic display Devices-Digital Voltmeters, CRO-Measurement of Voltage and Frequency-Lissajous Patterns-Wave analyzers-Harmonic Distortion analyzer.

TEXT BOOKS:

1. Electrical & Electronic Measurement & Instruments, A.K.Sawhney, Dhanpat Rai & Co. Publications.
2. Electrical and Electronic Measurements and Instrumentation, R. K. Rajput, S. Chand & Company Ltd.

REFERENCE BOOKS:

1. Electrical Measurements and measuring Instruments, E.W. Golding and F.C. Widdis, fifth Edition, Wheeler Publishing.
2. Electrical and Electronic Measurements, G. K. Banerjee, PHI Learning Pvt. Ltd.
3. Electrical Measurements, Buckingham and Price, Prentice Hall of India Publications
4. Electrical Measurements: Fundamentals, Concepts, Applications, Reissland, M.U, New Age International (P) Limited, Publishers.

Outcomes:
Student is able to:

- Understand the basic principles behind Electrical measuring instruments.
- Assess the use of cause and effect relationships between electrical quantities for constructing instruments
- Choose a right measuring instrument suitable for an appropriate application taking into consideration the operating conditions.
- Understand the concepts and principles of electronic measuring instruments.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94305)THERMAL AND HYDRO PRIME MOVERS

II Year B. Tech. EEE II-Sem

L	T	P	C
4	1	0	4

Course objectives:
The objectives of the course are:

- To make the students understand the various types of prime movers which can be connected to generators for power production
- To impart the knowledge of various types of pumps.

UNIT-I STEAM POWER PLANTS
Boilers- working principle of Benson boiler and Lamont boilers.
Steam Turbines: Schematic layout of steam power plant, Classification of Steam Turbines-Impulse Turbine and Reaction Turbine, Compounding in Turbines
Condensers - Working principle of jet and surface condensers.

UNIT-II GAS TURBINE
Introduction, applications, types of gas turbines, working principle of open and closed cycle gas turbine. Methods to improve thermal efficiency of gas turbine, gas turbine fuels, starting of plant, comparison with diesel and steam power plants.

UNIT-III DIESEL POWER PLANT
Introduction, diesel engine working principle, diesel fuels, diesel electric plant main components, super charging.

UNIT-IV HYDRAULIC TURBINES
Introduction, Classification of hydraulic turbines, working principles of Pelton wheel, Francis turbine, Kaplan Turbine. Governing of Impulse & Reaction Turbine, Needs & Efficiency.

UNIT-V PUMPS
Centrifugal pumps-types, working principle, Multi stage centrifugal pumps.
Reciprocating pumps-types, working principle.

TEXT BOOKS:

1. Thermal Engineering-by RK Rajput, Laxmi Pubilcations
2. Fluid Mechanics & Hydraulic Machines – by Modi & Seth, PHI Publications.

REFERENCE BOOKS:

1. Gas Turbines – by V Ganesan, Tata McGraw-Hill Companies
2. Fluid Mechanics & Hydraulic Machines – by R. K. Bansal, Laxmi Pubilcations
3. Internal Combustion Engines – by V Ganesan, Tata McGraw-Hill Companies.
4. PK Nag – Power Plant Engineering, TMH publication
5. Gas turbine theory-HIH Sarvanmuttoo,H Cohen,GFC Rogers, Pearson Education India.

Course Outcomes:

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

- Describe the basic components of steam power plants and working principles of different types of steam turbines
- Explain the working principle of different types of gas turbines
- Identify the main components of diesel power plant and explain the working principle of diesel engines
- Discuss the working principle of different types of hydraulic turbines
- Illustrate the working principle of centrifugal and reciprocating pumps

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94401) SWITCHING THEORY AND LOGIC DESIGN

II Year B.Tech. II-Sem EEE

L	T	P	C
4	0	0	4

Course objectives:

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

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

UNIT-I:
Number System and Boolean Algebra And Switching Functions:
Review of number systems, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Error Detecting and Correcting Codes.
Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

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

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

Shift Registers, Design and Operation of Ring and Twisted Ring Counter, Operation Of Asynchronous And Synchronous Counters.

UNIT-IV:

Sequential Circuits-I:

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

UNIT-V:

Sequential Circuits-II:

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

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

TEXT BOOKS:

1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rdEdition, Cambridge.
2. Switching Theory and Logic Design – A Anand Kumar, PHI,2013.

REFERENCE BOOKS:

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

Course Outcomes:

Upon completion of the course, students should possess the following skills:

- Be able to manipulate numeric information in different forms, e.g. different bases, signed integers, various codes such as ASCII, Gray, and BCD.
- Be able to manipulate simple Boolean expressions using the theorems and postulates of Boolean algebra and to minimize combinational functions.
- Be able to design and analyse small combinational circuits and to use standard combinational functions/building blocks to build larger more complex circuits.
- Be able to design and analyse small sequential circuits and devices and to use standard sequential functions/building blocks to build larger more complex circuits.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94402) PULSE AND DIGITAL CIRCUITS

II Year B.Tech. II-Sem EEE	**L**	**T**	**P**	**C**
	4	**0**	**0**	**4**

Objectives:

The main objectives are:

- To explain the complete response of R-C and R-L-C transient circuits.
- To explain clippers, clampers, switching characteristics if transistors and sampling gates.
- To construct various multivibrators using transistor, design of sweep circuits and sampling gates.
- To discuss and realize logic gates using diodes and transistors.

UNIT-I:

Linear Wave Shaping: High pass and low pass RC circuits and their response for Sinusoidal, Step, Pulse, Square, & Ramp inputs, High pass RC network as Differentiator, Low pass RC circuit as an Integrator, Attenuators and its application as a CRO Probe, RL and RLC Circuits and their response for Step Input, Ringing Circuit.

UNIT-II:

Non-Linear Wave Shaping: Diode clippers, Transistor clippers, Clipping at two independent levels, Comparators, Applications of Voltage comparators. Clamping Operation, Clamping circuit taking Source and Diode resistances into account, Clamping Circuit Theorem, Practical Clamping Circuits, Effect of Diode Characteristics on Clamping Voltage, Synchronized Clamping.

UNIT-III:

Multivibrators: Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using Transistors.

UNIT-IV:

Time Base Generators: General features of a Time base Signal, Methods of Generating Time Base Waveform, Transistor Miller Time Base generator, Transistor Bootstrap Time Base Generator, Transistor Current Time Base Generators, Methods of Linearity improvement.

Synchronization and Frequency Division: Pulse Synchronization of Relaxation Devices, Frequency division in Sweep Circuits, Stability of Relaxation Devices, Astable Relaxation Circuits, Monostable Relaxation Circuits, Synchronization of a Sweep Circuit with Symmetrical Signals, Sine wave frequency division with a Sweep Circuit, A Sinusoidal Divider using Regeneration and Modulation.

UNIT-V

Sampling Gates: Basic operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, Four Diode Sampling Gate, Reduction of pedestal in Gate Circuits

Realization of Logic Gates Using Diodes & Transistors: AND, OR and NOT Gates using Diodes and Transistors, DCTL, RTL, DTL, TTL and CML Logic Families and its Comparison

TEXT BOOKS:

1. Millman's Pulse, Digital and Switching Waveforms –J. Millman, H. Taub and Mothiki S. Prakash Rao, 2 Ed., 2008, TMH.
2. Solid State Pulse Circuits –David A. Bell, 4 Ed., 2002 PHI.

REFERENCE BOOKS:

1. Pulse and Digital Circuits – A. Anand Kumar, 2005, PHI.
2. Fundamentals of Pulse and Digital Circuits- Ronald J. Tocci, 3 Ed., 2008.
3. Pulse and Digital Circuits – Motheki S. Prakash Rao, 2006, TMH.
4. Wave Generation and Shaping - L. Strauss.

Outcomes:

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

- Understand the applications of diode as integrator, differentiator, clippers, clampler circuits.
- Learn various switching devices such as diode, transistor, SCR
- Difference between logic gates and sampling gates.
- Design multivibrators for various applications, synchronization.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94206) ELECTRICAL MACHINES LAB - I

II Year B. Tech. EEE II-Sem

L	T	P	C
0	0	3	2

The following experiments are required to be conducted compulsory experiments:

1. Magnetization characteristics of DC shunt generator.
2. Load test on DC shunt generator.
3. Load test on DC series generator.
4. Load test on DC compound generator.
5. Swinburne's test on DC Shunt Machine and Speed control of DC shunt motor.
6. Brake test on DC compound motor.
7. Hopkinson's test on DC shunt machines.
8. Field's test on DC series machines.

In addition to the above eight experiments, at least any two of the experiments from the following list are required to be conducted:

9. Brake test on DC shunt motor.
10. Retardation test on DC shunt motor.
11. Separation of constant losses in DC shunt motor.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94207) BASIC SIMULATION LAB

II Year B. Tech. EEE II-Sem

L	T	P	C
0	0	3	2

The following experiments are required to be conducted as compulsory experiments using PSPICE/MATLAB software:

1. Nodal Analysis.
2. Simulation of DC Circuits.
3. DC Transient response.
4. Simulation of Frequency response of second order RLC series circuit.
5. Simulation of Time response of second order RLC series circuit.
6. Simulation of Frequency response of second order RLC Parallel circuit
7. Simulation of Time response of second order RLC Parallel circuit.
8. Verification of superposition and Thevenin's Theorems.
9. Generation of Various Signals and Sequences (Periodic and A periodic), such as Unit Impulse, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sine waves.

In addition to the above nine experiments, at least any three of the experiments from the following list are required to be conducted using PSPICE/MATLAB software:

1. Computation of Unit sample, Unit step and Sinusoidal responses of the given LTI system and verifying its physical reliability and stability properties.
2. Finding the Fourier Transform of a given signal and plotting its magnitude and phase spectrum.
3. Waveform Synthesis using Laplace Transform.
4. Locating the Zeros and Poles and plotting the Pole-Zero maps in S-plane and Z-Plane for the given transfer function.
5. Locus Diagram of RL & RC circuits with variation of R, L, C.
6. Verification of Maximum Power Transfer Theorem.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A94006) GENDER SENSITIZATION

II Year B.Tech. II-Sem

L	T	P	C
2	0	0	0

Pre-Requisites: None

Course Objectives:

- To develop students sensibility with regard to issue of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

Unit – 1
Gender: Why Should We Study It?

Unit – 2
Socialization: Making Women, Making Men
2.1 Introduction
2.2 Preparing for womanhood
2.3 Growing up male
2.4 First lessons in caste
2.5 Different masculinities

Unit – 3
Housework: The Invisible Labour
3.1 "My mother does not work"
3.2 "Share the load"

Unit – 4
Missing Women: Sex Selection and Its consequences
4.1 Declining sex ratio
4.2 Demographic consequences

Unit – 5
Knowledge: Through the Lens of Gender
5.1 Point of view
5.2 Gender and the structure of knowledge
5.3 Further reading: Unacknowledged women artists of Telangana

Unit – 6
Sexual Harassment: Say No!
6.1 Sexual harassment, not eve-teasing
6.2 Coping with everyday harassment
6.3 Further reading: "Chupulu"

Unit – 7
Women' Work: Its Politics and Economics
7.1 Fact and fiction
7.2 Unrecognized and unaccounted work
7.3 Further reading: Wages and conditions of work

Unit – 8
Domestic Violence: Speaking Out
8.1 Is home a safe place?
8.2 When women unite [Film]
8.3 Rebuilding lives
8.4 Further reading: New forums for justice

Unit – 9
Whose History? Questions for Historians and Others
9.1 Reclaiming a past
9.2 Writing other histories
9.3 Further reading: Missing pages from modern Telangana history

Unit – 10
Gender Spectrum: Beyond the Binary
10.1 Two or many?
10.2 Struggles with discrimination

Unit – 11
Thinking about Sexual Violence
11.1 Blaming the victim
11.2 "I fought for my life…"
11.3 Further reading: The caste face of violence

Unit – 12
Just Relationships: Being Together as Equals
12.1 Mary Kom and Onler
12.2 Love and acid just do not mix
12.3 Love letters
12.4 Mothers and fathers
12.5 Further Reading: Rosa Parks – The braveheart

Unit – 13
Additional Reading: Our Bodies, Our Health

Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labor and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95201) POWER SYSTEMS-II

III Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objective:

- This course is an extension of Power systems-I course.
- It deals with basic theory of transmission lines modeling and their performance analysis.
- Also this course gives emphasis on mechanical design of transmission lines, cables and insulators.

UNIT-I: TRANSMISSION LINE PARAMETERS

Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems. Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT-II: PERFORMANCE OF SHORT AND MEDIUM LENGTH TRANSMISSION LINES

Classification of Transmission Lines - Short, medium and long line and their model representations - Nominal-T, Nominal-Pie and A, B, C, D Constants for Short, medium, symmetrical & Asymmetrical Networks, Numerical Problems. Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems.

PERFORMANCE OF LONG TRANSMISSION LINES

Long Transmission Line - Rigorous Solution, evaluation of A,B,C,D Constants, Interpretation of the Long Line Equations, Incident, Reflected and Refracted Waves -Surge Impedance and SIL of Long Lines, Wave Length and Velocity of Propagation of Waves - Representation of Long Lines - Equivalent-T and Equivalent Pie network models (numerical problems).

UNIT-III: POWER SYSTEM TRANSIENTS

Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems), Bewley's Lattice Diagrams, Attenuation and distortion of Travelling Waves.

VARIOUS FACTORS GOVERNING THE PERFORMANCE OF TRANSMISSION LINE

Skin and Proximity effects - Description and effect on Resistance of Solid Conductors - Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

UNIT-IV: OVERHEAD LINE INSULATORS

Types of Insulators, String efficiency and Methods for improvement, Numerical Problems - voltage distribution, calculation of string efficiency, Capacitance grading and Static Shielding.

SAG AND TENSION CALCULATIONS

Sag and Tension Calculations with equal and unequal heights of towers, Effect of Wind and Ice on weight of Conductor, Numerical Problems - Stringing chart and sag template and its applications.

UNIT-V: UNDERGROUND CABLES

Types of Cables, Construction, Types of Insulating materials, Calculation of Insulation resistance and stress in insulation, Numerical Problems. Capacitance of Single and 3-Core belted cables, Numerical

Problems. Grading of Cables - Capacitance grading, Numerical Problems, Description of Inter-sheath grading, HV cables.

Text Books:

1. C.L. Wadhwa, Electrical power systems - New Age International (P) Limited, Publishers,1998.
2. I.J. Nagarath& D.P Kothari , Power System Engineering, TMH 2/e, 2010
3. Power System Engineering- by R.K.Rajput Laxmi Publications(P) Limited, New Delhi 2006.
4. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill.

Reference Books:

1. B.R. Gupta, Power System Analysis and Design, Wheeler Publishing.
2. AbhijitChakrpabarti, SunithaHalder, Power System Analysis, Operation and control, PHI, 3/e, 2010
3. TuranGonen, Electrical Power Transmission system engineering Analysis and design, CRC Press (Taylor & Francis Group) Special Indian Edition, 2/e.
4. M.L. Soni, P.V. Gupta, U.S. Bhatnagar, A. Chakrabarthy, Power System Engineering, Dhanpat Rai & Co Pvt. Ltd.

Course Outcomes:

After going through this course the student gets a thorough knowledge

- On calculation of transmission line parameters, analysis of short, medium, long length lines and the factors effecting the performance of transmission lines, transients in transmission lines.
- Operation of different types of overhead line insulators, sag and tension calculation of transmission lines and brief study and calculation of underground cables for power transmission as well for distribution.
- With this subject which he/she can be able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95202) CONTROL SYSTEMS

III Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:

In this course it is aimed to introduce to

- The students the principles and applications of control systems in everyday life.
- The basic concepts of block diagram reduction,
- Time domain analysis solutions to time invariant systems.
- Deals with the different aspects of stability analysis of systems in frequency domain and time domain.
- Concept on multi input and multi output systems.

UNIT-I: INTRODUCTION:

Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems.

TRANSFER FUNCTION REPRESENTATION:

Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

UNIT-II: TIME RESPONSE ANALYSIS:

Standard test signals - Time response of first order systems – Characteristic Equation of Feedback control systems, Transient response of second order systems - Time domain specifications – Steady state response - Steady state errors and error constants – Effects of proportional derivative, proportional integral systems.

UNIT-III: STABILITY ANALYSIS:

The concept of stability – Routh- Hurwitz stability criterion – Absolute stability and conditional stability.

Root Locus Technique:

The root locus concept - construction of root loci-effects of adding poles and zeros to G(s) H(s) on the root loci.

Frequency Response Analysis:

Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT-IV: STABILITY ANALYSIS IN FREQUENCY DOMAIN:

Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability –Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams.

Classical Control Design Techniques:
Compensation techniques – Lag, Lead, and Lead-Lag Controllers design in frequency Domain, PID Controllers- Numerical Problems.

UNIT-V: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS:
Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization - Solving the Time invariant state Equations- State Transition Matrix and its Properties. Concepts on Controllability and Observability

Text Books:

1. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
2. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and sons.
3. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

Reference Books:

1. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
2. Control Systems Engg. by NISE 3rd Edition – John wiley
3. Control Systems by S.Kesavan, Hitech Publications.
4. "Modeling & Control of Dynamic Systems" by Narciso F. Macia George J. Thaler, Thomson Publishers.
5. Solutions and Problems of Control Systems by A.K.Jairath, CBS Publictions,1992.

Course Outcomes:

After going through this course, the student gets knowledge on

- Open loop and closed loop systems, concept of feedback in control systems,
- Mathematical modeling and transfer function derivations of translational and rotational systems
- Transfer functions of servomotors and concepts of synchros.
- Transfer function representation through block diagram algebra and signal flow graphs,
- Time response analysis of different ordered systems through their characteristic equation and time-domain specifications
- Stability analysis of control systems in s-domain through R-H criteria and root-locus techniques
- Frequency response analysis through bode diagrams

With which he/she can be able to apply the above conceptual things to real world electrical and Electronic problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95203) POWER ELECTRONICS

III Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:

- With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization.
- This course introduces the basic concepts of power semiconductor devices, converters and choppers and their analysis.

UNIT-I: POWER SEMI CONDUCTOR DEVICES AND COMMUTATION CIRCUITS

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and Turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points.
Two transistor analogy of SCR – R,RC,UJT firing circuits– Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT-II: SINGLE PHASE HALF WAVE CONTROLLED CONVERTERS

Phase control technique – Single phase Line commutated converters – Half wave controlled converters with Resistive, RL load and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Free wheeling Diode –Numerical problems

SINGLE PHASE FULLY CONTROLLED CONVERTERS:

Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters , semi-converters, active and Reactive power inputs to the converters , Effect of source inductance – Expressions of load voltage and current – Numerical problems.

UNIT-III: THREE PHASE LINE COMMUTATED CONVERTERS:

Three phase converters – Three pulse and six pulse converters and bridge connections with R, RL load voltage and current with R and RL load and RLE loads – Semi Converters, Effect of Source inductance–Dual converters Waveforms –Numerical Problems.

UNIT-IV: AC VOLTAGE CONTROLLERS and CYCLO CONVERTERS

AC voltage controllers – Single phase two SCR's in anti parallel with R and RL loads , modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor- wave forms , Numerical problems.
CYCLO CONVERTERS: Single phase Mid point cyclo converters with resistive and inductive loads, Bridge Configuration of cyclo converters- Waveforms.

UNIT-V: CHOPPERS & INVERTERS

Choppers – Time ratio control and Current limit control strategies – Step down choppers- Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression and Problems.

Inverters – Single phase inverter – Waveforms, Three Phase Inverters (180,120 degrees modes of operation), Voltage control techniques for inverters- Pulse width modulation techniques – Numerical problems.

Text Books:

1. P.S.Bhimbra , "Power Electronics ", Khanna publications.
2. M. H. Rashid, Power Electronics : Circuits, Devices and Applications,– Prentice Hall of India, 2nd edition, 1998.
3. Power electronics: converters, applications, and design By Ned Mohan, Tore M. Undeland, John Wiley & Sons,2009.

Reference Books:

1. Power Electronics, Vedam Subramanyam, New Age International (P) Limited, Publishers.
2. Elements of Power Electronics, Philip T. Krein, Oxford University Press.
3. Power Electronics, M. S. Jamil Asghar, PHI Private Limited.
4. Power Electronics, P.C.Sen,Tata Mc Graw-Hill Publishing.

Course Outcomes:

- After going through this course the student gets a thorough knowledge on construction operation V-I characteristics commutation firing and protection of various power semiconductor devices.
- Focused analysis of thyristor devices nature of the R, R-L, and R-L-E Loads for different power inputs.
- AC-DC power conversion through single phase and three phase controlled rectifiers.
- DC-AC power conversion through step and step down coppers.
- AC-AC power conversion through AC Voltage controllers, frequency conversion through Cyclo converters.
- DC-AC power conversion through single phase and three phase Inverters, different types of PWM techniques, steady state and transient state analysis of all the power converters with which he/she can be able to apply the above conceptual things to real world Electrical and Electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95407)LINEAR & DIGITAL IC APPLICATIONS

III Year B.Tech. EEE I-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To introduce the basic building blocks of linear integrated circuits.
- To teach the linear and non-linear applications of operational amplifiers.
- To introduce the theory and applications of analog multipliers and PLL.
- To teach the theory of ADC and DAC.
- To introduce the concepts of waveform generation and introduce some special function ICs.
- To understand and implement the working of basic digital circuits.

UNIT-I: INTEGRATED CIRCUITS

Classification, , idea and practical Op-amp, internal circuits, Op-amp characteristics, DC and AC characteristics, 741 op-amp and its features, modes of operation-inverting, non-inverting, differential. Basic application of OP-amp, instrumentation amplifier, ac amplifier, V to I and I to V converters, sample & hold circuits, Differentiators and Integrators, Comparators, Schmitt trigger, Multivibrators, introduction to voltage regulators, features of 723.

UNIT-II: ACTIVEFILTERS & OSCILLATORS

Introduction, its order LPF,HPF filters. Band pass, Band reject and all pass filters. Oscillator types and principle of operation – RC, Wine and quadrature type, waveform generators – triangular, saw tooth, square wave and VCO.

UNIT-III: TIMERS & PHASELOCKED LOOPS

Introduction to 555 timer, functional diagram, monostable and astable operations and applications, Schmitt Trigger. PLL – introduction, block schematic, principles and description of individual block of 565.

D-A AND A-D CONVERTERS :Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs – parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC specifications.

UNIT-IV: COMBINATIONAL CIRCUITS

Introduction to integrated circuits: integrated circuit definition, classification, development of IC's, logic families: RTL, DTL, TTL, ECL, I^2L and CMOS – analysis

Design using TTL-74XX & CMOS 40XX series, code converters, decoders, Demultiplexers, Encoder, priority Encoder, multiplexers & their applications, priority generators circuits. arithmetic circuits-parallel binary adder/subractor circuits using 2's, Complement system. Digital comparator circuits.

UNIT-V: SEQUENTIAL CIRCUITS

Flip-flops & their conversions. Synchronous and asynchronous counters. Decade counter, shift registers & applications, familiarities with commonly available 74XX & CMOS 40XX series of IC counters.

Text Books:

1. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.
2. Digital Fundamentals – Floyd and Jain, Person Education, 8th Edition, 2005.

References:

1. Op Amps & linear integrated circuits – concepts and applications James M.Fiore cengage learning 2009.
2. Op Amps and Linear ICs Ramakanth A Gayakwad PHI 1987.
3. Operational Amplifiers and Linear Integrated Circuits: 4/e William D Stanley PEI 2009.
4. Operational Amplifiers and Linear Integrated Circuits K Lal kishore person 2008. Modern Digital digital Electronics RP Jain 4/e TMH 2010.

Course Outcomes:

On completion of this course, the students will have:

- A thorough understanding of operational amplifiers with linear integrated circuits.
- Understanding of the different families of digital integrated circuits and their characteristics.
- Also students will be able to design circuits using operational amplifiers for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95204) ELECTRICAL MACHINES-III

III Year B.Tech. EEE I-Sem **L T P C**
4 0 0 4

Course Objectives:

- It deals with the detailed analysis of Synchronous Generators and Motors which are prime source of Electrical power generation and utilities.
- Also covers different types of single phase motors which are having significant applications in house hold appliances and control systems.

UNIT-I: Construction and Principle of operation of synchronous machine:
Constructional features of round rotor and salient pole machines, Armature windings: Integral slot and fractional slot windings; Distributed and concentrated windings Distribution Pitch and windings factors, E.M.F Equation.
Harmonics ingenerated E.M.F. Superposition of harmonics, Armature reaction, Leakage reactance, Synchronous reactance and impedance, Experimental determination, Phasor diagram, Load characteristics.

UNIT-II: Regulation of Synchronous generator:
Regulation by synchronous impedance method, MMF. Method, Z.P.F. method and A.S.A methods, Salient pole alternators. Two reaction analysis, Experimental determination of X_d and X_q (Slip test) Phasor diagrams, Regulation of salient pole alternators.

UNIT-III: Parallel operation of Synchronous generators:
Synchronizing alternators with infinite bus bars, Synchronizing power torque, Parallel operation and load sharing, Effect of change of excitation and mechanical power input, Analysis of short circuit current wave form, Determination of sub-transient, Transient and steady state reactances.

UNIT-IV: Synchronous motors- principle of operation:
Theory of operation, Phasor diagram, Variation of current and power factor with excitation synchronous condenser, Mathematical analysis for power developed
Power circles: Excitation and power circles - Hunting and its suppression, Methods of starting, synchronous induction motor.

UNIT-V: Single phase motors Special machines:
Single phase Motors: Single phase induction motor- Constructional features Double revolving field theory, Cross Field theory Equivalent Circuit - Spilt phase motors – Capacitor start Capacitor run motors, shaded pole motor. Principle of A.C. Series motor-Universal motor, Stepper motor, PMDC and Reluctance Motor. (Qualitative Treatment only).

Text Books:

1. Electrical Machines – by P.S. Bimbra, Khanna Publishers.
2. Electric Machines- by I.J. Nagrath & D.P. Kothari, Tata Mc Graw-Hill Publishers, 3rd Edition 2006.

Reference Books:

1. Performance and Design of AC Machines, MG. Say, BPB Publishers
2. Electrical Machines by Mulukutla S.Sarma, Mukesh K. Pathak, Cengage Learning, 2009.
3. Electric Machinery – by A.E. Fitzgerald, C.Kingsley and S.Umans,Mc Graw-Hill Companies, 5th edition, 1990.

Course Outcomes:

- After going through this course the student gets a thorough knowledge on, construction operation characteristics regulation parallel-operation power circle starting & speed control methods of synchronous machines.
- Construction operation characteristics of single-phase motor and special machines, with which he/she can be able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95208) ELECTRICAL MEASUREMENTS LAB

III Year B.Tech. EEE I-Sem

L	T	P	C
0	0	3	2

Course Objectives:

- This course introduces the basic principle of all measuring instruments.
- It also deals with the measurement of RLC parameters
- It also deals with the measurement voltage, current, power, power factor and energy.

List of Experiments:

1. Calibration and Testing of single phase energy Meter.
2. Calibration of dynamometer power factor meter.
3. Crompton D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter.
4. Kelvin's double Bridge – Measurement of resistance – Determination of Tolerance.
5. Dielectric oil testing using H.T. testing Kit.
6. Schering bridge & Anderson bridge.
7. Measurement of 3-Phase reactive power with single-phase wattmeter.
8. Measurement of parameters of a choke coil using 3-voltmeter an 3-ammeter methods.
9. Calibration LPF wattmeter – by Phantom testing.
10. Measurement of 3-phase power with single watt meter and 2 No's of C.T.
11. Resistance strain gauge – strain measurements and Calibration.
12. Transformer turns ratio measurement using a.c.bridge.
13. Measurement of % ratio error and phase angle of given C.T. by comparison.
14. LVDT and capacitance pickup- characteristics and calibration.

Note: Minimum 12 Experiments to be conducted

Course outcomes:

- Compare performance of MC, MI and Dynamometer types of measuring instruments, Energy meters and CRO.
- Determine the circuit parameters using AC and DC bridges.
- Compute the errors in CTs and PTs.
- Select transducers for the measurement of temperature, displacement and strain.
- Understand operating principles of electronic measuring instruments.
- Understand the performance of industrial instruments.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95209) ELECTRICAL MACHINES – II LAB

III Year B.Tech. EEE I-Sem

L	T	P	C
0	0	3	2

Course Objectives:

- To introduces concept of rotating machines and principle of the Electro mechanical energy conversion
- To understand functioning of different types of dc machines.
- To estimate losses and estimation of various dc machines.

List of Experiments:

1. OC & SC tests on single phase transformer.
2. Sumpner's test on a pair of single phase transformers.
3. Brake test on three phase induction motor.
4. No load & blocked rotor tests on three phase induction motor.
5. Regulation of three phase alternator by synchronous impedance and mmf methods.
6. 'v' & inverted 'v' curves of a three phase synchronous motor.
7. Equivalent circuit of a single phase induction motor.
8. Determination of xd & xq of a salient pole synchronous machine.
9. Separation of core losses of a single phase transformer.
10. Scott connection of transformers.
11. Regulation of three-phase alternator by Z.P.F. and A.S.A methods.
12. Efficiency of a three phase alternator.

Course Outcomes:

- Select range of apparatus based on the ratings of DC Machines.
- Determine Characteristics of DC machines by conducting tests.
- Evaluate the efficiency of the machine by analyzing test results.
- Study speed control methods for dc machines
- Select range of apparatus based on the ratings of DC Machines

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A95002) ADVANCED ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB

III Year B.Tech. I-Sem

L	T	P	C
0	0	3	2

Introduction:

The introduction of the English Language Communication Skills Lab is considered essential at 3rd year level. At this stage, the students need to prepare themselves for their careers which may require them to listen to, read, speak and write in English both for their professional and interpersonal communication in the globalised context.

The proposed course should be a laboratory course to enable students to use 'good' English and perform the following:

- Gathering ideas and information to organize ideas relevantly and coherently.
- Engaging in debates.
- Participating in group discussions.
- Facing interviews.
- Writing project/research reports/technical reports.
- Making oral presentations.
- Writing formal letters.
- Transferring information from non-verbal to verbal texts and vice-versa.
- Taking part in social and professional communication.

Course Objectives:

This Lab focuses on using multi-media instruction for language development to meet the following targets:

- To improve the students' fluency in English, through a well-developed vocabulary and enable them to listen to English spoken at normal conversational speed by educated English speakers and respond appropriately in different socio-cultural and professional contexts.
- Further, they would be required to communicate their ideas relevantly and coherently in writing.
- To prepare all the students for their placements.

Syllabus:

The following course content to conduct the activities is prescribed for the Technical Communication Skills (TCS) Lab:

1. **Fundamentals of Inter-personal Communication and Building Vocabulary** - Starting a conversation – responding appropriately and relevantly – using the right body language – Role Play in different situations and Discourse Skills- using visuals - Synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, business vocabulary, analogy, idioms and phrases, collocations and usage of vocabulary.
2. **Reading Comprehension** –General Vs Local comprehension, reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading & effective googling.
3. **Writing Skills** – Structure and presentation of different types of writing – *letter writing/Resume writing/ e-correspondence/ Technical report writing/ Portfolio writing* – planning for writing – improving one's writing.

4. **Presentation Skills** – Oral presentations (individual and group) through JAM sessions/seminars/**PPTs** and written presentations through posters/projects/reports/ e-mails/assignments etc.
5. **Group Discussion and Interview Skills** – Dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and organization of ideas and rubrics for evaluation- Concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele-conference and video-conference and Mock Interviews.

4. Minimum Requirement:

The Technical Communication Skills (TCS) Laboratory shall have the following infra-structural facilities to accommodate at least 35 students in the lab:

- Spacious room with appropriate acoustics
- Round Tables with movable chairs
- Audio-visual aids
- LCD Projector
- Public Address system
- P – IV Processor, Hard Disk – 80 GB, RAM–512 MB Minimum, Speed – 2.8 GHZ
- T. V, a digital stereo & Camcorder
- Headphones of High quality

5. Prescribed Lab Manual: A book titled *A Course Book of Advanced Communication Skills (ACS) Lab* published by Universities Press, Hyderabad.

6. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

- Oxford Advanced Learner's Compass, 8th Edition
- DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.
- Lingua TOEFL CBT Insider, by Dreamtech
- TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- The following software from 'train2success.com'
  - Preparing for being Interviewed
  - Positive Thinking
  - Interviewing Skills
  - Telephone Skills
  - Time Management
  - Skillmate
  - Presentation skills, Cambridge (with VCD)

Books Prescribed:

1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press 2009.
2. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai 2008.
3. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education 2011.

4. Technical Communication by Paul V. Anderson. 2007. Cengage Learning pvt. Ltd. New Delhi.
5. Business and Professional Communication: Keys for Workplace Excellence. Kelly M. Quintanilla & Shawn T. Wahl. Sage South Asia Edition. Sage Publications. 2011.

Suggested Books:

1. The Basics of Communication: A Relational Perspective. Steve Duck & David T. McMahan. Sage South Asia Edition. Sage Publications. 2012.
2. English Vocabulary in Use series, Cambridge University Press 2008.
3. Management Shapers Series by Universities Press(India)Pvt Ltd., Himayatnagar, Hyderabad 2008.
4. Handbook for Technical Communication by David A. McMurrey & Joanne Buckley. 2012. Cengage Learning.
5. Communication Skills by Leena Sen, PHI Learning Pvt Ltd., New Delhi, 2009.
6. Handbook for Technical Writing by David A McMurrey & Joanne Buckely CENGAGE Learning 2008.
7. Job Hunting by Colm Downes, Cambridge University Press 2008.
8. Master Public Speaking by Anne Nicholls, JAICO Publishing House, 2006.
9. English for Technical Communication for Engineering Students, Aysha Vishwamohan, Tata Mc Graw-Hil 2009.
10. Books on TOEFL/GRE/GMAT/CAT/ IELTS by Barron's/DELTA/Cambridge University Press.
11. International English for Call Centres by Barry Tomalin and Suhashini Thomas, Macmillan Publishers, 2009.
12. Towards Career Advancement - Excerpts from a Professor's Folio by P.Satyanarayana Prof. of English, Vaagdevi College of Engineering , published by Vaagdevi Group of Colleges Engineering , Warangal (T.S.) India, 2015.

Course Outcomes

- Developing sound vocabulary and its proper use contextually.
- Inculcating flair for Writing and felicity in written expression.
- Enhancing job prospects.
- Acquiring effective speaking abilities

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96201) SWITCH GEAR AND PROTECTION

III Year B.Tech. EEE II-Sem

L	T	P	C
4	1	0	4

Course Objective: This course introduces

- All varieties of Circuit Breakers and Relays for protection of Generators, Transformers and feeder bus bars from over voltages and other hazards.
- It emphasis on Neutral for overall protection.

UNIT-I: INTRODUCTION TO CIRCUIT BREAKERS

Circuit Breakers: Elementary principles of arc interruption, Arc Phenomena, Restriking Voltage and Recovery voltages. - Restriking Phenomenon, Average and Max. RRRV, Numerical Problems - Current Chopping and Resistance Switching - CB ratings and Specifications: Types and Numerical Problems. – Auto reclosures. Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit-breakers.

UNIT-II: ELECTROMAGNETIC AND STATIC RELAYS

Principle of Operation and Construction of Attracted armature, Balanced Beam, induction Disc and Induction Cup relays. Types of Over Current Relays: Instantaneous, DMT and IDMT types. Application of relays: Over current/ under voltage relays, Direction relays, Differential Relays and Percentage Differential Relays.Universal torque equation, Distance relays: Impedance, Reactance and Mho and Off-Set Mho relays, Characteristics of Distance Relays and Comparison. Static Relays: Static Relays verses Electromagnetic Relays. Introduction to Numerical Relays.

UNIT-III: PROTECTION OF POWER EQUIPMENT

Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection. Numerical Problems on % Winding Unprotected. Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholtz relay Protection.Protection of Lines: Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay.
Protection of Bus bars – Differential protection.

UNIT-IV: NEUTRAL GROUNDING

Grounded and Ungrounded Neutral Systems:- Effects of Ungrounded Neutral on system performance, Arcing Grounds Methods of Neutral Grounding: Solid, Resistance, Reactance – Peterson Coil, voltage Transformer Earthing and Grounding Practices, Grounding Transformers (Star-Delta and Zig-Zag).

UNIT-V: PROTECTION AGAINST OVERVOLTAGES

Generation of Over Voltages in Power Systems.-Protection against Lightning Over Voltages - Valve type and Zinc-Oxide Lighting Arresters - Insulation Coordination -BIL, Impulse Ratio, Standard Impulse Test Wave, Volt-Time Characteristics.

Text Books:

1. Badri Ram, D.N Viswakarma, Power System Protection and Switchgear, TMH Publications. 2nd editon
2. Sunil S Rao, Switchgear and Protection – Khanna Publlishers.
3. C.L.Wadhwa, Electrical Power Systems –New Age international (P) Limited, Publishers, 3rd editon.

Reference Books:

1. Paithankar and S.R.Bhide, Fundamentals of Power System Protection, PHI, 2003.
2. C R Mason, Art & Science of Protective Relaying – Wiley Eastern Ltd.
3. B.L.Soni, Gupta, Bhatnagar, Chakrabarthy, A Text book on Power System Engineering, Dhanpat Rai & Co.

Course Outcomes:

- Students are knowledgeable in the field of power system protection, and circuit breakers.
- Students are knowledgeable in the field of instrument transformers, the field of relays.
- Students will demonstrate and ability to design the relevant protection systems for the main elements of a power system
- Students are knowledgeable in the field of switchgear
- Students are knowledgeable in the field of over- voltage protection and the basics of data transmission.
- Students will demonstrate an ability to participate in professional multidisciplinary teams.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96202) POWER SEMICONDUCTOR DRIVES

III Year B.Tech. EEE II-Sem

L	T	P	C
4	1	0	4

Course Objectives:

- This course is an extension of Power Electronics application to AC and DC drives.
- Control of DC, Motor drives with 1 phase and 3 phase converters are given in detail.
- Control of AC, Motor drives with variable frequency converters and variable voltage are presented for both stator and rotor side.
- Different type of breakings is given in detail.

UNIT-I: Control of DC motors by Single phase Converters

Introduction to Thyristor controlled Drives, Single Phase semi and Fully controlled converters connected to d.c separately excited and d.c series motors – continuous current operation – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque Characteristics- Problems on Converter fed d.c motors.

Control of DC motors by Three phase Converters

Three phase semi and fully controlled converters connected to d.c separately excited and d.c series motors – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque characteristics – Problems.

Four Quadrant operation of DC Drives

Introduction to Four quadrant operation – Motoring operations, Electric Braking – Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by dual converters – Closed loop operation of DC motor (Block Diagram Only)

UNIT-II: Control of DC motors by Choppers

Single quadrant, Two –quadrant and four quadrant chopper fed dc separately excited and series excited motors – Continuos current operation – Output voltage and current wave forms – Speed torque expressions – speed torque characteristics – Problems on Chopper fed d.c Motors – Closed Loop operation (Block Diagram Only)

UNIT-III: Control of Induction Motor through Stator voltage

Variable voltage characteristics-Control of Induction Motor by Ac Voltage Controllers – Waveforms – speed torque characteristics.

Control of Induction Motor through Stator Frequency

Variable frequency characteristics-Variable frequency and v/f control of induction motor by Voltage source,current source inverter and cycloconverters, PWM control – Comparison of VSI and CSI operations – Speed torque characteristics – numerical problems on induction motor drives – Closed loop operation of induction motor drives (Block Diagram Only)

UNIT-IV: Control of Induction motor of Rotor side

Static rotor resistance control – Slip power recovery – Static Scherbius drive – Static Kramer Drive – their performance and speed torque characteristics – advantages applications – problems

UNIT-V: Control of Synchronous Motors

Separate control & self control of synchronous motors – Operation of self controlled synchronous motors by VSI and CSI cycloconverters. Load commutated CSI fed Synchronous Motor – Operation – Waveforms – speed torque characteristics – Applications – Advantages and Numerical Problems – Closed Loop control operation of synchronous motor drives (Block Diagram Only), variable frequency control, Cyclo converter, PWM, VFI, CSI.

Text Books:

1. Fundamentals of Electric Drives – by G K Dubey Narosa Publications
2. Power Electronic Circuits, Devices and applications by M.H.Rashid, PHI.
3. Electronic motor drives modeling Analysis and control –R. Krishnan –I Edition Prentice Hall India

Reference Books:

1. Power Electronics – MD Singh and K B Khanchandani, Tata – McGraw-Hill Publishing company,1998
2. Modern Power Electronics and AC Drives by B.K.Bose, PHI.
3. Thyristor Control of Electric drives – Vedam Subramanyam Tata McGraw Hill Publilcations.
4. A First course on Electrical Drives – S K Pillai New Age International(P) Ltd. 2nd Editon.

Course Out comes:

- Students will get technical knowledge of various control techniques involved in machines.
- Ability to work in Industries related to drives.
- Ability to apply technical knowledge in Electric Traction and application involved in motion control.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96621) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

III Year B.Tech EEE II Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To enable the student to understand and appreciate, with a practical insight, the importance of certain basic issues governing the business operations namely.
- Demand and supply, production function, cost analysis, markets forms of business organizations, capital budgeting and financial accounting and financial analysis by using ratios.

UNIT-I

Introduction to Managerial Economics: Definition, Nature and Scope of Managerial Economics Demand Analysis: Demand Determinants, Law of Demand and its exceptions, Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

UNIT-II

Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Production function, Laws of Returns, Internal and External Economies of Scale. Cost Analysis: Cost concepts, Opportunity cost, Fixed Vs. Variable costs, Explicit costs Vs.Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

UNIT-III

Introduction to Markets & Pricing strategies: Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies, Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

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 finance, Nature and scope of capital budgeting, features of capital budgeting proposals, methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

UNIT- V

Introduction to Financial Accounting & Financial Analysis: Double-Entry Book Keeping, Journal, Ledger, Trial Balance – Final Account (Trading Account, Profit and Loss Account

and Balance Sheet with simple adjustments.) Computation, Analysis and Interpretation of Liquidity Ratios (Current Ration and quick ratio), Activity Ratios (Debt-Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

Text Books

Aryasri: Managerial Economics and Financial Analysis, 2/e, TMH, 2005.
Varshney & Maheswari: Managerial Economics, Sultan Chand, 2003.

References

1) Ambrish Gupta,Financial Accounting for Management, Pearson Education, New Delhi, 2004.
2) Shim & Siegel: Financial Accounting (Schaum's Outlines), 2/e TMH, 2004
3) Chary: Production and Operations Management, 3/e, TMH, 2004.
4) Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2003.
5) Narayanaswamy: Financial Accounting-A Managerial Perspective, PHI, 2005.
6) Peterson & Lewis: Managerial Economics, 4th Edition, Pearson Education, 2004.
7) Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2005.
8) S.N.Maheswari & S.K. Maheswarial, Financial Accounting, Vikas, 2005.
9) Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2004.
10) Dwivedi: Managerial Economics, 6th Ed., Vikas, 2002.
11) Yogesh Maheswari: Managerial Economics, 2nd Ed., PHI, 2005

Course Outcomes:

- To study fundamental concepts in managerial economics and financial analysis including certain basic issues governing the business operations.
- To learn the concepts of demand, elasticity of demand and demand forecasting and methods of demand forecasting.
- To learn various issues involved in production decision analysis.
- To gain the knowledge of Break – Even Analysis and its importance in managerial decision making.
- To learn different types of market environment under various types of competition.
- To gain the knowledge of new economic environment in post – liberalization scenario.
- To know the concepts of capital budgeting and various methods of capital budgeting and its application in business decision making.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96105) DISASTER MANAGEMENT
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

Student will be able to

- Understand the difference between a hazard and disaster
- Know about various disasters and their impacts
- Understand different approaches of disaster risk reduction
- Understand disaster risks in India

UNIT 1: Understanding Disaster

1. Concept of Disaster
2. Different approaches
3. Concept of Risk
4. Levels of Disasters
5. Disaster Phenomena and Events (Global, national and regional)

Hazards and Vulnerability

1. Natural and man-made hazards; response time, frequency and forewarning levels of different hazards.
2. Characteristics and damage potential or natural hazards; hazard assessment.
3. Dimensions of vulnerability factors; vulnerability assessment.
4. Vulnerability and disaster risk.
5. Vulnerabilities to flood and earthquake hazards.

UNIT 2 : Disaster Management Mechanism

1. Concepts of risk management and crisis managements.
2. Disaster Management Cycle.
3. Response and Recovery.
4. Development, Prevention, Mitigation and Preparedness.
5. Planning for Relief.

UNIT 3: Capacity Building

1. Capacity Building: Concept.
2. Structural and Nonstructural Measures.
3. Capacity Assessment; Strengthening Capacity for Reducing Risk.
4. Counter-Disaster Resources and their utility in Disaster Management.
5. Legislative Support at the state and national levels.

UNIT 4: Coping with Disaster

1. Coping Strategies; alternative adjustment processes.
2. Changing Concepts of disaster management.
3. Industrial Safety Plan; Safety norms and survival kits.
4. Mass media and disaster management.

UNIT 5: Planning for disaster management

1. Strategies for disaster management planning.
2. Steps for formulating a disaster risk reduction plan.
3. Disaster management Act and Policy in India.
4. Organizational structure for disaster management in India.
5. Preparation of state and district disaster management plans.

Text Books

1. Alexander, D. Natural Disasters, ULC press Ltd, London, 1993.
2. Carter, W.N. Disaster Management: A Disaster Management Handbook, Asian Development Bank, Bangkok, 1991.
3. Manual on Natural Disaster Management in India, NCDM, New Delhi, 2001.

References

1. Abarquez I. & Murshed Z. Community Based Disaster Risk Management: Field Practitioner's Handbook, ADPC, Bangkok, 2004.
2. Goudie, A. Geomorphological Techniques, Unwin Hyman, London 1990.
3. Goswami, S.C Remote Sensing Application in North East India, Purbanchal Prakesh, Guwahati, 1997.
4. Chakrabarty, U.K. Industrial Disaster Management and Emergency Response, Asian Book Pvt. Ltd., New Delhi 2007.
5. Disaster Management in India, Ministry of Home Affairs, Government of India, New Delhi, 2011.
6. National Policy on Disaster Management, NDMA, New Delhi, 2009
7. Disaster Management Act. (2005), Ministry of Home Affairs, Government of India, New Delhi, 2005.
8. District Disaster Management Plan-Model Template, NIDM, New Delhi, 2005.
9. Disaster Management, Future challenge and opportunities, Edited by Jagbir singh, I.K. International publishing home Pvt, Ltd.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of disaster Management
- Understand the vulnerability of ecosystem and infrastructure due to a disaster
- Acquire the knowledge of Disaster Management Phases
- Understand the hazard and vulnerability profile of India

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96106) AIR POLLUTION AND CONTROL
(OPEN ELECTIVE)

III B.Tech. II Sem

L	T	P	C
4	0	0	4

Course Objectives:

Student will be able to

- Develop an understanding of Air pollution Concepts.
- Develop an understanding of Effects of air pollution.
- Develop an understanding of Air pollution Control devices.
- Develop an understanding of Air quality monitoring devices.

UNIT-I

Air Pollution-Definitions, Scope, Significance and Episodes, Air Pollutants-Classifications-Natural and Artificial-Primary and Secondary, point and Non-Point, Line and Areal Sources of air pollution- stationary and mobile sources.

UNIT-II

Effects of Airpollutants on man, material and vegetation; Global effects of air pollution – Green House effect, Heat Islands, Acid Rains, Ozone Holes etc.

UNIT-III

Thermodynamics and Kinetics of Air-pollution – Applications in the removal of gases like SO_x; NO_x; CO; HC etc., air-fuel ratio. Computation and Control of products of combustion.
Meteorology and plume Dispersion; properties of atmosphere; Heat, Pressure, Wind forces, Moisture and relative Humidity; Influence of Meteorological phenomena on Air Quality-wind rose diagrams.

UNIT-IV

Lapse Rates, Pressure Systems, Winds and moisture plume behaviour and plume Rise Models; Gaussian Model for Plume Dispersion.
Control of particulates – Control at Sources, Process Changes, Equipment modifications, Design and operation of control.
Equipment's – Settling Chambers, Centrifugal separators, filters Dry and Wet scrubbers, Electrostatic precipitators.

UNIT-V

General Methods of Control of NO_x and SO_x emissions – In-plant Control Measures, process changes, dry and wet methods of removal and recycling.
Air Quality Management – Monitoring of SPM, SO_x; NO_x and CO Emission Standards.

Text books:

1. Air pollution by M.N.Rao and H.V.N.Rao – Tata Mc.Graw Hill Company.
2. Air pollution by Wark and Warner.- Harper & Row, New York.

Reference:

1. Air Pollution and Control Engineering by Noel de Nevers, McGraw Hill, 2000.
2. Environmental Pollution Control Engineering by Rao C.S, Wiley Eastern Limited, India, 1993.
3. Air pollution and control By K.V.S.G. Murali Krishna, Kaushal Publishers. Kakinada.

Course Outcomes:

After completion of this course, student should be able to

- Acquire the knowledge of Air pollution Concepts.
- Acquire the knowledge of Effects of air pollution.
- Acquire the knowledge of Air pollution Control devices.
- Acquire the knowledge of Air quality monitoring devices.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96203) RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

To make the student

- Introduce to the technology of renewable sources of energy
- Learn about the solar radiation, its applications and radiation measuring instruments
- Learn about the various types of geothermal resources and its applications
- Study the biomass energy resources , bio-mass systems
- Learn the methods of energy extraction from the wind and oceans
- Learn to the technology of direct energy conversion methods

UNIT-I

PRINCIPLES OF SOLAR RADIATION: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on titled surface, instruments for measuring solar radiation and sun shine, solar radiation data for India.

UNIT-II

SOLAR ENERGY COLLECTION: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors, tracking CPC and solar swing

SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion, applications of PV system-PV hybrid systems

UNIT-III

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria, analysis of aerodynamic forces acting on blade, applications.

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects, biomass resource development in India.

UNIT-IV

GEOTHERMAL ENERGY: Structure of earth's interior- geothermal sites- earthquakes & volcanoes- geothermal resources- hot springs-steam ejection- principle of working- types of geothermal station with schematic representation site selection for geothermal power plants-problems associated with geothermal conversion-applications-geothermal energy prospects in India.

OCEAN ENERGY: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT-V

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

Text Books:

1. Non-Conventional Energy Sources by G.D. Rai, Khanna Publihers, fourth edition, 2008

Reference Books:

1. Suhas.P.Sukhatma and Nayak.J.K., "solar Eenergy", TMH, New Delhi, 3rd edition, 2008
2. D.P.Kothari and Rakesh Ranjan and K.C. Singal., " Renewable energy resources and emerging technologies"Prentice Hall of India Pvt.Ltd., 2nd Edition, 2011
3. Non-Conventional Energy Systems / K Mittal /Wheeler

Course Outcomes:

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

- Apply the technology to capture the energy from the renewable Sources like sun, wind, ocean, biomass, geothermal.
- use different renewable energy sources to produce electrical power
- minimize the use of conventional energy sources to produce electrical energy
- identify the fact that the conventional energy resources are depleted

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96204) ENERGY STORAGE SYSTEMS
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- Introduce to the technology of energy storage systems
- Learn about the characteristics of electricity and need of ESS in various applications
- Learn about the various types and features of ESS
- Learn about the practical applications of ESS

UNIT-I: ELECTRICAL ENERGY STORAGE TECHNOLOGIES

Characteristics of electricity, Electricity and the roles of EES, High generation cost during peak-demand periods, Need for continuous and flexible supply, Long distance between generation and consumption, Congestion in power grids, Transmission by cable.

UNIT-II: NEEDS FOR ELECTRICAL ENERGY STORAGE

Emerging needs for EES, More renewable energy, less fossil fuel , Smart Grid uses, The roles of electrical energy storage technologies, The roles from the viewpoint of a utility, The roles from the viewpoint of consumers, The roles from the viewpoint of generators of renewable energy.

UNIT-III: FEATURES OF ENERGY STORAGE SYSTEMS

Classification of EES systems , Mechanical storage systems, Pumped hydro storage (PHS), Compressed air energy storage (CAES), Flywheel energy storage (FES),Electrochemical storage systems , Secondary batteries , Flow batteries, Chemical energy storage , Hydrogen (H2),Synthetic natural gas (SNG).

UNIT-IV: TYPES OF ELECTRICAL ENERGY STORAGE SYSTEMS

Electrical storage systems, Double-layer capacitors (DLC) ,Superconducting magnetic energy storage (SMES),Thermal storage systems ,Standards for EES, Technical comparison of EES technologies.

UNIT-V: APPLICATIONS

Present status of applications, Utility use (conventional power generation, grid operation & service) , Consumer use (uninterruptable power supply for large consumers), New trends in applications ,Renewable energy generation, Smart Grid, Smart Micro grid, Smart House, Electric vehicles, Management and control hierarchy of storage systems, Internal configuration of battery storage systems, External connection of EES systems , Aggregating EES systems and distributed generation (Virtual Power Plant), Battery SCADA– aggregation of many dispersed batteries.

TEXT BOOK:

1. ‘’Energy Storage Benefits and Market Analysis’’ by James M. Eyer, Joseph J. Iannucci and Garth P. Corey.The Electrical Energy Storage by IEC Market Strategy Board.

REFERENCE BOOKS:

2. Jim Eyer, Garth Corey: *Energy Storage for the Electricity Grid: Benefits and Market Potential Assessment Guide,*Report, Sandia National Laboratories, Feb 2010.

Course Outcomes:

- Apply the technology to have energy storage system for any electrical Loads
- To save the electrical power in peak time loads using ESS
- To store energy and to avoid the environmental pollution

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96307) NANO TECHNOLOGY
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

1. Understand the fundamentals of Nano theory, necessary background for applications in various industries.
2. Learn the components of Nano materials in detail, and its working in different applications
3. Understand the general scientific concepts required for technology, Apply the concepts in solving engineering problems,
4. Explain scientifically the new developments in engineering and technology, and Get familiarized with the concepts, theories, and technological applications.

Unit-I:

Introduction to nanotechnology: Importance of nanoscale, Nanostructure types, electronic, magnetic, optical Properties of Nanomaterials, top-down and bottom – up approach to nanostructures.

Unit-II:

Quantum Mechanical phenomenon in nanostructures: Quantum confinement of electrons in semiconductor Nano structures, one dimensional confinement (Quantum Wires), two dimensional confinements (Quantum Wells), three dimensional confinements (Quantum dots).

Carbon Nano Structures: Carbon nanotubes (CNTs), Fullerenes, C60, C80 and C240 Nanostructures, properties (mechanical, optical and electrical) and applications.

Unit-III:

Fabrication of Nanomaterials: Physical Methods: Inert gas condensation, Arc discharge, RF plasma, plasma arc technique, lon sputtering, Laser ablation, Laser pyrolysis, Molecular beam eqitaxy, Chemical vapour deposition method.

Unit-IV:

Nano Scale characterization techniques: Scanning probe techniques (AFM, MFM, STM, SEM, TEM), XRD.

Nanodevices and Nanomedicine: Lab on chip for bioanalysis, Core/shell Nanoparticles in drug delivery systems (site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

Unit-V:

Nano and molecular electronics: Resonant-Tunneling Structures, single electron tunneling, Single Electron transistors, coulomb blockade, glant magneto resistance, tunneling magneto resistance.

Nanolithography and nanomanipulation: e-beam lithography and SEM based nanolithography and nanomanipulation, lon beam lithography, oxidation and metallization Mask and its application. Deep UV lithography, x-ray based lithography.

Text Books:

1. Charies.P.pode, introduction to nanotechnology, springer publications.
2. Springer Handbook of Nanotechnology-Bharat Bhusan.
3. Phani Kumar, principles of nanotechnology, scitech publications.

References Books:

1. David Ferry "Transport in Nano structures" Cambridge University press 2000.
2. Nanobiotechnology; ed, C.M.Niemeyer, C.A. Mirkin.
3. Nanofabrication towards biomedical application: Techniques, tools, Application and impact-Ed. Challa S., S.R.Kumar, J.H.Carola.
4. Encyclopedia of Nanotechnology-Hari Singh Nalwa
5. Carbon Nanotubes: Properties and Applications- Michael J.O'Connell.
6. S.Dutta "Electron Transport in Mesoscopic systems" Cambridge University press.
7. H.Grabert and M.Devoret "Single charge Tunneling" Plenum press 1992.

Course Outcomes:

The students will be able to

1. Understand the fundamentals of Nanotechnology
2. Know the different classes of nano materials
3. Impart basic knowledge on various synthesis and characterization techniques involved in Nanotechnology
4. Make the learner familiarize with nanotechnology potentialities.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96413) EMBEDDED SYSTEMS & MICRO PROGRAMMING
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- Ability to understand comprehensively the technologies and techniques underlying in building an embedded solution to a wearable, mobile and portable system.

Unit I: Introduction to Embedded System

Embedded system processor, hardware unit, soft ware embedded into a system, Example of an embedded system, Embedded Design life cycle, Embedded System modeling [flow graphs, FSM, Petri nets], Layers of Embedded Systems.

Unit II: Processor and Memory Organization

Bus Organization, Memory Devices and their Characteristics, Instruction Set Architecture [RISC, CISC], Basic Embedded Processor/Microcontroller Architecture [8051, ARM, DSP, PIC], memory system architecture [cache, virtual, MMU and address translation], DMA, Co-processors and Hardware Accelerators, pipelining.

Unit III: I/O Devices and Networks

I/O Devices[Timers, Counters, Interrupt Controllers, DMA Controllers, A/D and D/A Converters, Displays, Keyboards, Infrared devices], Memory Interfacing, I/O Device Interfacing [GPIB, FIREWIRE, USB, IRDA], Networks for Embedded systems (CAN, I2C, SPI, USB, RS485, RS 232), Wireless Applications [Bluetooth, Zigbee].

Unit IV: Operating Systems

Basic Features of an Operating System, Kernel Features [polled loop system, interrupt driven system, multi rate system], Processes and Threads, Context Switching, Scheduling[RMA, EDF, fault tolerant scheduling], Inter-process Communication, real Time memory management [process stack management, dynamic allocation], I/O[synchronous and asynchronous I/O, Interrupts Handling, Device drivers], RTOS [VxWorks, RT-LINUX].

Unit V: Shell Programming & Kernel Module Programming

Processes – giving more than one command at a time – prioritizing and killing processes – Scheduling Commands – pipes and redirection – regular expression – pattern matching – Scripting using for while, if and other commands. Compiling kernel -Configuring Kernel and compilation, Bootloader and boot process and booting kernel, Kernel code browsers.-Static linking ,dynamic linking of modules-User space - kernel space concepts-System calls - Writing simple modules -Writing Makefiles for modules.

Text Books:

1. Wayne Wolf "Computers as components: Principles of Embedded Computing System Design" The Morgan Kaufmann Series in Computer Architecture and Design, 2008.
2. Jane W. S., Liu, "Real time systems", Pearson Education, 2000.

Reference Books:

1. Raj Kamal, "Embedded systems Architecture, Programming and Design", Second Edition, 2008.
2. Steve Heath, "Embedded Systems Design", EDN Series, 2003.

Course Outcomes:

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

- Define an embedded system and compare with general purpose system.
- Appreciate the methods adapted for the development of a typical embedded system.
- Get introduced to RTOS and related mechanisms.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96414) PRINCIPLES OF COMMUNICATION SYSTEMS
(OPEN ELECTIVE)

III Year B.Tech. II-Sem

L	T	P	C
4	0	0	4

Course Objectives

- To have understanding about different types of AM Communication systems (Transmitters & Receivers)
- To study in detail the different types of FM transmitters & Receivers and PM Transmitters and Receivers
- To gain knowledge about different digital modulation techniques for digital transmission.
- To have knowledge about base band transmission ISI and distortion free base band transmission
- To know the spread spectrum modulation techniques and different multiple access methods.

Unit 1:

Introduction: Communication Systems and types, modulation and multiplexing, Electromagnetic spectrum, Gain, Attenuation and decibels.

Unit 2:

Simple description on Modulation: Analog Modulation-AM, FM, Pulse Modulation-PAM, PWM, PCM, Digital Modulation Techniques-ASK, FSK, PSK, QPSK modulation and demodulation schemes.

Unit 3:

Telecommunication Systems: Telephones Telephone system, Paging systems, Telephony.
Networking and Local Area Networks: Network fundamentals, LAN hardware, Ethernet LANs, Token Ring LAN.

Unit 4:

Satellite Communication: Satellite Orbits, satellite communication systems, satellite subsystems, Ground Stations Satellite Applications, Global Positioning systems.
Optical Communication: Optical Principles, Optical Communication Systems, Fiber –Optic Cables, Optical Transmitters & Receivers, Wavelength Division Multiplexing.

Unit 5:

Multiple Access Techniques: FDMA, TDMA, CDMA, Packet Radio techniques-ALOHA, slotted ALOHA.
Cellular and Mobile Communications: Cellular telephone systems, AMPS, GSM, CDMA, WCDMA.
Wireless Technologies: Wireless LAN, PANs and Bluetooth, ZigBee and Mesh Wireless networks, Wimax and MANs, Infrared wireless, RFID communication, UWB.

Text Books:

1. Principles of Electronic Communication Systems, Louis E. Frenzel, 3e, McGraw Hill publications, 2008.
2. Wayne Tomasi, Introduction to data communications and networking, Pearson Education, 2005.

Reference Books:

1. Tarmo Anttalainen, Introduction to Telecommunications Network Engineering, Artech House Telecommunications Library.
2. Theodore Rappaport, Wireless Communications-Principles and practice, Printice Hall, 2002.
3. Roger L. Freeman, Fundamentals of Telecommunications, 2e, Wiley publications.
4. Kennady, Davis, Electronic Communications systems, 4e, TMH, 1999.

Course Outcomes:

- Identify various elements, processes, and parameters in telecommunications systems, and describe their functions, effects, and interrelationship
- Design procedure of AM transmission and reception, analyze, measure and evaluate the performance of a telecommunication systems and gains given criteria.
- Understand basic components of digital communication systems.
- Design optimum receivers for digital modulation techniques
- Know about deferent error detecting and error correcting codes like block codes, cyclic codes and convolution codes.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96512) DATABASE MANAGEMENT SYSTEMS
(OPEN ELECTIVE)

III Year B.Tech. II Semester **L T P C**
4 0 0 4

Course Objectives:

- This Course provides an emphasis on how to organize, maintain and retrieve information efficiently and effectively from a Database and it presents an introduction to database management systems (DBMS) and relational data model.
- Also the course introduces the concepts of transactions and transaction processing and the issues and techniques relating to concurrency and recovery in multi-user database environments

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UNIT-I

Introduction - Database system Applications - Database System versus File Systems - View of Data– Instances and schema - Data Models - Database Languages -DDL-DML - Database Users and Administrator –Transaction Management - Database System Structure-Application Architectures – History of Database Systems.**(Chapter 1:-Refer Pg.No 1-21)**

UNIT-II

Database Design and ER model – Basic concepts - Entity sets and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Designing of an E-R Database Schema-Reduction of an E-R Schema to Tables.
(Chapter 2:-Refer Pg.No 27-68)

UNIT – III

Introduction to the Relational Model – Structure of Relational Databases - Relational Algebra –Relational Calculus – Domain relational Calculus , Touple Relational Calculus - Integrity and Security –Domain Constraints ,Referential Integrity Constraints-Triggers-security and Authorization – SQL- Basic Structure, Set operations ,Aggregate Operations –Null values-Nested Sub queries – Views –Modification of Database- Joined relations ,Data Definition Language, Embedded SQL ,Dynamic SQL. **(Chapter 3:-Refer Pg.No 79-122,Chapter 6:-Refer Pg.No 222-248, Chapter 4:-Refer Pg.No 135-180)**

UNIT – IV

First Normal Form ,Pitfalls in Relational Database Design-Functional Dependencies– Decomposition – Desirable properties of Decomposition – Boyce-Codd Normal Form — Third Normal Form- Fourth Normal Form. Transactions-Transaction Concept- Transaction state- Implementation of atomicity and Durability- Concurrent Executions – Serializability, Recoverability-Implementation of Isolation **(Chapter 7:-Refer Pg.No 257-293,Chapter 15:-Refer Pg.No 565-584)**

UNIT-V

Concurrency Control-Lock Based Protocols, Timestamp Based Protocols, Validation Based Protocols, Multiple Granularity, Dead Lock Handling-Recovery System – Failure

Classification, Storage Structure , Recovery and Atomicity,Log Based recovery ,Shadow Paging, Recovery with concurrent transactions.
Storage and File Structure - File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices,B+Tree Index files, B- tree index files – Static Hashing – Dynamic Hashing – Comparison of Indexing and Hashing.
Chapter 16:-Refer Pg.No 591-620,Chapter 17:-Refer Pg.No 639-660, Chapter 11:-Refer Pg.No 415-428, Chapter 12:-Refer Pg.No 445-480)

Text Books.

1. Database System Concepts, Silberschatz, Korth , Fourth Edition, McGraw hill (Chapters 1,2 excluding 2.10,3,4 excluding 4.8,4.14,6 excluding 6.6, 6.7,7 excluding 7.9, 7.10,11 excluding 11.1 to 11.5,12 excluding 12.8, 12.9, 15 excluding 15.8, 15.9, 16 excluding 16.5, 16.7, 17 excluding 17.7 to 17.10).

References:

1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
2. Database Management Systems, Raghuramakrishnan, Johannes Gehrke, TATA Mc Graw Hill
3. Data base Systems design, Implementation, and Management, Peter Rob & Carlos Coronel 7th Edition.

Course Outcomes:

- A strong foundation in core Computer Science and Engineering, both theoretical and
- applied concepts.
- An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
- Ability to model, understand, and develop complex software for system software as well as application software.
- An ability to communicate effectively, both in writing and oral.
- The broad education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human contexts
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96513) JAVA PROGRAMMING
(OPEN ELECTIVE)

III Year B. Tech II SEM **L T P C**
4 0 0 4

Course Objectives:

- Modern Computerization methods have matured in the problem solving aspects and presently use the concepts of object oriented treatment of issues.
- Data sets are used with more functional aspects using the concept of classes and objects with a distinct programming methodology which has become predominant.
- Many other important software development techniques are based upon the fundamental ideas employed in object-oriented programming.
- The CSE students are already exposed to preliminaries using C++. Now this course introduces Java and OOPs programming at a higher platform.

UNIT-I

OOP Concepts: Data Abstraction, Encapsulation, Inheritance, Benefits of inheritance, Polymorphism, Classes and Objects, Procedural and Object oriented Programming paradigms.

Java Programming: History of Java, Comments, Data Types, Variables, Constants, Scope and Life Time of Variable, Operators, Operator Hierarchy, Expressions, Type Conversion and Casting, Enumerated Types, Control Flow-Block Scope, Conditional Statements, loops, break, continue statements, simple java stand alone programs, arrays, console input and output, formatting output, constructors, methods, parameter passing, static fields and methods, access control, this reference, overloading methods and Constructors, recursion, garbage collection, Nested Classes, Inner Classes.
(Text Book-1, Page Number:3-159)

UNIT-II

Inheritance: Inheritance hierarchies super and sub classes, Member access rules, super keyword, and method over riding, preventing Inheritance: final classes and methods, the Object class and its methods.

Interfaces- Interfaces vs. Abstract classes, defining an interface, implementing interfaces, accessing implementations through interface references, extending interface.

Packages- Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing Packages.

(TetBook-1, Page Numbers:161-205).

UNIT-III

Exception Handling- Dealing with Errors, benefits of Exception Handling, the classification of exceptions-exception Hierarchy, checked exceptions and unchecked exceptions, Usage of try, catch, throw, throws and finally, re-throwing exceptions, exception specification, built in exceptions, creating own exception sub classes.(TextBook-1: PageNumber:207-225)

Files- streams-byte streams, character streams, text Input/output, binary input/output random access file operations, File management using File class, exploring String Class.

UNIT-IV

Collection Framework in Java- Introduction to Java Collections, Overview of Java Collection Frame work, Generics, Commonly used Collection classes-Array List, Vector, Hash Table, Stack, Enumeration, Iterator, String Tokenizer, Random, Scanner, calendar and Properties.(TextBook-1 PageNumbers: 453-492).

Multi Threading- Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter-thread communication, producer consumer pattern. (TextBook-1 PageNumbers: 227-249).

UNIT-V

GUI Programming with Java- The AWT class Hierarchy, Introduction to Swing, Swing vs. AWT. Introduction to Swing, Swing vs. AWT, Hierarchy for Swing Components, Containers- JFrame, JApplet, JDialog, JPanel, Overview of some swing components- JButton, JLabel, JTextField, JTextArea, simple swing applications.

Applets: Inheritance hierarchy for applets, differences between applets and applications, Life Cycle of an applet,passing parameters to applets, applet security issues. (TextBook-1 PageNumbers: 687-706).

Text Books:

1. Java The Complete Reference, 8th Edition. Hebert Schildt. Indian edition.

Reference Books:

1. Java for Programmers, P.J. Dietel and H.M Dietel,Peearson Education (OR) JAVA: How to Program P.J. Dietel and H.M. Dietel, PHI.
2. Object Oriented Programming through Java, P. Radha Krishna, University Press.
3. Thinking in Java, Bruce Ecel, Pearson Education
4. Programming in Java, S. Malhotra and S. Choudary, Oxford Univ. Press.

Course Outcomes (COs):

Following are the course outcomes that we attain:

- A strong foundation in core computer science and engineering, both theoretical and applied concepts**.**
- An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
- Ability to model, understand, and develop complex software for system software as well as application software.
- An ability to function effectively within teams
- An ability to communicate effectively, both in writing and oral.
- The broad education necessary to understand the impact of computer science and engineering solutions in the scientific, societal and human contexts

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96205) UTILIZATION OF ELECTRICAL ENERGY
(DEPARTMENTAL ELECTIVE-I)

III Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Course Objective:

- This subject deals with the fundamentals of illumination and its classification and the electric heating and welding.
- It gives the detailed study of all varieties of Electric drives and their application to electrical traction systems.

UNIT-I: ELECTRIC DRIVES

Type of electric drives, choice of motor, starting and running characteristics, speed control, temperature rise, particular applications of electric drives, types of industrial loads, continuous, intermittent and variable loads, load equalization.

UNIT-II: ELECTRIC HEATING

Advantages and methods of electric heating, resistance heating induction heating and dielectric heating.

ELECTRIC WELDING

Electric welding, resistance and arc welding, electric welding equipment, comparison between A.C. and D.C. Welding.

UNIT-III: ILLUMINATION

Introduction, terms used in illumination, laws of illumination, polar curves, photometry, integrating sphere, sources of light. Various Illumination Methods. Discharge lamps, MV and SV lamps – comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and flood lighting.

UNIT-IV: ELECTRIC TRACTION-I

System of electric traction and track electrification. Review of existing electric traction systems in India. Special features of traction motor, methods of electric braking-plugging rheostat braking and regenerative braking.

Mechanics of train movement. Speed-time curves for different services – trapezoidal and quadrilateral speed time curves.

UNIT-V: ELECTRIC TRACTION-II

Calculations of tractive effort, power, specific energy consumption for given run, effect of varying acceleration and braking retardation, adhesive weight and coefficient of adhesion.

Text Book:

1. E. Openshaw Taylor, Utilisation of Electric Energy – by University press.
2. Partab, Art & Science of Utilization of electrical Energy –Dhanpat Rai & Sons.

Reference Books:

1. N.V.Suryanarayana, Utilization of Electrical Power including Electric drives and Electric traction, New Age International (P) Limited, Publishers, 1996.
2. C.L. Wadhwa, Generation, Distribution and Utilization of electrical Energy, New Age International (P) Limited, Publishers, 1997.

Course Outcomes:

- Implementation of knowledge of drives to real world problems.
- An ability to function effectively in industry related to drives.
- Ability to apply the technical knowledge in electric traction and application involved in motion control.
- Ability to work in industry related to lightening.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96206) LINEAR SYSTEMS ANALYSIS
(DEPARTMENTAL ELECTIVE-I)

III Year B.Tech. EEE II-Sem **L T P C**
4 0 0 4

Course Objectives:

- To provide students with the modelling of electrical systems.
- To familiarize the students with the state space analysis of dynamic systems and fourier series Representation.
- To make students understand the concepts forurier transforms and laplace transforms approach
- To have the different methods of representation of network synthesis and tsting of Polynomials.
- To familiarize the students with the concepts of sampling and z-transformations

UNIT-I: STATE VARIABLE ANALYSIS

Choice of state variables in Electrical networks-Formulation of state equations for Electrical networks-Equivalent source method. Network topological method - Solution of state equations-Analysis of simple networks with state variable approach.

UNIT–II: FOURIER SERIES AND FOURIER TRANSFORM REPRESENTSATION

Introduction, Trigonometric form of Fourier series, Exponential form of Fourier series, Wave symmetry, Fourier integrals and transforms, Fourier transform of a periodic function , Properties of Fourier Transform , Parseval's theorem , Fourier transform of some common signals, Fourier transform relationship with Laplace Transform.

APPLICATIONS OF FOURIER SERIES AND FOURIER TRANSFORM REPRESENTATION

Introduction, Effective value and average values of non sinusoidal periodic waves, currents, Power Factor, Effects of harmonics, Application in Circuit Analysis, Circuit Analysis using Fourier Series.

UNIT-III: LAPLACE TRANSFORM APPLICATIONS

Application of Laplace transform Methods of Ananlysis – Response of RL, RC, RLC Networks to Step, Ramp, and impulse functions, Shifting Theorem – Convolution Integral – Applications

UNIT-IV: TESTING OF POLYNOMIALS

Elements of realisability-Hurwitz polynomials-positive real functions-Properties-Testing-Sturm's Test, examples.

NETWORK SYSNTHESIS

Synthesis of one port LC networks-Foster and Cauer methods-Synthesis of RL and RC one port networks-Foster and Cauer methods.

UNIT-V: SAMPLING

Sampling theorm – Graphical and Analytical proof for Band Limited Signal impulse sampling, natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, introduction to Band Pass sampling, Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Power density spectrum, Relation between auto correlation function and Energy / Power spectral density function.

Z-TRANSFORMS

Fundamental difference between continous and discrete time signals, discrete time complex, exponential and sinusoidal signals, periodicity of discrete time complex exponential, concept of Z-Transform of a discrete sequence. Distinction between Laplace, Fourier and Z-Transforms. Region of convergence in Z-Transforms, constraints on ROC for various classes of signals, Inverse Z-Transform properties of Z-Transforms.

Text Books:

1. Signals, Systems and Communications by B.P. Lathi, BS Publications 2003.
2. Network Analysis and Synthesis – Umesh Sinha- Satya Prakashan Publications

Reference Books:

1. Linear System Analysis – A N Tripathi, New Age International
2. Network and Systems – D Roy Chowdhary, New Age International
3 Engineering Network Analysis and Filter Desgin- Gopal G Bhisk & Umesh
3. Linear system anlysis by A.Cheng, Oxford publishers.

Course Outcomes:

- Evaluate the design of state space analysis
- Evaluate the fourier series and fourier transform Models
- Techniques for analyzing and design of polynomial testing
- Evaluate the z-transform

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96514) COMPUTER ORGANIZATION
(DEPARTMENTAL ELECTIVE-I)

III Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Objectives:
To make the students learn the fundamentals of computer organization and its relevance to classical and modern problems of computer design, make them understand the structure and behavior of various functional modules of a computer, understand the techniques that computers use to communicate with I/O devices, understand the concepts of pipelining and the way it can speed up processing and to understand the basic characteristics of multiprocessors.

UNIT-1:
BASIC STRUCTURE OF COMPUTERS:
Computer Types, Functional unit, Basic concepts, Bus structures, Software, Performance, Multiprocessors and Multi computers. Decimal Arithmetic unit, Decimal Arithmetic operations, Data Representation, Fixed Point Representation, Floating Point Representation, Error Detection codes.

UNIT-II:
REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS:
Register Transfer language, Register Transfer Bus and Memory Transfers, Arithmetic Micro operations, Logic micro operations, Shift micro operations, Arithmetic logic shift unit, Instruction codes, Computer Registers, Computer instructions, Instruction cycle.

UNIT–III:
MEMORY – REFERENCE INSTRUCTIONS.
Input Output and Interrupt. STACK organization. Instruction formats. Addressing modes, DATA Transfer and manipulation, Program control, Reduced Instruction set computer.
MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit Hard wired control, Micro programmed control

UNIT-IV:
THE MEMORY SYSTEM:
Basic concepts semiconductor RAM memories, Read-only memories, Cache memories performance considerations, Virtual memories secondary storage, Introduction to RAID.
INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes, Priority Interrupt Direct Memory Access. Input-output processor (IOP) Serial communication; introduction to peripheral component, inter connect (PCI) bus introduction to Standard serial communication protocols like RS232, USB, IEEE 1394.

UNIT-V: PIPELINE AND VECTOR PROCESSING:
Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline
Vector Processing, Array Processors.

MULTI PROCESSORS: Characteristics oF Multiprocessors, Interconnection Structures, Interprocessor Arbitration. Inter Processor Communication and Synchronization Cache Coherence.Shared Memory Multiprocessors.

Text Books:

1. M.Moris Mano, Computer Systems Architecture –IIIrd Edition, PHI/Pearson.
2. V.Rajaraman and T.Radhakrishnan, Computer Organization and Architecture, PHI Publications.

References:

1. William Stallings, Computer Organization and Architecture –Sixth Edition, PHI/Pearson.
2. Andrew S. Tanenbaum, Structured Computer Organization –4th Edition PHI/Pearson.
3. Sivaraama Dandamudi Fundamentals or Computer Organization and Design, - Springer Int.
   Edition.
4. Car Hamacher, Zvonks Vranesic, SafeaZaky, Computer Organization –Vth Edition, McGraw
   Hill.

Course Outcomes:

- A strong foundation in core computer science and engineering, both theoretical and applied concepts**.**
- An ability to apply knowledge of mathematics, science, and engineering to real-world problems.
- Ability to model, understand, and develop complex software for system software as well as application software.
- A recognition of the need for, and an ability to engage in life-long learning
- A knowledge of contemporary issues

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96402) DIGITAL SIGNAL PROCESSING
(DEPARTMENTAL ELECTIVE-I)

III Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To provide background and fundamental material for the analysis and processing of digital signals.
- To familiarize the relationships between continuous time and discrete time signals and systems.
- To study fundamentals of time, frequency and Z-plane analysis and to discuss the inter-relationships of these analytic method.
- To study the designs and structures of digital (IIR & FIR) filters from analysis to synthesis for a given specifications.
- The impetus is to introduce a few real-world signal processing applications.
- To acquaint in FFT algorithms, multi-rate signal processing techniques and finite word length effects.

UNIT – I: INTRODUCTION
Introduction to Digital Signal Processing: Sampling process, Discrete time signals & sequences, linear shift invariant systems, stability and causality, Linear constant coefficient difference equations, Frequency domain representation of discrete time signals and systems.

UNIT – II: DISCRETE FOURIER SERIES
Properties and theorems of discrete Fourier series, DFS representation of periodic sequences.
DISCRETE FOURIER TRANSFORMS
Properties of DFT, linear convolution of sequences using DFT, Computation of DFT.
Relation between Z-transform and DFS.
FAST FOURIER TRANSFORMS:
Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT, and FFT for composite.

UNIT III - REALIZATION OF DIGITAL FILTERS
Review of Z-transforms, Applications of Z – transforms, Solution of difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations, Basic structures of IIR systems, Transposed forms, Basic structures of FIR systems, System function, stability criterion.

UNIT – IV - IIR DIGITAL FILTERS
Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, bilinear transformation method and impulse invariance techniques.

FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT – V - INTRODUCTION TO DSP PROCESSORS

Introduction to programmable DSPs: Multiplier and Multiplier Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory, multiport memory, On-Chip Peripherals. All the above with an example of TMS320CXX processors.

Text Books:

1. John G. Proakis, Dimitris G. Manolakis, Digital Signal Processing, Principles, Algorithms, and Applications, Pearson Education / PHI, 2007.
2. A.V.Oppenheim and R.W. Schaffer, Discrete Time Signal Processing, PHI.
3. B.Venkataramani, M. Bhaskar, Digital Signal Processors – Architecture, Programming and Applications, TATA McGraw Hill, 2002.

Reference Books:

1. Andreas Antoniou , Digital Signal Processing:, TATA McGraw Hill , 2006
2. MH Hayes, Schaum's Outlines, Digital Signal Processing:, TATA Mc-Graw Hill, 2007.
3. C. Britton Rorabaugh DSP Primer - Tata McGraw Hill, 2005.
4. Robert J. Schilling, Sandra L. Harris, Fundamentals of Digital Signal Processing using Matlab Thomson, 2007
5. Alan V. Oppenheim, Ronald W. Schafer, Digital Signal Processing –, PHI Ed., 2006 S.Salivahanan Digital Signal Processing-.TMH, 2000.

Course Outcomes:

On completion of this subject, the student should be able to:

- Perform the frequency and Z-transform analysis on signals and systems.
- Understand the inter relationship between DFT and various transforms.
- Design a digital filter for a given specification.
- Understand the fast computation of DFT and appreciate the FFT processing.

Understand the tradeoffs between normal and multi rate DSP techniques and finite length word effects

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96415) IC & PDC LAB

III Year B.Tech. EEE II-Sem

L	T	P	C
0	0	3	2

Course Objects:

- To design and construct the R-C circuits, clippers, clampers. To design and analyses of adder, subtractor using IC741.
- To understand the operations of differentiator and integrator using IC 741.
- To design and analyses of active filer.
- To construct and understand of the different multivibrator using IC 555.
- To construct and analyses different waveform generators IC741.
- To understand the operation of VCO using IC 566.

List of Experiments.

1. Linear Wave Shaping
2 (a). Non Linear Wave Shaping-Clippers
   (b). Non Linear Wave Shaping-Clampers
3. Astable Multivibrator using Transistors
4. Monostable Multivibrator using Transistors
5 (a). Schmitt Trigger using Transistors
   (b). Schmitt Trigger Circuits- using IC 741
6. Measurement of op-Amp parameters
7. Applications of Op-Amp
8. Instrumentation Amplifier using op-Amp
9. Waveform generation using op-amp (square & triangular)
10. Design Of Active Filters – Lpf, Hpf (First Order)
11. Applications of ic 555 timer (Monostable & Astable multivibrators)
12. PLL Using 1C 565
13. IC723 Voltage Regulator
14. Design of VCO using IC 566
15. 4 bit DAC using OP AMP

Note: Minimum of 12 Experiments to be conducted.

Course Outcomes:

- Understand the applications of diode as integrator, differentiator, clippers, clampler circuits.
- Student able to design circuits using operational amplifiers for various applications.
- Student able to understand the VCO & PLL circuits

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96210) CONTROL SYSTEMS & SIMULATION LAB

III Year B.Tech. EEE II-Sem **L T P C**
0 0 3 2

Course Objectives:

- This course introduces the time domain specifications and analysis of various systems
- Modelling and control performance of various linear control systems.
- Design of various time domain controllers and frequency domain compensators
- Performance study of the systems with and without controllers and comparison.
- Modelling and control of linear systems with MATLAB/Simulink and P-Spice software's.

Any TEN of the following experiments are to be conducted:

1. Time response of Second order system
2. Characteristics of Synchro's
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. Lag and lead compensation – Magnitude and phase plot
8. Transfer function of DC generator
9. Temperature controller using PID
10. Characteristics of magnetic amplifiers
11. Characteristics of AC servo motor
12. PSPICE simulation of Op-Amp based Integrator and Differentiator circuits.
13. Linear system analysis (Time domain analysis, Error analysis) using MATLAB.
14. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB
15. State space model for classical transfer function using MATLAB – Verification.

Reference Books:

1. M.H.Rashid, Simulation of Electrical and electronics Circuits using PSPICE, M/s PHI Publications.
2. PSPICE A/D user's manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Books user's manual and – Mathworks, USA.

Course Outcomes:

- Simulate and analyze electrical and electronic circuits.
- Analyze the response of time and frequency response of systems
- Model, simulate and analyze the performance of special Machines.
- Analyze performance of feedback and load frequency control systems

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96211) POWER ELECTRONICS & DRIVES LAB

III Year B.Tech. EEE II-Sem

L	T	P	C
0	0	3	2

Course Objectives:

- This course introduces the basic concept of powers semiconductor devices.
- This course introduces working of all the types of converters and analysis.
- Performance and control of DC and AC Motors with power electronic converters.

Any TEN of the Experiments in Power Electronics Lab

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate firing circuits for SCR's
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase fully controlled bridge converter with R and RL loads
5. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E)
6. Single Phase Cycloconverter with R and RL loads
7. Single Phase half controlled converter with R load
8. Three Phase half controlled bridge converter with R-load
9. Single Phase Bridge converter with R and RL loads
10. Thyristorised drive for PMDC motor with closed loop control
11. Speed control of 3 phase wound rotor Induction motor.
12. Single phase Dual Converter with R & RL Loads
13. operation of MOSFET based Chopper
14. PSPICE simulation of single-phase full converter using RLE loads and single-phase AC voltage Controller using RLE loads.
15. PSPICE simulation of resonant pulse commutation circuit and Buck chopper.
16. PSPICE simulation of single phase Inverter with PWM control.

Course Outcomes:

- Study of Characteristics of SCR, MOSFET & IGBT AND Power Electronics Devices.
- Forced Commutation Circuits (ClassA, ClassB, ClassC, ClassD & ClassE).
- PSPICE Simulation of resonant pulse commutation circuit and Buck chopper.
- PSPICE simulation of inverters with PMM control.
- Able to understand the behaviour of various motors with the power electronic converters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A96002) PERSONALITY DEVELOPMENT AND SOFT SKILLS

III Year B.Tech. EEE II-Sem

L	T	P	C
2	0	0	2

Course Description

The course will enable the students to understand their personality, to know their preferred learning style, grasp their locus of control, improve communication and plunge into their own skills.

Course Objectives

1. To understand one's own personality and enhances successful living.
2. To enable the students to get an idea on the physical, emotional, social, cognitive and moral, locus of control and helps them to be objective in life.
3. Identify the individual's skill and have work –life balance.
4. Communication and its importance will be integrated in the students.
5. To integrate classroom learning and real life observation and application.

UNIT – I: Introduction to personality development and soft skills.

Life/soft skills introduction, Identifying individual's skills, How to work on your skills and barriers one face, Self Awareness, Self concepts, Barriers in self awareness, Guidelines to overcome barriers of Self awareness.

UNIT – II: Communication Skills

Communication Skills, Modes/ Types of communication , Your preferred style of communication , Strengths & weakness in your style of communication, Effective communication, Ineffective communication, Ingredients in communication - Vocabulary - Assertiveness - Expressing gently and clearly - True statements- Set up appropriate expectations - Know your circles - Clarify and reflect.

Working on the barriers of communication -Vague content - Low self esteem- High self esteem - Preconceived ideas - Judgmental attitudes - In appropriate analysis and interpretation of others - Closed cognition skills.

UNIT - III: Dynamics of personality development

Critical thinking, Team Dynamics, Work ethics, Time management, Stress management.

UNIT– IV: Coping Skills

Introduction- Coping with Failure, Coping with Depression, Barriers in overcoming failure and Guidelines for success.

UNIT – V: Procrastination

Introduction to Procrastination – Reasons - Consequences of procrastination - How to deal with procrastination - Applications of all the above skills.

Text Books / References:

1. Barun K Mithra: Personality Development and soft skills. Oxford Higher education.
2. Gopala Swamy Ramesh & Mahadevan Ramesh : The Ace of Soft skills – Attitude, communication, etiquette for success. Pearson Publications.
3. K.G. Ramawat & Dr. k. Alex : Soft Skills- know yourself and know the world. S. Chand and company Pvt Ltd.

Course Outcomes

- The course will enable the students to understand their personality, to know their preferred learning style, grasp their locus of control, improve their standard of communication and plunge into their own skills.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97411) MICROPROCESSORS AND MICROCONTROLLERS ARCHITECTURE AND PROGRAMMING

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:
To develop an in-depth Understanding of

- The Operation of Microprocessors and Microcontrollers,
- Machine Language programming
- Interfacing Techniques.

Unit I Architecture of Microprocessors
(Description) General Definitions of Mini Computers, Microprocessors, Micro Controllers and Digital Signal Processors. Overview of 8085 Microprocessor. Overview Of 8086 Microprocessor. Signals and Pins of 8086 Microprocessor. Physical Memory Organization, General Bus Operation.

Unit II Assembly language of 8086
(Description) Machine Language Instruction Format, Addressing Modes, Assembler Directives and Operators, Data types, Instructions and Programming, Assembly Software Programs with Algorithms

Unit III Interfacing with 8086
(Description) Interfacing with RAMs, ROMs along with the Explanation Of Timing Diagrams. Interfacing with Peripheral ICs like 8255, 8259 etc. Interfacing with key boards, ADCs and DACs etc.

Unit IV Introduction to Microcontrollers
Overview of 8051 Microcontroller, Architecture, Input ports, Memory Organization, Addressing Modes and Instruction Set of 8051, simple Programs.

Unit V 8051 Real time control:
Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counters and Interfacing.

Text Books:

1. D. V. Hall, Microprocessors and interfacing, TMGH, 2nd Edition 2006
2. Kenneth. J. Ayala, The 8051 microcontroller, 3rd ed.,cengage learning.

References:

1. Ramesh S.Gaonkar, “Microprocessor – Architecture, Programming and Applications with the 8085”, Penram International publishing private limited, fifth edition.
2. Doughlas V Hall, “Digital Systems and Microprocessors”, McGraw Hill. 3rd Edition 2003
3. A.K. Ray & K.M.Bhurchandi, “Advanced Microprocessors and peripherals-Architectures, Programming and Interfacing”, TMH, 2002 reprint.
4. Mohamed Ali Mazidi, Janice Gillispie Mazidi, “The 8051 microcontroller and embedded systems”, Pearson education, 2004.

Course Outcomes:

Upon completion of the course:

- The student will learn the internal organization of popular 8086/8051 microprocessors/microcontrollers.
- The student will learn hardware and software interaction and integration.
- The students will learn the design of microprocessors microcontrollers – based systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97201) POWER SYSTEM OPERATION AND CONTROL

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:

- This subject deals with Economic Operation of Power Systems, Hydrothermal scheduling, modeling of turbines, generators and automatic controllers.
- It emphasizes on Single Area and Two Area Load Frequency Control and Reactive Power 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 of Steam Unit, Optimum Generation Allocation with line losses neglected. Optimum Generation Allocation including the effect of Transmission Line Losses, Loss Coefficients, Transmission Line Loss Formula.

UNIT -II Hydrothermal Scheduling

Optimal Scheduling of Hydrothermal system, Hydroelectric Power Plant Models, types of Scheduling Problems, short term Hydrothermal Scheduling Problem.

UNIT -III Load Frequency Control

Modelling of Speed Governing System, Steam Turbine, Hydro Turbine And Generator. 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, Proportional Plus Integral Control of single area and its block diagram representation, Steady State Response. Load Frequency Control of 2- area system, Tie-Line Bias Control, comparison between Load Frequency Control and Economic Dispatch Control.

UNIT- IV Power Factor And Voltage Control

Causes of low P.F, Methods of Improving P.F, Static Capacitor and Synchronous Condensers, Phase Advancers, most Economical P.F. for constant KW load and constant KVA type loads, Voltage Control, Shunt Capacitors, Series Capacitors and their location in the Power System, numerical problems.

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. Brief introduction to role of FACTS devices for Reactive power Control.

Text books:

1. Power system stability and control by Prabha Kundur TMH Publishers
2. Modern Power System Analysis by I.J.Nagrath & D.P.Kothari TMH Publishers, 2nd edition.
3. Electric Energy systems Theory by O.I.Elgerd, TMH Publishers, Second edition.

4. Generation of electrical energy by B. R. Gupta, S. Chand and Company.

Reference books:

1. Power System Analysis and Design by J.Duncan Glover and M.S.Sarma., Thomson Publishers,3rd Edition.
2. Power System Analysis by Grainger and Stevenson, TMH Publishers.
3. Power System Analysis by Hadi Saadat, TMH Publishers.

Course Outcomes:

After completing the course the student shall be able to

- Explain the functional content of Economic Load Dispatch and Load Frequency Control
- Create simple architectures for simple area load frequency control and two area load frequency control
- Understand importance of Reactive Power Compensation
- To gain knowledge of emerging trends in Power systems used for system operation and control.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97202) POWER SYSTEM ANALYSIS

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:

- This Course Introduces Formation of Z_{bus} and Y_{bus} Matrices of a Transmission Line, Load Flow Studies by Various Methods.
- It covers Short Circuit Studies and Stability Analysis of Power System under Steady State and Transient conditions.

UNIT -I Power System Network Matrices-1

Graph Theory: Definitions, Bus Incidence Matrix, Y_{bus} formation by Direct and Singular Transformation Methods, Numerical Problems.

Power System Network Matrices-2: Formation of Z_{Bus}: Partial network, Algorithm for the Modification of Z_{Bus} Matrix for addition of Branch and a Link (Derivations and Numerical Problems).- Modification of Z_{Bus} for the changes in network (Problems).

UNIT –II Power Flow Studies-1

Necessity of Power Flow Studies – Data for Power Flow Studies – Derivation of Static load flow equations – Load flow solutions using Gauss Seidel Method: Acceleration Factor, Load flow solution with and without P-V buses, Algorithm and Flowchart. Numerical Load flow Solution for Simple Power Systems (Max. 3-Buses): Determination of Bus Voltages, Injected Active and Reactive Powers (Sample One Iteration only) and finding Line Flows/Losses for the given Bus Voltages.

Power Flow Studies-2

Newton Raphson Method in Rectangular and Polar Co-Ordinates Form: Load Flow Solution with or without PV Busses- Derivation of Jacobian Elements, Algorithm and Flowchart. Decoupled and Fast Decoupled Methods.- Comparison of Different Methods – DC load Flow.

UNIT – III Short Circuit Analysis-1

Per-Unit System of Representation. Per-Unit equivalent reactance network of a three phase Power System, Numerical Problems.

Symmetrical fault Analysis: Short Circuit Current and MVA Calculations, Fault levels, Application of Series Reactors, Numerical Problems.

UNIT –IV Short Circuit Analysis-2

Symmetrical Component Theory: Symmetrical Component Transformation, Positive, Negative and Zero sequence components: Voltages, Currents and Impedances.

Sequence Networks: Positive, Negative and Zero sequence Networks, Numerical Problems.

Unsymmetrical Fault Analysis: LG, LL, LLG faults with and without fault impedance, Numerical Problems.

UNIT –V Power System Steady State Stability Analysis

Elementary concepts of Steady State, Dynamic and Transient Stabilities. Description of: Steady State Stability Power Limit, Transfer Reactance, Synchronizing Power Coefficient, Power Angle Curve and Determination of Steady State Stability and Methods to improve steady state stability.

Power system transient state stability analysis:

Derivation of Swing Equation. Determination of Transient Stability by Equal Area Criterion, Application of Equal Area Criterion, Critical Clearing Angle Calculation.- Solution of Swing Equation: Point-by-Point Method. Methods to improve Stability - Application of Auto Reclosing and Fast Operating Circuit Breakers.

Text books:

1. Computer Techniques in Power System Analysis by M.A.Pai, TMH Publications.
2. Modern Power system Analysis – by I.J.Nagrath & D.P.Kothari: Tata McGraw-Hill Publishing Company, 3rd Edition, 2011.

Reference books:

1. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill 1st Edition 2003.
2. Power System Analysis – by A.R.Bergen, Prentice Hall of Ind 2ndEdition, 2009.
3. Power System Analysis by Hadi Saadat – TMH 2nd Edition, 2002.
4. Power System Analysis by B.R.Gupta, Wheeler Publications.

Outcomes:

- Able to form Y_{Bus} and Z_{Bus} for real time network.
- Able to make fault calculations for any type of fault.
- Able to find the line flows and line losses.
- Able to change or fix the stability limits for dynamic and transient behavior of power system.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97203) ELECTRICAL DISTRIBUTION SYSTEMS
(DEPARTMENTAL ELECTIVE-II)

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objectives:

- To Study The Fundamental Principles And Various Parts/Components of Power Distribution Systems.
- To Identify The Various Electric Loads & Their Characteristics
- To Impart knowledge of Distribution System Protection.
- To Understand Protective Devices Coordination.
- To Understand Methods for Power Factor Improvement & Voltage Control.

UNIT – I General Concepts

Introduction to Distribution Systems, Load Modelling and characteristics. Coincidence factor, Contribution Factor Loss Factor - Relationship between the Load Factor and Loss Factor. Classification of Loads (Residential, Commercial, Agricultural and Industrial) and their Characteristics.

Distribution Feeders: Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage levels, feeder loading; basic design practice of the secondary distribution system.

UNIT – II Substations

Location of Substations: Rating of Distribution Substation, service area within primary feeders. Benefits derived through Optimal Location of substations.

System Analysis: Voltage Drop and Power-Loss Calculations: Derivation for Voltage Drop and Power Loss in Lines, Manual Methods of Solution for Radial Networks, Three Phase Balanced Primary Lines.

UNIT – III Protection

Objectives of Distribution System Protection, Types of Common Faults and Procedure for Fault Calculations. Protective Devices: Principle of Operation of Fuses, Circuit Reclosures, Line Sectionalizes, and Circuit Breakers

Coordination: Coordination of Protective Devices: General Coordination procedure.

UNIT – IV Compensation for Power Factor Improvement

Capacitive compensation for power-factor control. Different types of power capacitors, shunt and series

Capacitors, effect of shunt capacitors (Fixed and switched), Power factor correction, capacitor allocation

Economic justification - Procedure to determine the best capacitor location.

UNIT – V Voltage Control

Voltage Control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR ,line drop Compensation.

Text book:

1."Electric Power Distribution system, Engineering" – by Turan Gonen, Mc Graw-hill Book Company.
2. Electric Power Distribution – by A.S. Pabla, Tata McGraw-Hill Education, 2004.

Reference book:

1. Electrical Power Distribution and Automation by S.Sivanagaraju, V.Sankar, Dhanpat Rai & Co, 2006
2. Electrical Power Distribution Systems by V.Kamaraju, Right Publishers.

Course Outcomes:

- The student will be able to calculate the Distribution System Voltage Drop calculations
- The student can design the required capacitor to compensate the losses in Distribution System.
- Able to design required capacitor for power factor correction and improvement
- Study the equipment required for voltage control and line drop compensation

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97204) HIGH VOLTAGE ENGINEERING
(DEPARTMENTAL ELECTIVE-II)

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	1	0	4

Course Objective:

- This subject deals with the detailed analysis of Breakdown occurring in gaseous, liquids and solid dielectrics.
- Information about generation and measurement of High voltage and current.
- In addition High voltage testing methods are also discussed.

UNIT-I: Introduction To High Voltage Technology And Applications

Electric Field Stresses, Gas / Vacuum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, rotating machines, circuit breakers, cable power capacitors and bushings.

UNIT- II: Break Down In Gaseous And Liquid Dielectrics

Gases as insulating media, collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, pure and commercial liquids, breakdown in pure and commercial liquids.

Break Down In Solid Dielectrics

Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, solid dielectrics used in practice.

UNIT – III: Generation Of High Voltages And Currents

Generation of High Direct Current Voltages, Generation of High alternating voltages, Generation of Impulse Voltages, Generation of Impulse currents, Tripping and control of impulse generators.

Measurement Of High Voltages And Currents Measurement of High Direct Current voltages, Measurement of High Voltages alternating and impulse, Measurement of High Currents-direct, alternating and Impulse, Oscilloscope for impulse voltage and current measurements.

UNIT – IV: Non-Destructive Testing Of Material And Electrical Apparatus

Measurement of D.C Resistivity, Measurement of Dielectric Constant and loss factor, Partial discharge measurements.

High Voltage Testing Of Electrical Apparatus

Testing of Insulators and bushings, Testing of Isolators and circuit breakers, testing of cables, Testing of Transformers, Testing of Surge Arresters, and Radio Interference measurements.

UNIT – V: Over Voltage Phenomenon And Insulation Co-Ordination

Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

Text books:

1. M.S.Naidu and V. Kamaraju , High Voltage Engineering by– TMH Publications, 3rd Edition
2. E.Kuffel, W.S.Zaengl, J.Kuffel, High Voltage Engineering: Fundamentals by Elsevier, 2nd Edition.

Reference books:

1. C.L.Wadhwa , High Voltage Engineering by, New Age Internationals (P) Limited, 1997.
2. Ravindra Arora, Wolfgang Mosch, High Voltage Insulation Engineering by, New Age International (P) Limited, 1995.
3. Mazen Abdel Salam, Hussein Anis, Ahdan El-Morshedy, Roshdy Radwan, Marcel DekkerHigh Voltage Engineering, Theory and Practice.

Course Outcomes:

- Able to learn high voltage technology and applications in transformers, rotating machines, circuit breakers and cable power capacitors
- Acquire the knowledge on breakdown in solid, Liquid and gascons dielectrics.
- Able to get the knowledge on generation of high voltage and current and able to measure them.
- Able to nondestructive testing of material and electrical apparatus.
- Get the knowledge on over voltage phenomenon and insulation co-ordination.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97205) MODERN POWER ELECTRONIC CONVERTERS
(DEPARTMENTAL ELECTIVE-II)

IV Year B.Tech. EEE I-Sem	**L**	**T**	**P**	**C**
	4	**1**	**0**	**4**

Course Objectives: With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization. This course

- Introduces the Modern Power Semiconductor Devices,
- To get the knowledge of Resonant Pulse Inverters
- To get the Knowledge of Resonant Converters, Multilevel Inverters.

UNIT-I: Modern Power Semiconductor Devices
Modern Power semiconductor devices – MOS Turn Off Thyristor (MTO) – Emitter Turn off Thyristor (ETO) – Intergrated Gate-Commutated thyristor (IGCTs) – MOS-controlled thyristors (MCTs) – Static Induction Thyristors (SITHs) –Power Integrated circuits (PICs) Symobol.Structure and equivalent circuit- comparison of their features.

UNIT – II: Resonant Pulse Inverters
Resonant Pulse Inverters- Series Resonant Inverters-series resonant inverters with Unidirectional Switches-series resonant inverters with bidirectional switches- Analysis of Half Bridge resonant inverter – Evaluation of currents and voltages of a simple Resonant Inverter – Analysis of Half Bridge And Full Bridge Resonant Inverter with bidirectional switches

UNIT-III: Resonant Converters

Resonant converter – Zero Current Switching Resonant Converters – L type ZCS resonant converter – M type ZCS resonant converter – Zero Voltage Switching Resonant Converters – comparison between ZCS and ZVS Resonant Converters – Two quadrant ZVS resonant converters – resonant dc link inverters – evaluation of L and C for a Zero Current Switching inverter-Numerical problems

UNIT-IV: Multilevel Inverters -I

Multilevel concept – Classification of Multilevel Inverters – Diode Clamped Multilevel inverter – Improved Diode Clamped Inverters– Flying Capacitor Multilevel Inverters – Principle Of Operation – Main Features.

UNIT-V: Multilevel Inverters -II
Cascaded Multilevel Inverter – Principle Of Operation – main features – Multilevel inverter applications – Reactive Power Compensation – back to back intertie system – adjustable drives- switching device currents – dc link capacitor voltage balancing – features of Multilevel inverters – comparisons of multi level converters

Text books:

1. Power Electronics – Mohammed H. Rashid – Pearson Education Third Edition – First Indian reprint 2004.
2. Power Electronics – Ned Mohan, Tore M. Undeland and William P. Robbins – John Wiley and Sons – Second Edition.
3. Power Electronics Devices, Circuits and Industrial applications, V. R. Moorthi, Oxford University Press

Reference books:

1. Power Electronics, Dr. P. S. Bimbhra, Khanna Pubishers.
2. Elements of Power Electronics, Philip T. Krein, Oxford University Press.

Course Outcomes: At the end of the course, the students will be able to

- Distinguish between different types of Modern power semiconductor devices and their characteristics.
- Analyze of Resonant Converters
- Analyze ZVS and ZCS techniques

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97206) DIGITAL CONTROL SYSTEMS
(DEPARTMENTAL ELECTIVE-III)

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To equip the students with the basic knowledge of A/D and D/A conversion
- To understand the basics of Z- Transform
- To study the stability analysis of digital control system
- Analyze digital control systems using state-space methods.
- Analyze digital control systems using transform techniques (frequency response) and state-space methods (pole-assignment).

UNIT I: Introduction To Digital Control Systems And Z-Transforms

Introduction - Merits and Demerits of Digital Control Systems - Practical aspects of the choice of sampling rate and Multirate sampling - Basic discrete time signals - Quantization – Sampling Theorem - Data Conversions and Quantization - Sampling process - Mathematical Modeling - Data Reconstruction and Filtering of sampled signals – Zero - Order Hold (ZOH).

z- Transform and Inverse z-Transform, Relationship between s - plane and z - plane - Difference equation - Solution by recursion and z-Transform - Pulse Transfer Functions of the ZOH and relationship between G(s) and G(z)– Bilinear Transformation .

UNIT II: Input/output Analysis Of Digital Control Systems

Pulse transfer function - z transform analysis of open loop, closed loop systems - Modified z Transform - transfer function - Stability of linear digital control systems - Stability tests – Jury Stability test.

Root loci - Frequency domain analysis - Bode plots - Gain margin and phase margin.

UNIT III: Design of Controllers for I/O Model Digital Control Systems

Cascade and Feedback Compensation by continuous data controllers - Digital controllers - Design using Bilinear Transformation - Realization of Digital PID controllers, Design of Digital Control Systems based on Root Locus Technique.

UNIT IV: State Space Analysis And State Feedback Control Design Of Digital Control Systems

State Equations of discrete data systems, solution of discrete state equations, State Transition Matrix: Computation methods for State Transition Matrix: z - transform method. Relation between State Equations and Pulse Transfer Functions. Concepts on Controllability and Observability - Pole placement design by state feedback.

UNIT V: Digital State Observer And Stability Analysis

Design of the full order and reduced order state observer, Design of Dead beat Controller - some case studies - Stability analysis of discrete time systems based on Lyapunov approach.

Text books:

1. K. Ogata, Discrete Time Control Systems, PHI/Addison - Wesley Longman Pte. Ltd., India, Delhi,1995.
2. B.C Kuo, Digital Control Systems, 2nd Edition, Oxford Univ Press, Inc., 1992.

Reference books:

1. F. Franklin, J.D. Powell, and M.L. Workman, Digital control of Dynamic Systems, Addison - Wesley Longman, Inc., Menlo Park, CA , 1998.
2. M. Gopal, Digital Control and State Variable Methods, Tata McGraw Hill, India, 1997.
3. C. H. Houpis and G.B. Lamont, Digital Control Systems, McGraw Hill, 1985.
4. John S. Baey, Fundamentals of Linear State Space Systems, Mc. Graw – Hill, 1st edition.
5. Bernard Fried Land, Control System Design, Mc. Graw – Hill, 1st edition.
6. Dorsay, Continuous and Discrete Control Systems, McGraw - Hill.

Course outcomes:

- This course provides a foundation in discrete-time linear control system theory.
- Analyze digital control systems using transform techniques (frequency response) and state-space methods (pole-placement).
- Analyzing and understanding the challenges to interface digital computing devices with the Analog dynamics of most real-world systems.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97207) H.V.D.C. TRANSMISSION
(DEPARTMENTAL ELECTIVE-III)

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	0	0	4

Course objectives:

- To impart the students with different technologies available for High Voltage Power System
- Different control strategies for efficient operation of the power system under normal and abnormal conditions.

UNIT – I: Basic Concepts

Economics & Terminal equipment of HVDC Transmission Systems: Types of HVDC Links – Apparatus required for HVDC Systems – Comparison of AC & DC Transmission, Application of DC Transmission System – Planning & Modern trends in D.C. Transmission. Brief discussion on role of HVDC Technology in Indian Power Sector.

UNIT – II: Analysis of HVDC Converters

Choice of Converter configuration – analysis of Graetz – characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star – star mode – their performance.

Converter & HVDC system control: Principle of DC Link Control – Converters Control Characteristics – Firing angle control – Current and extinction angle control – Effect of source inductance on the system; Starting and stopping of DC link; Power Control.

UNIT – III: Reactive Power Control in HVDC

Reactive Power Requirements in steady state-Conventional control strategies-Alternate control strategies-sources of reactive power-AC Filters – shunt capacitors-synchronous condensers.

Power Flow Analysis In Ac/Dc Systems: Modeling of DC Links - DC Network - DC Converter - Controller Equations - Solution of DC load flow – P.U. System for D.C quantities - solution of AC - DC Power flow-Simultaneous method - Sequential method.

UNIT-IV: Converter Fault & Protection

Converter faults – protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers –Audible noise-space charge field-corona effects on DC lines-Radio interference.

UNIT – V: Harmonics

Generation of Harmonics –Characteristics harmonics, calculation of AC Harmonics, Non-Characteristics harmonics, adverse effects of harmonics – Calculation of voltage & Current harmonics – Effect of Pulse number on harmonics

Filters: Types of AC filters, Design of Single tuned filters –Design of High pass filters.

Text books:

1. K.R. Padiyar –"HVDC Power Transmission Systems: Technology and system Interactions" – New Age International (P) Limited, and Publishers.
2. S.S.Rao—"EHVAC and HVDC Transmission Engineering and Practice"
3. Prabha Kundur- "Power System Stability and Control" TMH edition-2004

Reference books:

1. E.W.Kimbark –"HVDC Transmission –Direct Current Transmission "– John Wiley & Sons.
2. E.Uhlmann –"Power Transmission by Direct Current" – B.S.Publications.

Course Outcomes:

After completion of this Course, the student will be able to

- Understand the complete operation of HVDC Converter stations.
- Understand the Power Flow Control on HVDC Transmission system.
- Understand the Operation of the controller for HVDC in worst and normal operations.
- Design the Various filters.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97208)POWER QUALITY
(DEPARTMENTAL ELECTIVE-III)

IV Year B.Tech. EEE I-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To study and understand the definitions and issues of various Power Quality problem
- To know the Mitigation and Measuring Techniques related to Power Quality.

UNIT-I: Introduction

Introduction of the Power Quality (PQ) problem, Terms used in PQ: Voltage, Sag, Swell, Surges, Harmonics, Over Voltages, spikes, Voltage fluctuations, Transients, Interruption, overview of Power Quality phenomenon, Remedies to improve power quality, power quality monitoring.

UNIT-II: Long & Short Interruptions

Interruptions – Definition – Difference between failures, outage, Interruptions – causes of Long Interruptions – Origin of Interruptions – Limits for the Interruption frequency – Limits for the interruption duration – costs of Interruption – Overview of Reliability evaluation to power quality,

Comparison of observations and reliability evaluation.

Short Interruptions: definition, origin of short interruptions, basic principle, fuse saving, voltage magnitude events due to re-closing, voltage during the interruption, monitoring of short interruptions, difference between medium and low voltage systems. Multiple events, single phase tripping – voltage and current during fault period, voltage and current at post fault period, stochastic prediction of short interruptions.

UNIT III: 1 & 3-Phase Voltage Sag Characterization

Voltage sag – definition, causes of voltage sag, voltage sag magnitude, and monitoring, theoretical calculation of voltage sag magnitude, voltage sag calculation in non-radial systems, meshed systems, and voltage sag duration.

Three phase faults, phase angle jumps, magnitude and phase angle jumps for three phase unbalanced sags, load influence on voltage sags.

UNIT-IV: Power Quality Considerations In Industrial Power Systems

Voltage sag – equipment behavior of Power electronic loads, induction motors, synchronous motors, computers, consumer electronics, adjustable speed AC drives and its operation. Mitigation of AC Drives, adjustable speed DC drives and its operation, mitigation methods of DC drives.

UNIT-V: Mitigation Of Interruptions & Voltage Sags

Overview of mitigation methods – from fault to trip, reducing the number of faults, reducing the fault clearing time changing the Power System, installing mitigation equipment, improving equipment immunity, different events and mitigation methods. System equipment interface –voltage source converter, series voltage controller, shunt controller, combined shunt and series controller.

Power quality and EMC standards: Introduction to standardization, IEC Electromagnetic compatibility standards, European Voltage Characteristics standards, PQ surveys.

Text Books:

1. Understanding Power Quality Problems" by Math H J Bollen. IEEE Press.
2. Electrical Power Systems Quality, Roger C. Dugan , Mark F. Mc Granaghan, Surya Santoso, H. Wayne Beaty, Tata McGraw Hill Education Private Ltd

Reference book:

1. Power Quality VAR Compensation in Power Systems, R. SastryVedam Mulukutla S. Sarma, CRC Press.
2. Power Quality, C. Sankaran, CRC Presss.

Course outcomes:

After completion of the course, the student should be able to know

- Basic concepts of power quality issues.
- Voltage and current during the fault period of a given power system.
- Sags and phase angle jumps in different types of faults.
- Various equipment behavior with voltage sags.
- Various interfacing devices between system and equipment to mitigate the sags and interruptions

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97212) POWER SYSTEMS LAB

IV Year B.Tech. EEE I-Sem **L T P C**
0 0 3 2

Course Objectives:
This course is aimed to gain knowledge on

- Performance of Transmission Line.
- Operation and Performance of Over/Under Voltage and Over Current relays.
- Calculation of Sequence Impedances of 3-Φ Transformer.
- Operation of Electromagnetic type IDMT Over Current Relay.
- Fault analysis of Feeder and Alternator.

List of Experiments:

1. Performance and testing of Transmission Line Model.
2. Characteristics of Under Voltage Relay.
3. Characteristics of Over Voltage Relay.
4. Characteristics of IDMT Over Current Relay.
5. Performance and testing of Feeder protection system
6. Characteristics of Static Negative Sequence Relay.
7. Fault analysis of an Alternator- Line to Ground Fault.
8. Fault analysis of an Alternator- Line to Line Fault.
9. Determination of Sequence Impedances of 3-Φ Transformer.
10. Differential Protection of 1-Φ Transformer.

Course Outcomes:
After completion of this course students gain knowledge on

- Calculation of Transmission line parameters, efficiency and regulation.
- Performance analysis of Over/Under Voltage Relay.
- Analysis and performance testing of Feeder Protection System
- Calculation of Sequence Reactances of 3-Φ Transformer.
- Application and usage of IDMT Over Current Relay.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A97412) MICROPROCESSORS AND MICROCONTROLLERS LAB

IV Year B.Tech. EEE I-Sem **L T P C**
0 0 3 2

Course Objectives:

To develop an in-depth understanding of,

- Operation of microprocessors and microcontrollers
- Machine language programming
- Interfacing techniques.

The following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

List of Experiments:

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Interfacing to 8086 and programming to control stepper motor.
8. Programming using arithmetic, logical and bit manipulation instructions of 8051.
9. Program and verify Timer/ Counter in 8051.
10. Program and verify Interrupt handling in 8051
11. UART Operation in 8051.
12. Communication between 8051 kit and PC.
13. Interfacing LCD to 8051.
14. Interfacing Matrix/ Keyboard to 8051.

Note: Minimum Ten experiments are to be conducted.

Course Outcomes

- Demonstrate experimentally basic programming of Microprocessor.
- Exhibit Microprocessor Interfacing with various peripherals for various applications.
- Demonstrate experimentally basic programming of Microcontroller.
- Exhibit Microprocessor Interfacing with various peripherals for various applications.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)
(A98624) MANAGEMENT SCIENCE

IV Year B.Tech. EEE II-Sem **L T P C**
4 0 0 4

Objectives: This course is intended to familiarize the students with the framework for

- Understanding and making decisions relating to issues related Organizational Structure
- Production Operations & Marketing
- Human Resource Management
- Product Management and Strategy.

UNIT - I: Introduction to Management and Organization

Concepts of Management and organization- nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory-Fayal's Principles of Management- Maslow's theory of Hierarchy of Human Needs- Douglas McGregor's Theory X and Theory Y - Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management, Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

UNIT - II: Operations and Marketing 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 - Business Process Reengineering(BPR) - Statistical Quality Control: control charts for Variables and Attributes (simple Problems) and Acceptance Sampling, TQM, Six Sigma, Deming's contribution to quality, Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Store Records - JIT System, Supply Chain Management, Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT - III: Human Resources Management (HRM)

Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Seperation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating - Capability Maturity Model (CMM) Levels - Performance Management System.

UNIT - IV: 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).

UNIT - V: Strategic Management and Contemporary Strategic Issues

Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

Text books:

1. Aryasri: Management Sciences, 2/e, TMH, 2005.
2. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004.
3. P. Vijay Kumar, N. Appa Rao and Ashnab, Chnalill, Cengage Learning India, 2012.

Reference books:

1. Kotler Philip and Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz and Weihrich: Essentials of Management, McGraw Hill, 2012.
3. Thomas N. Duening and John M. Ivancevich Management - Principles and Guidelines, Biztantra, 2012.
4. Kanishka Bedi, Production and Operations Management, Oxford Uiversity Press, 2012.
5. Samuel C. Certo: Modern Management, 2012.
6. Schermerhorn, Capling, Poole and Wiesner: Management, Wiley, 2012.
7. Parnell: Strategic Management, Cengage, 2012.
8. Lawrence R Jauch, R. Gupta and William F. Glueck: Business Policy and Strategic Management Science, McGraw Hill, 2012.

Course Outcomes:

By the end of the course, the student will be in a position to

- Plan an organizational structure for a given context in the organisation carry out production operations through Work study.
- Carry out production operations through Work study.
- Understand the markets, customers and competition better and price the given products appropriately.
- Ensure quality for a given product or service.
- Plan and control the HR function better.
- Plan, schedule and control projects through PERT and CPM.
- Evolve a strategy for a business or service organisation.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A98201)POWER SYSTEM DEREGULATION
(DEPARTMENTAL ELECTIVE-IV)

IV Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- To impart knowledge on fundamental concepts of deregulated electrical market systems
- Power business and technical issues involved in a restructured power system of both Indian and world scenario

UNIT I Need and conditions for Deregulation:
Introduction of market structure, Market architecture, Spot Market, Forward markets and settlements. Review on concepts of Marginal Cost of Generation, Least-Cost Operation, Incremental Cost of Generation. Comparison between old and new Power System Operation.

UNIT II Electricity sector structures and ownership /management:
The forms of Ownership and Management. Different structure models like monopoly model, agency model, wholesale competition model, Retail competition model.

UNIT III Locational Marginal Pricing:
Framework and methods for the analysis of Bilateral and Pool Markets, LMP based markets, Auction Models and Price Formation, Price based Unit Commitment.

UNIT IV Transmission network and Market Power:
Power wheeling transactions and Marginal Costing, Transmission Costing. Congestion Management methods- Market splitting, counter-trading, effect of congestion on LMPs.

UNIT VAncillary Services and System Security in Deregulation:
Classification and Definitions, Ancillary services management in various markets, Regulatory issues involved in the deregulation of the power industry.

Text Books:

1. Power System Economics: Designing markets for Electricity by S. Stoft, John Wiley & Sons Inc Publishers, 2002.
2. Operation of Restructured Power Systems by K. Bhattacharya, M.H.J. Bollen and J.E. Daalder, Kluwer academic publishers, 2001.

Reference Books:

1. Market Operations in Electric Power Systems by M. Shahidehpour, H. Yamin and Z. Li John Wiley & Sons Inc Publishers, 2002
2. Fundamentals of power system economics by S. Kirschen and G. Strbac John Wiley & Sons, Ltd

Course Outcomes:

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

- Understand the developments in Restructuring of Power Systems.
- Explore issues like Congestion Management, Transmission Pricing, Ancillary Services Management.
- Analyze the concepts of Locational Marginal Pricing and Financial Transmission Rights.
- Understand typical issues in Electricity Markets and how these are handled world-Wide in various markets

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A98202) ENERGY AUDITING, CONSERVATION AND MANAGEMENT
(DEPARTMENTAL ELECTIVE-IV)

IV Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- The course provides basic understanding of Energy Audit And Management.
- Essential theoretical and practical knowledge about the concept of Energy Conservation, Energy Management, and different approaches of Energy Conservation in industries,
- Economic aspects of Energy Conservation Project and Energy Audit and measuring instruments in commercial and industrial sector will be aimed in this course.

UNIT-I: Basic Principles of Energy Audit
Energy audit- definitions, concept , types of audit, Energy Index, Cost Index ,Pie Charts, Sankey diagrams, load profiles, Energy conservation schemes- Energy audit of industries- energy saving potential, energy audit of process industry, thermal power station, building energy audit.

UNIT-II: Energy Management
Principles of energy management, organizing energy management program, initiating, planning, controlling, promoting, monitoring, reporting- Energy manger, Qualities and functions, language, Questionnaire – check list for top management.

UNIT-III: 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.

UNIT-IV: Power Factor Improvement, Lighting And Energy Instruments
Power factor – methods of improvement, location of capacitors, Pf with non linear loads, effect of harmonics on power factor, power factor motor controllers - Good lighting system design and practice, lighting control ,lighting energy audit - Energy Instruments- wattmeter, data loggers, thermocouples, pyrometers,lux meters, tongue testers ,application of PLC's.

UNIT-V: Economic Aspects And Analysis
Economics Analysis-Depreciation Methods, time value of money, rate of return , present worth method , replacement analysis, life cycle costing analysis- Energy efficient motors- calculation of simple payback method, net present worth method- Power factor correction, lighting -Applications of life cycle costing analysis, return on investment .

Text books:

1. Energy Management: W.R.Murphy, G.Mckay, Butterworths Scientific
2. Energy Management Principles, C.B.Smith, Pergamon Press
3. Industrial Energy Conservation, D.A. Reay, Pergammon Press
4. Energy Management Handbook, W.C. Turner, John Wiley and Sons, A Wiley Interscience
5. Industrial Energy Management and Utilization, L.C. Witte, P.S. Schmidt, D.R. Brown, Hemisphere Publication, Washington, 1988

6. Hand Book of Energy Audits, Albert Thumann, P.E., C.E.M. William J. Younger, C.E.M., CRC Press.

Reference books:

1. Energy management by Paul o' Callaghan, Mc-graw Hill Book company-1st edition, 1998.
2. Energy efficient electric motors by John .C. Andreas, Marcel Dekker Inc Ltd-2nd edition, 1995.
3. Energy management and good lighting practice: fuel efficiency- booklet12-EEO.
4. Energy Audit and Management, Volume-I, IECC Press.
5. Energy Efficiency in Electrical Systems, Volume-II, IECC Press.

Course Outcomes:

After learning the course the students should be able to,

- Understand the basic knowledge of Different terms & principles of energy audit and management.
- Assess the energy saving & conservation in different electrical systems
- Understand about heat utilization, saving and recovery in different thermal system
- Learn the preparation of energy audit report & Different cases related to industries.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A98203) SWITCH MODE POWER SUPPLIES
(DEPARTMENTAL ELECTIVE-IV)

IV Year B.Tech. EEE II-Sem

L	T	P	C
4	0	0	4

Course Objectives:

- Switched Mode Power Supplies (SMPS) are Power Electronic circuits that perform power conversion by operating as semiconductor switch in on-off mode at high frequencies.
- The aim of this course is to give mathematical tools for Steady-State and Dynamic analysis. The necessary tools required in the design of SMPS such as magnetic elements and controllers.

UNIT-I: Switched Mode Power Conversion

Introduction to Switched Mode Power Supply**,** Linear DC to DC Power converters, Non-Idealities in reactive elements, Design of Inductors, Design of Transformers- Copper loss , Power factor, Non-isolated topologies, Isolated topologies, Quasi-resonant zero-current/zero-voltage switch Operating principle of Non-Isolated DC to DC power Converters (Buck, Boost, Buck-Boost, and Cuk) Equivalent circuit model of the non-isolated DC-DC converters. Isolated converters (forward, Fly back).

UNIT-II: Multiple Output Flyback Switch Mode Power Supplies

Introduction, operating Modes, operating principles, Direct off line Flyback Switch Mode Power Supplies, Flyback converter snubber network, Problems.

UNIT-III: Power Semiconductors In Switched Mode Topologies

Introduction to Switched Mode Power Supply Topologies, The Power Supply Designer's Guide to High Voltage Transistors, Base Circuit Design for High Voltage Bipolar Transistors in Power Converters, Isolated Power Semiconductors for High Frequency Power Supply Applications.

UNIT-IV: Rectification

Explanation, Advantages and disadvantages, SMPS and linear power supply comparison, Theory of operation , Input rectifier stage, Inverter stage, Voltage converter and output rectifier, Regulation, An Introduction to Synchronous Rectifier Circuits using Power MOS Transistors.

UNIT-V: Switch Mode Variable Power Supplies

Introduction, Variable SMPS techniques, Operating Principles, Practical Limiting Factors, Efficiency and EMI Applications.

Resonant Power Supplies: An Introduction to Resonant Power Supplies, Resonant Power Supply Converters - The Solution for Main Pollution Problems.

Text books:

1. "Switch Mode Power Supplies" by Keith H. Billings Taylor Morey- Tata McGraw-Hill Publishing Company, 3rd edition.
2. "Switch Mode Power Supplies", Robert W. Erickson.

Reference books:

1. Switching Power Supplies A-Z, Second Edition- Sanjaya Maniktala.
2. Steven M. Sandler, Switch Mode Power Supplies, Tata McGraw Hill.

Course Outcomes:

After learning the course the students should be able to,

- Know the Steady-State Analysis of Switched Mode Power Supply.
- Design Equivalent circuit model for a Switching Power Supply.
- Design of Magnetic Components (i.e., inductor and transformer) in a Converter.
- Know the Selection criteria for component values, Power Semiconductors and Controller IC in a converter.
- Design Feedback Controller for Regulated Output Voltage.

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VAAGDEVI COLLEGE OF ENGINEERING
(AUTONOMOUS)

(A98204)ARTIFICIAL NEURAL NETWORKS AND FUZZY SYSTEMS
(DEPARTMENTAL ELECTIVE-IV)

IV Year B.Tech. EEE II-Sem **L T P C**
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Course objective:

- The aim of this course is to provide students with an understanding of the fundamental theory of Neural Networks and Fuzzy Systems.
- The objective is intended for students to apply Neural Networks and Fuzzy Systems to model and solve complicated practical problems such as Recognition.
- To cater the knowledge of Neural Networks and Fuzzy Logic Control and use these in developing Artificial Intelligence based control of Real Time Systems.

UNIT – I: Introduction To Neural Networks

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

Essentials Of Artificial Neural Networks: Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application.

UNIT–II: Feed Forward Neural Networks

Single Layer Feed Forward Neural Networks: Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

Multilayer Feed Forward Neural Networks: Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT III: Associative Memories

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory).

Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem .

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

UNIT – IV: Classical And Fuzzy Sets

Introduction to classical sets - Properties, Operations and Relations; Fuzzy Sets, Membership, Uncertainty, Operations, Properties, Fuzzy Relations, Cardinalities, Membership Functions.

UNIT V: Fuzzy Logic System

Fuzzification, Membership value assignment, Development of Rule Base and Decision Making System, Defuzzification to Crisp Sets, Defuzzification methods.

Text books:

1. Kosko, B, "*Neural Networks and Fuzzy Systems: A Dynamical Approach to Machine Intelligence*", PrenticeHall, NewDelhi, 2004.
2. Timothy J Ross, "*Fuzzy Logic with Engineering Applications*", John Willey and Sons, West Sussex, England, 2005.
3. Rajasekharan and Pai, Neural Networks, Fuzzy logic, Genetic algorithms: synthesis andapplications– PHI Publication.
4. Satish Kumar, Neural Networks, TMH, 2004.

Reference books:

1. Jacek M. Zurada, "*Introduction to Artificial Neural Systems*",PWS Publishing Co., Boston, 2002.
2. S. Kumar, "Neural Networks: A Classroom Approach," McGraw Hill, 2005.

Course Outcomes:

After learning the course the students should be able to

- Know the concepts of Feed Forward Neural Networks.
- Provide adequate knowledge about Feedback Networks.
- Know the concept of fuzziness involved in various systems.
- Get the knowledge about Fuzzy Set Theory.
- Provide comprehensive knowledge of Fuzzy Logic Control and Adaptive Fuzzy Logic and to design the Fuzzy Control using Genetic Algorithm.
- Provide adequate knowledge of application of Fuzzy Logic Control to Real Time Systems in Engineering.

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