ACADEMIC REGULATIONS

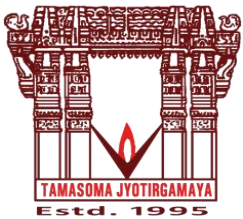
COURSE STRUCTURE AND

DETAILED SYLLABUS

Electrical and Electronics Engineering

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2012-2013)



VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

An Autonomous Institute
Approved by AICTE & Affiliated to JNTUH
Accredited by NBA and NAAC with 'A' Grade

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VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY
HYDERABAD
An Autonomous Institute
Approved by AICTE, New Delhi and Govt. of A.P & Affiliated to JNTUH

ACADEMIC REGULATIONS FOR B.TECH. DEGREE COURSE

(Applicable for Students admitted from the academic year 2012-2013)

1. 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 and Electronics Engineering
03	Mechanical Engineering
04	Electronics and Communication Engineering
05	Computer Science and Engineering.
10	Electronics and Instrumentation Engineering
12	Information Technology
24	Automobile Engineering

1.1 Eligibility Criteria for Admission

The eligibility criteria for admission into engineering programmes shall be as mentioned below:

The candidate shall be an Indian National / NRI

The candidate should have completed 16 years of age as on 31st December of the academic year for which the admissions are being conducted.

The Candidate should have passed the qualifying examination (10+2) or equivalent as on the date of admission.

Seats in each programme in the Institution are classified into **Category** A and **Category** B as per the G.Os.

1.1.1 Category – A Seats

These seats will be filled through counseling as per the rank at the Common Entrance Test (EAMCET) conducted by the State Government and as per other admission criteria laid down in the G.Os.

1.1.2 Category - B Seats

These seats will be filled by the institute as per the G.Os Issued by State Government from time to time.

1.1.3 Category: Lateral Entry

The candidate shall be admitted into the Third Semester, based on the rank secured by the candidate at Engineering Common Entrance Test (ECET(FDH)) by the Convener, ECET.

2. Distribution and Weightage of Marks

i. The performance of a student in each Semester shall be evaluated subject – wise with **a maximum of 100 marks for theory and 100 marks for practical subjects.** In addition, an Industry oriented mini-project, Seminar, Comprehensive viva-voce, and Project Work shall be evaluated for **50, 50, 50 and 200 marks** respectively.

ii. For theory subjects the distribution shall be **30 marks for Mid Semester Evaluation** and **70 marks for the End-Examination**.

For theory subjects, Two mid examinations will be conducted in each Semester as per the academic calendar. Each mid examination is evaluated for 25 marks.

Two assignments are to be given to students covering the syllabus of first Mid and second Mid examinations and are evaluated for 5 marks each. .

The first assignment shall be submitted before first mid examinations and second Assignment should be submitted before second mid examination.

At the end of the Semester, Internal Marks (Maximum 30) for the respective subject is assigned as follows:

(a) 25 marks: 80% from the best performed Mid examination and 20% from the other Mid examination.

(b) 5 marks: Average of the two assignment marks

iii. For practical subjects there shall be a continuous evaluation during the Semester for 30 **marks and 70 marks for end examination**. Out of the 30 marks, **day-to-day work in the laboratory shall be evaluated for 10 marks**, and 10 marks for practical examination (two practical examinations will be conducted and the average of the two examinations will be taken into account) and 10 marks for laboratory record.

NOTE: A student who is absent for any assignment/Mid term examination for any reason what so ever shall be deemed to have secured 'zero' marks in the test/examination and no makeup test/examination shall be conducted.

iv For the subjects having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing, Production Drawing Practice, and Estimation etc.,) the distribution shall be 30 **marks for internal evaluation (15 marks for day-to-day work and 15 marks for Mid**

examination (the average of the two examinations will be taken into account**) and 70 marks for end semester examination.** There shall be **two Mid examinations** in a Semester.

V There shall be an **industry-oriented mini-Project**, in collaboration with an industry of their specialization, to be taken up during the a summer vacation after III year II Semester examination. The **mini project shall be evaluated during the IV year I Semester.** The industry oriented mini project shall be submitted in report form and should be presented before a committee, which shall be evaluated for **50 marks.** The committee consists of Head of the Department, the supervisor of mini project and a senior faculty member of the department. There shall be **no Midterm assessment for industry oriented mini project. However, attending the shadow engineering program is a pre – requisite for evaluating industry – oriented mini project**. Students should submit a report on learning outcomes of the shadow engineering. Every student should attend shadow engineering programming an industry for a week days during second year I or II semester.

vi. There shall be a **Seminar presentation in IV year II Semester**. For the Seminar, the student shall collect the information on a specialized topic other than the project topic and prepare a technical report, showing his understanding of the topic, and submit to the department, which shall be evaluated by a Departmental committee consisting of the Head of the department, Seminar supervisor and a senior faculty member. **The seminar will be awarded 50 marks in which 40 marks will be evaluated for seminar report and 10 marks for MTP Record by the committee.**

vii. There shall be a **Comprehensive Viva-Voce in IV year II Semester**. The Comprehensive Viva-Voce will be conducted by a Committee consisting of the Head of the Department and three Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the student's understanding in various subjects studied during the B.Tech. course of study. The Comprehensive Viva-Voce is evaluated **for 50 marks** by the Committee. There will be **no Midterm assessment for the Comprehensive viva-voce.**

viii. The Project work shall be started by the student in the beginning of the IV year I Semester. Out of a total of **200 marks** for the project work, **60 marks shall be for Midterm Evaluation** and **140 marks for the Semester end Examination**. The viva-voce shall be conducted by a committee comprising of an external examiner, Head of the Department and the project supervisor and one senior faculty. The evaluation of project work shall be conducted at the end of the IV year II Semester. **The Midterm Evaluation shall be on the basis of three Seminars conducted during the IV year II Semester for 30 marks by the committee consisting of Head of the Department,**

project supervisor and senior faculty member of the Department and for 30 marks by the supervisor of the project.

3. Semester end Examination

(a) Theory Courses

Each course is evaluated for 70 marks. Examination is of 3 hours duration.

(b) Practical Courses

Each lab course is evaluated for 70 marks. The examination shall be conducted by the laboratory teacher and another senior teacher concerned with the subject of the same/other department/Industry. One examiner may be appointed by the Chief Superintendent in consultation with HOD as and when required.

(c) Supplementary Examinations

Supplementary examinations will be conducted along with regular Semester end examinations.

(During even Semester regular examinations: supplementary examinations of odd Semester

and during odd Semester regular examinations: supplementary examinations of even Semester will be conducted).

4. Attendance Requirements

i. A student shall be eligible to appear for the Semester end examinations if he acquires a **minimum of 75% of attendance in aggregate of all the subjects** for Semester.

ii. Condonation of shortage of attendance in aggregate **up to 10% (65% and above and below 75%)** in a Semester may be granted by **Institute Academic Committee.**

iii. A student will not be permitted to write the end examination and not promoted to the next Semester unless he satisfies the attendance requirement of the present Semester, as applicable. He may seek re-admission for that Semester when offered next.

iv. Shortage of Attendance **below 65% aggregate in NO case be condoned.**

v. Students whose shortage of attendance is not condoned in any Semester are not eligible to take their end semester examination of that Semester.

vi. A stipulated fee shall be payable towards condonation of shortage of attendance.

5. Minimum Academic Requirements

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item No.**4.**

i. A student shall be deemed to have satisfied 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% (25 out of 70 marks)** of **marks in the end examination and a minimum of 40% of marks in the sum total of the Midterm evaluation and end semester examination taken together.**

ii. A student shall be **promoted from II to III year** only if he fulfils the academic requirement of **37 credits from the following examinations,**

- Two regular and one supplementary examinations of I year I Semester
- One Regular and One Supplementary exam of I year II Semester
- one regular examination of II year I Semester irrespective

iii. A student shall be **promoted from III year to IV year** only if he fulfils the academic requirements of total **62 credits from the following examinations,**

- Three regular and Two supplementary examinations of I B Tech I Semester.
- Two regular and two Supplementary examinations for I B Tech II Semester
- Two regular and one supplementary examinations up to the end of II year I Semester.
- One regular and one supplementary examinations of II year II Semester.
- One regular examination of III year I Semester.

iv. A student shall register and put up minimum academic requirement in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of Cumulative Grade Point Average **(CGPA)**.

v. In addition to the above 200 credits the student must complete the non credit courses also. The non-credit courses awarded with a grade of satisfactory or not satisfactory based on the attendance of the student. Minimum attendance for the non-credit course is 75%.

vi. The student should also register and complete any two value added courses offered by the Institute.

vii. Students who fail to earn 200 credits as indicated in the course structure **within eight academic years** from the year of their admission shall **forfeit their seat** in B.Tech. course and their **admission stands cancelled.**

6. Course pattern

i. The entire course of study is of four academic years. **All the I, II, III and IV years are of Semester pattern .**

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

iii. When a student is detained due to shortage of attendance in any Semester, he may be re-admitted into that Semester when it is offered next, **with the academic regulations of the batch into which he gets readmitted.**

iv. When a student is detained due to lack of credits in any year, he may be eligible to be promoted or for promotion into the next year after fulfillment of the academic requirements, **with the academic regulations of the batch into which he gets admitted**

Award of B.Tech. Degree and Class

A student will be declared eligible for the award of the B. Tech. Degree if he/she fulfils 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) Registered for **200 credits** and secured **200 credits and other Academic Requirements .**

iii) complete the non-credit courses and value added courses as per their course structure.

NOTE: 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.

7. CGPA System:

Method of awarding absolute grades and grade points:
The **absolute grading method** is followed, based on the total marks obtained in internal and external examinations. Grades and grade points are assigned as per the Table given below

B.Tech Program: The Absolute Grading Method is followed, based on the total marks obtained in internal and external examinations. Grades and Grade points are assigned as given below

Marks Obtained	Grade	Description of Grade	Grade Points(GP) Value Per Credit
>=90	O	Outstanding	10.00
>=80 and <89.99	A+	Excellent	9.00
>=70 and <79.99	A	Very Good	8.00
>=60 and <69.99	B	Good	7.00
>=50 and <59.99	C	Fair	6.00
>=40 and <49.99	D	Pass	5.00
<40	F	Remedial	
Not Appeared the Exam(s)	N	Absent	

The student is eligible for the award of the B.Tech degree with the class as mentioned in the Table.

CGPA	CLASS
>= 7.5	First Class with Distinction
>= 6.5 and <7.5	First class
>= 5.5 and < 6.5	Second Class
>=5.0 and < 5.5	Pass class

Calculation of Semester Grade Points Average (SGPA):

The performance of each student at the end of the each semester is indicated in terms of SGPA. The SGPA is calculated as below:

$$SGPA = \frac{Total\ Earned\ Weighted\ Grade\ Points\ for\ that\ Semester}{Total\ Credits\ for\ the\ Semester}$$

$$SGPA = \frac{\sum_{i=1}^{P} Ci * Gi}{\sum_{i=1}^{P} Ci}$$

Where 'Ci' = Number of Credits allotted to particular subject 'I'

'Gi' = Grade Point corresponding to the letter grade awarded in that subject 'i"

'i"= 1,2,…..P represent the number of subjects for that particular semester

* **SGPA is calculated and awarded for the candidates who pass all the courses in a semester.**

Calculation of Cumulative Grade Point Average (CGPA) for Entire Programme.

The CGPA is calculated as below:

Assessment of the overall performance of a student is obtained by calculating Cumulative Grade Point Average (CGPA), which is weighted average of the grade points obtained in all subjects during the course of study.

$$CGPA = \frac{\sum_{i=1}^{m} Ci * Gi}{\sum_{i=1}^{m} Ci}$$

Where Ci= Number of credits allotted to a particular subject 'I"

Gi = Grade Point corresponding to the letter grade awarded in that subject 'i"

I= 1,2,….m represent the number of subjects of the entire program.

Grade lower than D in any subject is not considered for CGPA calculation. The CGPA is awarded only when the student acquires the required number of credits prescribed for the program.

Grade Card

The grade card issued shall contain the following:

a) The credits for each subject offered in that semester
b) The letter grade and grade point awarded in each subject
c) The **SGPA/CGPA**
d) Total number of credits earned by the student up to the end of that semester.
e) Award list indicating the marks awarded to the student.

8. Withholding of Results

If the student has not paid dues to College, or if any case of indiscipline is pending against him, the result of the candidate may be withheld and he will not be allowed to go into the next higher Semester. The award or issue of the Degree may also be withheld in such cases.

9. **Transitry Regulations**

Students who have discontinued or have been detained for want of attendance or any other academic requirements, may be considered for readmission as and when they become eligible. They have to take up Equivalent subjects, as substitute subject in place of repetition of subjects as decided by the Institute Academic Committee.

10. Minimum Instruction Days

The minimum instruction days for each Semester shall be **90 instruction days.**

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

12. The decision of the Institute Academic Committee will be final in respect of equivalent subjects for those students who are transferred from other colleges. The procedure for permitting students to transfer from other colleges will be decided by the principal / Institute Academic Committee keeping the Government Rules in view.

13. 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 the case of any discrepancy/ambiguity/doubt arises in the above rules and regulations, the decision of the Principal shall be final.

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

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

(Applicable for students admitted from the academic year 2013-2014)

(i) A student shall register for all 150 credits and earn all the 150 credits. Marks obtained in all 150 credits shall be considered for the calculation of the class.

(ii) A student who fails to earn 150 credits as indicated in the course structure within **six** academic years from the year of their admission shall forfeit their seat in B.Tech. programme and their admission stands cancelled.

(iii) The same attendance regulations are adopted as that of B.Tech. Four year degree course.

(iv) A student shall be promoted from third year to fourth year only on fulfilling the academic requirements of securing 37 credits from the following examinations.

a. Two regular and one supplementary examination of II year I Semester

b. One regular and one supplementary examination of II year II Semester

c. One regular examination of III year I Semester.

In case of getting detained for want of credits the student may make up the credits through supplementary exams of the above exams before the date of commencement of class work for IV year I Semester.

(v) All other regulations as applicable to B.Tech. four year degree course will hold good for B.Tech. (Lateral Entry Scheme).

15. Malpractice Rules

Disciplinary Action for Malpractices/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	Expulsion from the examination hall and cancellation of the performance in that subject only.

	candidate which can be used as an aid in the subject of the examination)	
	(b)Gives assistance or guidance or receives it from any other candidate orally or by any other body language methods or communicates through cell phones with any candidate or persons in or outside the exam hall in respect of any matter.	Expulsion from the examination hall and cancellation of the performance in that subject only of all the candidates involved. In case of an outsider, he will be handed over to the police and a case is registered against him.
2.	Has copied in the examination hall from any paper, book, programmable calculators, palm computers or any other form of material relevant to the subject of the examination (theory or practical) in which the candidate is appearing.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted to appear for the remaining examinations of the subjects of that Semester/year. The Hall Ticket of the candidate is to be cancelled.
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 end semester 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 the Answer book or	Expulsion from the examination hall

	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.	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 end semester 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-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates are also 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.

	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.	If the student belongs to the college, expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be

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

Malpractices identified by squad or special invigilators

Punishments to the candidates as per the above guidelines.

Malpractice identified at Spot center during valuation

The following procedure is to be followed in the case of malpractice cases detected during valuation, scrutiny etc. at spot center.

1) Malpractice is detected at the spot valuation. The case is to be referred to the malpractice committee. Malpractice committee will meet and discuss/question the candidate and based on the evidences, the committee will recommend suitable action on the candidate.
2) A notice is to be served to the candidate(s) involved through the Principal to his address and to the candidate(s) permanent address regarding the malpractice and seek explanations.
3) The involvement of staff who are in charge of conducting examinations, invigilators valuing examination papers and preparing / keeping records of documents relating to the examinations in such acts (inclusive of providing in correct or misleading information) that infringe upon the course of natural justice to one and all concerned at the examinations shall be viewed seriously and recommended for award of appropriate punishment after thorough enquire.
4) Based on the explanation and recommendation of the committee action may be initiated.

5) Malpractice committee:

i.	Controller of Examinations	Chairman
ii.	Assistant controller of Evaluation	Member
iii.	Chief Examiner of the subject/subject expert	Member
iv.	Concerned Head of the Department	Member

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

I YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
MTH1101	Mathematics – I	3	1	3
MTH1102	Mathematics- II	3	1	3
PHY1101	Engineering Physics	3	1	3
ENG1101	English	3	0	3
CSE1101	Computer Programming	3	0	3
MED1105	Engineering Drawing	2	4	4
ENG1203	English Language Communication Skills Laboratory-I	0	3	2
CSE1201	Computer Programming Laboratory	0	3	2
MED1202	Workshop Practice	0	3	2
Total		**17**	**16**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

I YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
EEE1101	Circuit Theory	4	0	4
MTH1104	Numerical Analysis and Linear Programming	3	1	3
PHY1103	Advanced Engineering Physics	3	1	3
CHE1101	Engineering Chemistry	3	0	3
ITD1102	Data Structures	3	0	3
ECE1101	Electronic Devices and Circuits	3	1	3
ITD1202	Data Structures Laboratory	0	3	2
EPC1201	Engineering Physics / Engineering Chemistry Laboratory	0	3	2
ECE1201	Electronic Devices and Circuits Laboratory	0	3	2
Total		**19**	**12**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

II YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
MTH1103	Mathematics – III	3	1	3
MED1162	Fluid Mechanics and Hydraulic Machines	3	1	3
EEE1102	Electro Magnetic Field Theory	4	1	4
EEE1103	Electrical Machines – I	4	1	4
CED1105	Environmental studies	3	1	3
EEE1104	Network Analysis	4	1	4
NCC1101	Human Values and Professional Ethics	2	**Non Credit Audit Course**	
EEE1201	Electrical Circuits and Simulation Laboratory	0	3	2
MED1212	Fluid Mechanics and Hydraulic Machines Laboratory	0	3	2
Total		**23**	**12**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

II YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
ECE1104	Switching Theory and Logic Design	4	0	4
EEE1105	Control Systems	3	1	3
CMS1101	Business Economics and Financial Analysis	4	0	4
EEE1106	Power Systems-I	3	1	3
ECE1151	Electronic Circuits	3	1	3
EEE1107	Electrical Machines – II	4	1	4
EEE1202	Electrical Machines – I Laboratory	0	3	2
ECE1251	Electronic Circuits Laboratory	0	3	2
Total		**21**	**10**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

III YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
ECE1109	Microprocessors and Micro Controllers	4	1	4
EIE1106	Linear and Digital IC Applications	4	0	4
EEE1108	Power Systems-II	3	1	3
EEE1109	Power Electronics	4	0	4
EEE1110	Electrical Machines – III	4	1	4
ECE1206	Microprocessors and Microcontrollers Laboratory	0	3	2
EEE1203	Electrical Machines –II Laboratory	0	3	2
EEE1204	Control Systems and Simulation Laboratory	0	3	2
Total		**19**	**12**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

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B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

III YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
CMS1102	Management Science	4	0	4
EEE1111	Power Semi Conductor Drives	4	1	4
EEE1112	Electrical Measurements and Instrumentation	3	1	3
EEE1113	Power System Analysis	4	1	4
EEE1114	Switchgear and Protection	4	1	4
NCC1102	Soft Skills and Personality Development	2	**Non Credit Audit Course**	
EEE1205	Electrical Measurements Laboratory	0	3	2
EEE1206	Power Electronics and Simulation Laboratory	0	3	2
ENG1204	Advanced English Language Communication Skills Laboratory	0	3	2
Total		**21**	**13**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

IV YEAR I SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
EEE1115	Power System Operation and control	4	1	4
ECE1157	Principles of Digital Signal Processing	3	1	3
EEE1116	High Voltage Engineering	3	1	3
Elective – I		3	0	3
EEE1128	Modern Power Electronics			
EEE1120	Electrical Machine Design			
EEE1125	Digital Control Systems			
EEE1118	Reliability Engineering and Applications to Power systems			
Elective – II		3	0	3
ITD1105	Object Oriented Programming through JAVA			
CSE 1130	Relational Data Base Management Systems			
MED1164	Elements of Nano Technology			
MED1163	Optimization Techniques			
Elective – III (Open Elective)		3	0	3
ECE 1112	VLSI Design			
EEE1127	Renewable Energy Sources			
EEE1122	Power Plant Instrumentation and Control			
CED1147	Disaster Management			
EEE1207	Power Systems and Simulation Laboratory	0	3	2
ECE1252	Principles of Digital Signal Processing Laboratory	0	3	2
EEE1301	Industry Oriented Mini Project	0	6	2
Total		**19**	**15**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering and Technology

B. TECH ELECTRICAL AND ELECTRONICS ENGINEERING

Regulations- R12

IV YEAR II SEMESTER **COURSE STRUCTURE**

Subject Code	Subject Name	Lectures	*T/P/D	Credits
EEE1123	Utilization of Electrical Energy	3	1	3
Elective – IV		3	0	3
EEE1124	HVDC Transmission System			
EEE1126	EHV AC Transmission			
EEE1121	Special Machines and Control			
EEE1119	Artificial Neural Networks and Fuzzy Logic			
Elective – V		3	0	3
EEE1117	Electrical Distribution Systems			
EEE1129	Flexible A.C. Transmission Systems			
EIE1125	Programmable Logic Controllers			
ECE1124	Embedded Real Time Operating Systems			
EEE1302	Technical Seminar	0	3	2
EEE1303	Comprehensive Viva	0	3	2
EEE1304	Project Work	0	18	12
Total		**09**	**25**	**25**

* T/P/D: Tutorial/Practical/Drawing Practice

VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(MTH1101) MATHEMATICS – I
(Advanced Calculus)

UNIT- I

DIFFERENTIAL CALCULUS

Mean value theorems - Rolle 's Theorem, Lagrange's theorem, Cauchy's theorem, and generalized mean value theorem (Taylor's Theorem) (statements only), Curvature and Radius of curvature, Curve tracing – Cartesian, polar and parametric curves (standard curves only)

UNIT-II

FUNCTIONS OF SEVERAL VARIABLES

Partial differentiation; Euler's theorem, Functional dependence; Jacobian; Maxima and Minima of functions of two variables with constraints and without constraints.

UNIT- III

IMPROPER INTEGRALS AND MULTIPLE INTEGRALS

Improper Integrals; Beta, Gamma, and Error integrals - Properties and simple applications. Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates. Multiple integrals - double and triple integrals, change of variables (Cylindrical and Spherical polar coordinates) and change of order of integration.

UNIT-IV

VECTOR CALCULUS

Introduction to vector and scalar functions; gradient, curl, divergence, and their related properties of sums and products; Laplacian and second order operators; Vector integration - line integral, work done, potential function; Area, surface, and volume integrals; Statements of Vector integral theorems and their verification (without proofs) - Green's theorem, Stoke's theorem, and Gauss divergence theorem.

UNIT- V

ELEMENTARY ANALYSIS

Sequences and series - convergence and divergence, ratio test, comparison test, integral test, Cauchy's root test, Raabe's test (statements only for the tests), and absolute and conditional convergence.

TEXT BOOKS

1. Calculus and Analytic Geometry by Thomas and Finney, Pearson Education, 9th edition.
2. Higher Engineering Mathematics by Dr.B. S. Grewal, Khanna Publishers, 40th edition.
3. Schaum's Outline of Vector Analysis by Murray R. Spiegel, Tata McGraw Hill, 2nd edition.

REFERENCES

4. 1. Elementary Analysis: The Theory of Calculus by Kenneth Ross, Springer
1. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley, 8th edition.

VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(MTH1102) MATHEMATICS – II
(Linear Algebra and Ordinary Differential Equations)

LINEAR ALGEBRA

UNIT- I

SOLUTION OF LINEAR SYSTEMS

Matrices and linear systems of equations - elementary row transformations, Rank, row Echelon form, and normal form; Solution of linear systems - direct methods - LU decomposition, LU decomposition from Gauss elimination, and solution of Tri-diagonal systems by Thomas algorithm; Eigen values, eigen vectors, and their properties - Liner dependence and independence; Cayley-Hamilton theorem (without proof) - inverse and powers of a matrix by Cayley-Hamilton theorem, diagonalization of a matrix, calculation of powers of a matrix; Modal and spectral matrices.

UNIT- II

LINEAR TRANSFORMATIONS

Real matrices - symmetric, skew symmetric, and orthogonal linear transformation; Complex matrices - Hermitian, Skew-Hermitian and unitary matrices; Quadratic forms - reduction of quadratic form to canonical form, rank, positive, negative definite, semi definite, index, signature, Sylvester law, and singular value decomposition.

ORDINARY DIFFERENTIAL EQUATIONS

UNIT- III

ORDINARY DIFFERENTIAL EQUATIONS AND THEIR APPLICATIONS

Differential equations of first order and first degree - Linear, Bernoulli and exact differential equation; Applications of differential equations of first order and first degree - Newton's law of cooling, Law of natural growth and decay, Orthogonal trajectories, and basic circuits.

UNIT- IV

DIFFERENTIAL EQUATIONS OF HIGHER ORDER AND THEIR APPLICATIONS

Differential equations of higher order - homogeneous and non-homogenous type, differential equations of second order and higher order with constant coefficients with right hand side term of the type e^{ax}, sin (ax), cos (ax), polynomials in x, e^{ax} V(x), x V(x), and method of variation of parameters and Euler-Cauchy's 2^{nd} order differential equations, applications to mechanical systems and Simple harmonic motion.

UNIT- V

LAPLACE TRANSFORM AND APPLICATION TO ODE

Laplace transform of standard functions; Inverse transform-first shifting theorem; Dirac's delta function; Convolution theorem; Periodic function; Differentiation and

integration of transforms; Application of Laplace transforms to ordinary differential equations.

TEXT BOOKS

1. Differential Equations, with Applications and Historical Notes by George F. Simmons and John S. Robertson, Tata McGraw Hill, 2008, 2nd Edition.
2. A First Course in Differential Equations by Dennis G. Zill, Brooks Cole.
3. Advanced Engineering Mathematics by Dennis G. Zill, Warren S. Wright, and Michael R. Cullen, Jones & Bartlett Learning, 4th edition.

REFERENCES

1. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley,8th edition.
2. Advanced Engineering Mathematics by Peter V. O'Neil, Cengage Learning, 9th Edition.
3. Elementary Differential Equations and Boundary Value Problems by William E. Boyce and Richard C. Diprima, Wiley.
4. Linear Algebra and its applications by David C Clay, Pearson Education.

VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(Common for all Branches)

(PHY1101) ENGINEERING PHYSICS

UNIT- I

INTERFERENCE

Superposition principle, resultant amplitude, coherence, methods to obtain coherent sources, interference, Young's double slit experiment, interference in thin films by reflection, Newton's rings Experiment

DIFFRACTION-I

Distinguish between Fraunhofer and Fresnel diffraction, diffraction at single slit (Qualitative and Quantitative (Phasors approach)).

UNIT- II

DIFFRACTION-II

Diffraction at double slit, circular aperture, and multiple slits (grating)(Qualitative Approach), Resolution of spectral lines, Rayleigh criterion, and resolving power of grating.

POLARIZATION

Polarization phenomenon, Brewster's Law and Malus law, examples, types of polarization, double refraction, Nicol prism, Quarter and Half wave plates

UNIT- III

LASERS

Characteristics of Lasers – Spontaneous and Stimulated Emission of radiation, meta stable state, population inversion, lasing action, Einstein's coefficients and relation between them –– Ruby Laser – Helium-Neon Laser –Semiconductor Laser – Applications of lasers.

FIBER OPTICS

Principle of optical fiber and properties – Acceptance angle and acceptance cone – Numerical aperture –Types of fibers and refractive index profiles – Qualitative analysis of attenuation in optical fibers –Application of optical fibers.

UNIT- IV

ELEMENTS OF STATISTICAL MECHANICS

Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics (non-mathematical treatment); Photon gas, Planck's law of black body radiation; Deduction of Wien's law and Rayleigh-Jeans law from Plank's law.

PRINCIPLES OF QUANTUM MECHANICS

Waves and particles – De Broglie hypothesis - Matter waves - Davisson and Germer experiment –Heisenberg's uncertainty principle - Schrodinger Wave Equation – Wave function and its Physical Significance - Particle in one dimensional potential box(wave functions, probability densities and energy states).

UNIT- V

FREE ELECTRON FERMI GAS

Energy levels in one dimension, Effect of temperature on the Fermi-Dirac distribution, Free electron gas in three dimensions, electrical conductivity & Ohm's law, Electrical Resistivity of Metals (Qualitative).

BAND THEORY OF SOLIDS

Electron in a periodic potential; Bloch Theorem; Kronig-Penney model (non-mathematical treatment); Origin of energy band formation in solids; Classification of materials into conductors, semiconductors & Insulators; and Concept of effective mass of an electron.

TEXT BOOKS

1. Physics vol.2, by Halliday, Resnick and Krane, John Wiley & Sons
2. Concepts of Modern physics by Arthur Beiser, McGraw Hill Inc.
3. Introduction to Solid State Physics by Charles Kittel, John Wiley & Sons

REFERENCE BOOKS

1. Engineering Physics by R.K.Gaur and S.L.Gupta, Dhanpat Rai and Sons
2. Applied Physics by P.K.Mittal, IK International Publishing House (P) Ltd.
3. Optics by Ghatak and Thyagarajan, Tata Mc Graw
4. Engineering Physics by G Sahashra Buddhe, University Press
5. Elements of Solid State Physics by J.P.Srivatsva, PHI Publishers
6. Engineering Physics by Dr M Chandra Shekar and Dr P. Appala Naidu, VGS Book links.
7. Introduction to Optical Communication by G. Keiser
8. Quantum Mechanics by Gupta Kumar Sharma

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(ENG1101) ENGLISH

INTRODUCTION

This is the age of information and communication technologies. Engineers and technical professionals need to convey technical information in English for various purposes.

Besides learning general English as an international language, engineering students need to be equipped with adequate writing ability so that they can communicate technical information clearly on at least a basic level. A good English writing proficiency can be a contributing factor to professional recognition and career prospects. This course teaches those writing strategies that scientists, engineers, and others will need in order to write successfully on the job. It initiates the students into Technical Writing. The purposes of technical writing are to inform and persuade. This program aims to train students in writing clear, concise and effective English.

This Syllabus is therefore, a Pragmatic English Writing Program for engineering students with intermediate proficiency. The program covers a syllabus outline and instructional approaches on basic writing skills with particular reference to technical writing.

OBJECTIVES

i) To equip the students with all the LSRW skills for advanced writing and speaking.
ii) To equip the students with basic grammar, infrastructural patterns and grammatical constructions required of in technical writing.
iii) To acquaint the students with the writing process, beginning with paragraph writing. This would prepare them for academic and workplace writing.
iv) Equip the students with Oral Communication Skills.

METHODOLOGY

A Task-based, process oriented methodology will be used by the teachers to give a practical orientation to the teaching of language. An inductive approach will be used to demonstrate the use of language in context. This should enable the students to internalize the language structures and vocabulary used in context. Students will be exposed to numerous examples and ample practice will be given in the contextual use of language structures.

SYLLABUS OUTLINE

UNIT - I REVIEW OF GRAMMAR

i) Common Errors
ii) Subject-Verb Agreement
iii) Adverbs
iv) Transitional elements
v) Use of Articles and Prepositions
vi) Conjunctions
vii) pronoun reference

UNIT - II PROSE 1

1. Heaven's Gate by Pico Iyer
2. The Connoisseur by Nergis Dalal

UNIT - III READING AND WRITING SKILLS

i) Reading Comprehension -- Skimmimg & scanning
ii) Reading Comprehension -- Intensive reading
iii) Reading Comprehension -- Critical Analysis
iv) Paragraph Writing
v) Letter Writing
vi) Memo Writing

UNIT - IV PROSE 2

1. The Cuddalore Experience by Anu George
2. The Odds Against Us by Satyajit Ray

UNIT - V ADVANCED WRITING SKILLS

1. Comparison and Contrast Pattern
2. Cause and Effect Pattern
3. Classification
4. Analogy
5. Problem-Solution Pattern

TEXT BOOKS

1. Enjoying Every day English by A. Ramakrishna Rao
2. Effective Technical Communication by Ashraf Rizvi, Tata McGraw-Hill publishing Company, 2005
3. Technical Writing Process and Product by Gerson Sharon J. and Steven Gerson, New Jersey Prentice Hall 1999, 3rd edition.

REFERENCES

1. M. Raman and S. Sharma, 2004; Technical Communication : Principles and Practices, OUP, (Indian Edition)
2. Blanton, L.L. 1993; Composition Practice, Book 4 ,Second Edition, Heinle & Heinle Publishers, pp. 54
3. Georges, T.M. 1996; A course in Analytical Writing for Science and Technology, http://www.mspiggy.etl.noaa.gov/write/
4. Neufeld, J.K. 1987; A Handbook for Technical Communication, Prentice-Hall, Inc. pp.20,65-68
5. Yalden, J. 1987; Principles of Course Design for Language Teaching, Cambridge University Press
6. David F. Beer and David McMurrey Guide to Writing as an Engineer, 2nd ed., Wiley, 2004, ISBN: 0471430749.
7. Greaney, G.L. 1997; Less is More: Summary Writing and Sentence Structure in the Advanced ESL Classroom, The Internet TESL Journal, Vol.III, No.9 http://iteslj.org/Techniques/Greaney-Writing.html
8. M. Raman and S. Sharma, 2004; Technical Communication : Principles and Practices, OUP, (Indian Edition)
9. Blanton, L.L. 1993; Composition Practice, Book 4 ,Second Edition, Heinle & Heinle Publishers, pp. 54
10. `Georges, T.M. 1996; A course in Analytical Writing for Science and Technology, http://www.mspiggy.etl.noaa.gov/write/
11. Neufeld, J.K. 1987; A Handbook for Technical Communication, Prentice-Hall, Inc. pp.20,65-68
12. Yalden, J. 1987; Principles of Course Design for Language Teaching, Cambridge University Press
13. David F. Beer and David McMurrey Guide to Writing as an Engineer, 2nd ed., Wiley, 2004, ISBN: 0471430749.
14. Greaney, G.L. 1997; Less is More: Summary Writing and Sentence Structure in the Advanced ESL Classroom, The Internet TESL Journal, Vol.III, No.9 http://iteslj.org/Techniques/Greaney-Writing.html

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(CSE1101) COMPUTER PROGRAMMING

UNIT- I

Computer fundamentals-Hardware, software, computer language , translators, Program Development steps-Algorithms, Pseudo code, flow charts, Introduction to C Language – History, Simple C Program, Identifiers, Basic data types, user defined data types, Variables, Constants, type qualifiers, Managing Input / Output, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

UNIT - II

Selection Statements – if and switch statements, Repetitive statements – while, for, do-while statements, C Programming examples, other statements related to looping – break, continue, go to, C Programming examples.

Arrays – Basic concepts, one-dimensional arrays, two – dimensional arrays, multidimensional arrays, C programming examples.

UNIT - III

Introduction to Structured Programming, Functions- basics, user defined functions, inter function communication, Standard functions, Storage classes-auto, register, static, extern, scope rules, arrays to functions, recursive functions, example C programs.

Strings – Basic concepts, String Input / Output functions, arrays of strings, string handling functions, strings to functions, C programming examples.

UNIT - IV

Derived types – Structures – Basic concepts, nested structures, arrays of structures, structures and functions, unions, bit fields, C programming examples.

Pointers – Basic concepts, pointers and functions, pointers and strings, pointers and arrays, pointers and structures, self referential structures , example C programs.

UNIT – V

Preprocessor Directives, Dynamic Memory Allocation.

File I/O – Basic concepts, text files and binary files, file input / output operations, file status functions (error handling), C programming examples, Command-Line Arguments.

TEXT BOOKS

1. C programming - A Problem Solving Approach by Behrouz, Forouzan, E.V.Prasad, Richard F.Gilberg, Penguin Books Ltd, 2011.
2. C How to Program by Paul Deitel and Harvey Deitel, PH.
3. Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

REFERENCES

1. Let Us C Yashavant kanetkar, BPB Publications, Revised 12th edition, 2006
2. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie, Prentice Hall, 1978
3. Absolute beginner's guide to C, Greg M. Perry, Sams Pu, 2nd edition, 1994.

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE, EEE, EIE – I Sem	**L**	**T/P/D**	**C**
	2	**4**	**4**

(MED1105) ENGINEERING DRAWING

UNIT – I

Introduction to engineering graphics – construction of ellipse, parabola and hyperbola – cycloidal curves.

UNIT – II

Orthographic projections of points, lines and planes – axis inclined to one planes and inclined to both the planes.

UNIT – III

Orthographic projections of solids:

Cylinder, cone, prism, pyramid and sphere positions and axis inclined to both the planes.

UNIT – IV

Isomeric projections of lines, planes and simple solids.

UNIT – V

Conversion of orthographic views into isometric views and vice-versa.

TEXT BOOKS

1. Engineering Drawing by N.D.Bhatt, Charotar publishing house pvt. Ltd-Anand, 2012.
2. Engineering graphics By K.L. Narayana and P.Kannayya.

REFERENCES

1. Engineering drawing and graphics by Venugopal, New age
2. Engineering drawing by Johle, TMH

VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech ECE, EEE, EIE – I sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(ENG1203) ENGLISH LANGUAGE COMMUNICATION SKILLS LABORATORY

The English language Communication Skills Lab aims to provide practice in all the four skills of LSRW, with a special emphasis on listening and speaking skills.

Syllabus for Lab Sessions

Unit - I

Multimedia Lab

1. Grammar: Nouns and Pronouns; Articles; The Present Tense
2. Vocabulary Lesson 1
3. Listening Comprehension

Communication Skills Lab: Introduction of Self and others

Unit - II

Multimedia Lab

1. Grammar: Concord; Adjectives; The Past Tense
2. Vocabulary Lesson 2
3. Listening Skills

Communication Skills Lab: Seeking and Giving Information, Giving and Taking Instructions

Unit 3

Multimedia Lab

1. Grammar --- adverbs, conjunctions, Prepositions; The Future Tense
2. Vocabulary Lesson 3
3. Telephoning Skills

Communication Skills Lab: Role Play/ Situational Dialogues

Unit 4

Multimedia Lab

1. Grammar ---- Active and Passive Voice; Language Analysis
2. Vocabulary: Lesson 4
3. Listening Comprehension

Communication Skills Lab: **i)** JAM/ Short Talk ii) Information Transfer a) Data Analysis b) Interpretation of Graph

Unit 5

Multimedia Lab :

1. Introduction to Technical Writing

A. Definition of a Technical Term

B. Description of a Mechanism

C. Description of a Technical Process

2. Vocabulary : Lesson 5

Communication Skills Lab : Presentation Skills : Oral Presentation

Multimedia Lab Requirements

The English Language Lab shall have two parts:

i) **The Computer aided Language Lab** for 60 students with 60 systems, one master console,
LAN facility and English language software for self- study by learners.

ii) **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

iv) P – IV Processor

a) Speed – 2.8 GHZ
b) RAM – 512 MB Minimum
c) Hard Disk – 80 GB
v) Headphones of High quality

5. Suggested Software:

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

Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7th 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)

Multimedia Lab Requirements

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- **TOEFL & GRE** (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE,EEE,EIE – I Sem	**L**	**T/P/ D**	**C**
	0	**3**	**2**

(CSE1201) COMPUTER PROGRAMMING LABORATORY

Week 1

a. Basic Linux commands

b. Simple C programs -to implement basic arithmetic operations – sum, average, product, smallest, largest of the numbers, difference, quotient and remainder of given numbers etc.

Week 2

Programs on if, else-if, nested if, else if ladder - largest and smallest of given numbers, to find the grade of a
student based on marks, roots of a quadratic equation etc.

Week 3

a. Programs on switch-case – to check the type of a given character, to find the grade of a student etc.

b. Programs on while and do-while- to find factorial, Fibonacci series, GCD, sin(x), cos(x) series , to check whether a given number is an Armstrong, Palindrome, Perfect, number conversion, and Prime number etc.

Week 4

Programs on for loop- sum of n natural numbers, factorial, sin(x), to generate Pascal's triangle etc.

Week 5

a. Programs on nested loops – check for Fibonacci prime, Pyramids of numbers, generation of prime numbers in the given range, multiplication table etc.

b. programs using break, go to, continue.

Week 6

a. Programs on 1-D array-finding Minimum and maximum element, Sorting and Searching etc.

b. Programs on 2-D array – Sum, product and Multiplication of two Matrices etc.

Week 7

a.Programs on Functions-Implementation of user defined functions categories, passing of arrays to functions etc.

b. Programs on recursion - factorial of a given integer, GCD of two given integers etc.

Week 8

1. Programs on String handling functions-Copying, reverse, substring, concatenation.
2. Programs on structure and unions.

Week 9

Midterm exam

Week 10

Programs using pointers- pointer basic operations, pointers and functions etc

Week 11

Programs on pointers and structures, Pointers and arrays, pointers and strings.

Week 12

Programs on files-Implementation of file handling functions.

Week 13

a. Programs on files error handling.

b. Programs on Dynamic memory allocation

Week 14

Programs on command line arguments.

Week 15

Programs on preprocessor directives

Week 16

Internal Lab Exam

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE,EEE,EIE – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(MED1202) WORKSHOP PRACTICE

(Common to CE, EEE, ECE, EIE, CSE & IT)

(8 + 8 Weeks)

TRADES FOR EXCERCISES

Any eight exercises from the following trades (at least one exercise from each) :

1. Carpentry
2. Fitting
3. Welding
4. Electrical Wiring
5. Lathe Operations

IT WORK SHOP EXCERCISES

Any eight exercises from the following :

1. Computer Hardware: Identification of Peripherals
2. Assembling and disassembling of a PC
3. Simple diagnostic exercises – Related to hardware
4. Installation of Windows Operating System
5. Installation of Linux Operating System
6. Linux Basic Commands
7. Simple diagnostic exercises –Related to Operating System

TEXTBOOKS

1. Work shop Manual - P.Kannaiah/ K.L.Narayana, Scitech Publishers.
2. Workshop Manual by Venkat Reddy.
3. Engineering Workshop Practice – V Ramesh Babu, VRB Publishers Pvt. Ltd.
4. IT Essentials PC Hardware and Software Companion Guide Third Edition by Davis Anfinson and Ken Quamme – CISCO Press, Pearson Education.
5. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft)

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE,EEE,EIE – II Sem	**L**	**T/P/D**	**C**
	4	**0**	**4**

(EEE1101) CIRCUIT THEORY

UNIT–I

INTRODUCTION TO ELECTRICAL CIRCUITS

Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources-Source transformation – Voltage – Current relationship for passive elements (for different input signals-square, ramp, saw tooth, triangular). Kirchhoff's laws – network reduction techniques – series, parallel, series parallel, star-to-delta or delta-to-star transformation.

UNIT–II

MAGNETIC CIRCUITS

Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits

UNIT–III

SINGLE PHASE A.C CIRCUITS

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

UNIT-IV

LOCUS DIAGRAMS AND RESONANCE

Locus diagrams – series R-L, R-C, R-L-C and parallel combination with variation of various parameters – Resonance – series, parallel circuits, concept of band width and Q factor.

UNIT–V

NETWORK TOPOLOGY AND NETWORK THEOREMS

Definitions – Graph – Tree, Basic cutset and Basic Tieset matrices for planar networks – Nodal analysis, Mesh analysis, Super Node and Super Mesh analysis of Networks with Independent and Dependent voltage and current sources - Duality and Dual networks.

Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Tellegen's, Millman's and Compensation theorems for d.c. and a.c. excitations.

TEXT BOOKS

1. Engineering circuit analysis by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th Edition.
2. Network Analysis by A. Sudhakar, Shyammohan Palli, Mc Graw Hill Company,
3. Circuit Theory by A. Chakrabarti, Dhanipat Rai and Co., 6th Edition.

REFERENCES

1. Network Analysis by M. E Van valkenburg, PHI.
2. Linear circuit analysis (time domain phasor, and Laplace transform approaches) by RAYMOND A.DECARLO and PEN-MIN-LIN, Oxford University Press. 2nd Edition, 2004.
3. Network Theory by N.C. Jagan and C.Lakshminarayana, B.S Publications.
4. Electrical Circuit theory by K. Rajeswaran, Pearson Education 2004.
5. Basic Circuit analysis by D.R, Cunningham and J.A Stuller, Jaico Publications.

VNR Vignana Jyothi Institute of Engineering & Technology

I Year B.Tech ECE, EEE, EIE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(MTH1104) NUMERICAL ANALYSIS AND LINEAR PROGRAMMING

NUMERICAL ANALYSIS

UNIT - I

SOLUTIONS OF NON-LINEAR SYSTEMS

Introduction; Mathematical preliminaries; Solution of algebraic and transcendental equations – the bisection method, the method of false position, the iteration method, Newton - Raphson method, and their order of convergence.

UNIT - II

INTERPOLATION

Introduction; Errors in polynomial interpolation; Finite differences; Forward differences; Backward differences; Central differences; Symbolic relations and separation of symbols; Differences of a polynomial; Newton's formulae for interpolation; Central difference interpolation formulae; Gauss's central difference formulae; Lagrange and Hermite interpolation formulae; Cubic spline interpolation.

UNIT - III

NUMERICAL INTEGRATION

Trapezoidal rule, Simpson's 1/3 rule, and Simpson's 3/8 rule.

NUMERICAL SOLUTIONS OF ORDINARY DIFFERENTIAL EQUATIONS

Solution of initial value problems by Taylor's series - Picard's method of successive approximations, Euler's method, and Runge - Kutta methods; Predictor Corrector methods - Adams Moulton method, and Milne's method.

UNIT - IV

NUMERICAL SOLUTIONS OF PARTIAL DIFFERENTIAL EQUATIONS (PDE)

Introduction; Classification of second order PDE; Approximation of derivatives by finite difference method; Solution of Laplace equation - Jacobi's method, Gauss-Seidal (Leibmann's) method, Solution of parabolic equations by explicit and crank Nicolson implicit scheme method; Solution of hyperbolic equations.

UNIT - V

LINEAR PROGRAMMING

linear programming - Basic concepts; -problem formulation, graphical method, canonical and standard forms of LPP simplex method, Artificial variables techniques- M method, Transportation problems: Balanced transportation problem-North-West corner rule, Least cost method, Vogel's approximation method and MODI method.

TEXT BOOKS

1. Elementary Numerical Analysis – an algorithmic approach by Samuel D. Conte and Carl De Boor (2006), Tata McGraw Hill, 3rd edition.
2. Elementary Numerical Analysis by Dr. B.S.Grewal, Khanna Publishers, 4th edition.
3. Operations Research -Theory and Applications by Kanthi Swaroop, MacMillan Publishers India Ltd 4th edition.

REFERENCES

1. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley and Sons, 8th Edition.
2. Advanced Engineering Mathematics by Peter V. O'Neil, Cengage Lear, 9th Edition.

VNR Vignana Jyothi Institute of Engineering and Technology

I Year B.Tech ECE, EEE, EIE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(PHY1103) ADVANCED ENGINNERING PHYSICS

UNIT - I

SEMICONDUCTOR PHYSICS

Fermi level in Intrinsic and Extrinsic semiconductors - Intrinsic semiconductor and carrier concentration – Extrinsic semiconductor and carrier concentration – Equation of continuity – Direct and indirect band gap semiconductors - Hall Effect.

PHYSICS OF SEMICONDUCTOR DEVICES

Formation of p-n junction – open circuit p-n junction – Energy diagram of diode – i/v characteristics of p-n junction diode – p-n diode as a rectifier – Diode equation – Introduction to LED, BJT and FET.

UNIT - II

CRYSTAL STRUCTURES

Space lattice – Unit cell – Lattice parameter – Crystal systems – Bravais lattices Atomic radius – Co-ordination number - Structures and Packing fractions of Simple Cubic – Body Centered Cubic – Face Centered Cubic crystals – Hexagonal closed packed crystals - Structures of diamond, NaCl.

BONDING IN SOLIDS

Force and energy between two approaching atoms, primary and secondary bonds, binding energy and cohesive energy, Madelung constant, cohesive energy and Madelung constant for NaCl crystal

UNIT - III

DIRECTIONS, PLANES AND X-RD

Miller Indices for Crystal planes and directions – Inter planar spacing of orthogonal crystal systems –Diffraction of X-rays by crystal planes and Bragg's law– Laue method – Powder method – Applications of X-ray diffraction

DEFECTS IN SOLIDS

Imperfections in crystals – Point defects (Vacancies, Interstitial and Impurities) Schottky and Frenkel defects – (with mathematical treatment)- Line imperfections – Edge and Screw dislocation – Burger vector – Surface defects and volume defects (Qualitative Treatment).

UNIT - IV

MAGNETIC PROPERTIES OF MATERIALS

Permeability, Field intensity, magnetic field induction, Magnetization and Magnetic susceptibility – Origin of magnetic moment, Bohr magneton – Classification of magnetic materials (Dia, Para and Ferro)- Domain theory of ferromagnetism, Hysteresis curve – Soft and Hard magnetic materials – Ferrites and their applications.

UNIT - V

DIELECTRIC PROPERTIES

Electric dipole, Dipole moment, Dielectric constant, Electronic, Ionic and Orientation Polarization – Calculation of Polarizibilities – Internal fields – Claussius – Mossotti equation –Piezo and Ferro electricity

SUPERCONDUCTORS

Experimental survey and superconductivity phenomenon, – Meissner effect – Critical fields and Persistent currents, Type I and Type II superconductors - London equations-flux quantization-BCS Theory- Josephson Effect, Applications of Superconductors.

TEXT BOOKS

1. Introduction to Solid State Physics by Charles Kittel , Publishers: John Wiley & Sons.
2. Applied Physics by P.K.Mittal, IK International Publishing House (P) Ltd.
3. Electronic Devices and circuits by Milliman, Halkias and satyabratajit, Tata Mcgraw-Hill, 3rd edition.

REFERENCES

1. Solid State Physics by A.J.Dekker; Macmillan Publishers India Ltd.
2. Engineering Physics by Dr M Chandra Shekar and Dr P. Appala Naidu, VGS Book links.
3. Engineering Physics by G Sahashra Buddhe; University Press
4. Elements of Solid State Physics by J.P.Srivatsva, PHI Publishers
5. Engineering Physics by M.R.Srinivasan, New Age Publishers
6. Solid State Physics-Structure & Properties of material by M.A. Wahab, Penguin Books Ltd, 2009.

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I Year B.Tech ECE, EEE, EIE – II sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(CHE1101) ENGINEERING CHEMISTRY

UNIT I

ELECTROCHEMICAL CELLS AND BATTERIES

Conductance-factors effecting conductance, conductometric titrations; cells: types of cells, cell representation, electrode potential; Standard electrode potential; Electrochemical series; Nernst equation; Reference electrodes – hydrogen, calomel electrode; Ion selective electrodes (glass electrode & flouride electrode); Numerical problems.

BATTERIES

Primary and secondary cells (lead-acid cell; Ni-Cd cell; lithium cells); Applications of batteries; Fuel cells – methanol – oxygen fuel cells, advantages of fuel cells; Solar cells - principle, and applications.

UNIT II

CORROSION AND ITS CONTROL

Introduction; Causes and effects of corrosion; Different types of corrosion; Theories of corrosion – chemical, electrochemical corrosion (reactions); Factors affecting corrosion – nature of metal (galvanic series; over voltage; purity of metal; nature of oxide film; nature of corrosion product), and nature of environment (effect of temperature; effect of pH; humidity; effect of oxidant).

Corrosion control methods – cathodic protection, sacrificial anode, and impressed current cathode;

Surface coatings – methods of application on metals (hot dipping; galvanizing; tinning; cladding; electroplating), and organic surface coatings (paints - constituents and functions).

UNIT III

III A) POLYMERS

Introduction**;** Types of polymerization; Plastics - thermoplastic resins, and thermoset resins; Compounding & fabrication of plastics; Preparation, properties, and engineering applications of polyethylene, PVC, PS, Teflon, bakelite, nylon.

III B) RUBBER

Natural rubber- processing, vulcanization; Elastomers (Buna-s; Butyl rubber; Thiokol rubbers); Fiber reinforced plastics (FRP) and their applications.

UNIT IV

WATER

Introduction; Hardness - causes, expression of hardness, units, types of hardness, estimation of temporary & permanent hardness of water, and numerical problems; Boiler troubles – scale & sludge formation, caustic embrittlement, corrosion, priming &

foaming; Softening of water (Internal & external treatment - lime soda, zeolite, ion exchange process, and numerical problems); Reverse osmosis and Electro dialysis (desalination processes).

UNIT V

NANOMATERIALS

Introduction; Preparation and applications of nanomaterials with special reference to carbon nanotubes.

INSULATORS

Classification of insulators; characteristics of thermal & electrical insulators and their applications; Superconductors - Nb-Sn alloy, YBa_2 Cu_3 O_{7-x}; Applications of superconductors.

TEXT BOOKS

1. Text Book of Engineering Chemistry by Y.Bharathi Kumari, Jyotsna Cherukuri, VGS Book Links.
2. Engineering Chemistry by P.C.Jain & Monica Jain, Dhanpatrai Publishing Company.

REFERENCES

1. Text Book of Engineering Chemistry by S.S. Dhara & Mukkant, S.Chand & Co.
2. Engineering Chemistry by O G Palanna, Tata McGraw-Hill Publishing Company, 2009.
3. Text Book of Engineering Chemistry by R.Gopalan, D.Venkappayya, Sulochana Nagarajan, Vikas Publishers.
4. Engineering Chemistry by R.P.Mani, S.N. Mishra, B.Rama Devi, Cengage Learning Publications.

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I Year B.Tech CSE , IT,ECE,EEE,EIE – II Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

(ITD1102) DATA STRUCTURES

UNIT-1

Data Structures – Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, circular linked list implementation, Double linked list implementation, insertion, deletion and searching operations. Applications of linked lists.

UNIT – 2

Stacks-Operations, array and linked representations of stacks, stack applications-infix to postfix conversion, postfix expression evaluation, recursion implementation.

UNIT-3

Queues-operations, array and linked representations. Circular Queue operations, Dequeues, applications of queue.

UNIT-4

Trees – Definitions, Binary tree representation, Binary search tree, binary tree traversals. Graphs – Definitions, Graph representations, Graph traversals.

UNIT-5

Searching and Sorting – Big O Notation, Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort,

Searching-linear and binary search methods.

TEXT BOOKS

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Cengage Learning, Third Edition.
2. Data Structures Using C by Aaron M. Tenenbaum, Prentice Hall, 1st edition.

REFERENCES

1. C& Data structures by P. Padmanabham, B.S. Publications, Third Edition.
2. Data Structures using C by A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI
3. C Programming & Data Structures by E. Balagurusamy, TMH.
4. C Programming & Data Structures by P. Dey, M Ghosh R Thereja, Oxford University Press
5. C& Data structures by E V Prasad and N B Venkateswarlu, S. Chand&Co.

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I Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(ECE1101) ELECTRONIC DEVICES AND CIRCUITS

UNIT I

P-N JUNCTION DIODE AND APPLICATIONS

Review of Semi Conductor Materials, Theory of p-n Junction, p-n Junction as a Diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of V-I characteristic, Ideal and Practical Diode Equivalent Circuits, Static and Dynamic Resistance levels , Transition and Diffusion Capacitances.

The p-n diode as a rectifier, Half wave Rectifier, Full wave rectifier, Bridge Rectifier, Harmonic components in a Rectifier Circuit, Inductor filters, Capacitor filters, L- Section Filters, Π- section filters, Comparison of Regulation Characteristics of different Filters, Breakdown Mechanisms in Semi Conductor Diodes, Zener Diode Characteristics, Shunt Voltage Regulation using Zener Diode.

UNIT II

TRANSISTORS, BIASING AND STABILIZATION

The Bipolar Junction Transistor(BJT), Transistor Current Components, Transistor Construction, BJT Operation, Common Base, Common Emitter and Common Collector Configurations, Limits of Operation, Transistor as an Amplifier, BJT Specifications, Principle of series voltage regulators.

The DC and AC Load lines, Quiescent operating Point, Need for Biasing, Fixed Bias, Collector Feedback Bias, Emitter Feedback Bias, Collector-Emitter Feedback Bias, Voltage Divider Bias, Bias Stability, Stabilization Factors, Stabilization against variations in $V_{BE,}$ β_1 and I_{CO}. Bias Compensation using Diodes, Thermistors and Sensistors, Thermal Runway, Thermal Stability.

UNIT III

SMALL SIGNAL LOW FREQUENCY BJT AMPLIFIERS

Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifiers CE, CC, CB configurations using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of CB, CE, CC configurations in terms of A_I, R_i, A_V, R_O.

UNIT IV

FET, BIASING AND AMPLIFIERS

Construction and operation of Junction Field Effect Transistor (JFET), Volt-Ampere characteristics - Drain and transfer Characteristics, FET as Voltage Variable Resistor, Biasing FET, The JFET Small Signal Model, FET Common Source Amplifier, Common Drain Amplifier, Constructionand operation of MOSFET , MOSFET Characteristics in Enhancement and Depletion modes. Comparison of BJT and FET amplifiers.

UNIT V

SPECIAL PURPOSE ELECTRONIC DEVICES

Principle of Operation and Characteristics of Tunnel Diode (with the help of Energy Band Diagram), Varactor Diode and schotky barrier diode. Principle of Operation and Characteristics of UJT, UJT Relaxation Oscillator. Principle of Operation of SCR, Schockley diode Diac and Triac. Principle of Operation of Semiconductor Photo Diode, PIN Diode ,Photo Transistor ,LED and LCD.

TEXT BOOKS

1. Electronic Devices and Circuits by J.Millman, C.C.Halkias, and Satyabratha Jit, Tata McGraw Hill, 2nd Edition, 2007.
2. Electronic Devices and Circuits by R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 11th Edition, 2006.
3. Electronic Devices and Circuits by David A Bell, Oxford University Press, 5th edition 2008

REFERENCES

1. Integrated Electronics - J.Millman and Christos.C.Halkias, and Satyabratha, Jit Tata McGraw Hill, 2nd Edition, 2008.
2. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th Edition, 2004.
3. Electronic Devices and Circuits- S. S Salivahanan, N. Sursh Kumar, A. Vallava Raju,2nd Edition., TMH, 2010.

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I Year B.Tech CSE, IT, ECE, EEE, EIE – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(ITD1202) DATA STRUCTURES LABORATORY

WEEK1:

1. Write a program for creation, Search and Traversal of Single Linked List
2. Write a program to perform insertion and deletion operations in Single Linked List
3. Write a program to merge two single linked lists

WEEK2:

1. Write a program for creation, Search and Traversal of Circular Linked List
2. Write a program to perform insertion and deletion operations in Circular Linked List

WEEK 3:

1. Write a program for creation, Search and Traversal of Double Linked List
2. Write a program to perform insertion and deletion operations in Double Linked List

WEEK 4:

1. Write a program to implement stack using Arrays
2. Write a program to implement stack using Linked List

WEEK 5:

1. Write a program to convert infix expression to postfix expression using stack
2. Write a program to evaluate postfix expression

WEEK 6:

1. Programs using recursion
2. Write a program to convert infix expression to prefix expression using stack

WEEK 7:

1. Write a program to implement Linear queue using Array
2. Write a program to implement Linear queue using Linked List

WEEK 8:

1. Write a program to implement insertions and deletions in a circular Queue
2. Write a program to perform search and count operations in a circular queue

WEEK 9:

1. Write a program to implement insertions and deletions in a Dequeue
2. Write a program to perform search and count operations in Dequeue

WEEK 10: Midterm Exam

WEEK 11:

1. Write a program to implement Linear search
2. Write a program to implement Binary Search

WEEK 12:

1. Write a program to implement Selection sort
2. Write a program to implement Bubble sort
3. Write a program to implement Insertion sort

WEEK 13:

1. Write a program to implement Merge sort
2. Write a program to implement Quick sort

WEEK 14:

1. Implementation of a binary tree representation using Arrays
2. Write a program to implement tree traversals.

WEEK 15:

1. Implementation of a Graph representation using Adjacency Matrix
2. Write a program to implement graph traversals.

WEEK 16: Final Internal Lab Exam

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I Year B.Tech ECE, EEE, EIE – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EPC1201) ENGINEERING PHYSICS LABORATORY

1. Dispersive Power of the material of a Prism using Spectrometer
2. Diffraction Grating (both with Laser and non-laser source)
3. Single Slit with laser light
4. Newton's Rings
5. Finding thickness of a thin wire or sheet by forming a wedgeshaped film
6. Energy gap of a Semiconductor material
7. Torsional Pendulum Expt. to determine the rigidity modulus of material of a wire
8. Melde's experiment
9. Sonometer Experiment
10. Numerical Aperture and Acceptance angle of an optical fiber cable
11. Stewart Gee's experiment
12. Characteristics of LED.
13. Photo cell/ Solar Cell
14. AC frequency of sonometer method.
15. Attenuation and bending losses in opptical fiber.

Any Eight Experiments are to be conducted

Book: Essential Practical Lab Manual of Physics - P.Raghavendra Rao

(EPC1201) ENGINEERING CHEMISTRY LABORATORY

1. Titrimetry

a) Estimation of hardness of water by EDTA method.

2. Instrumental methods

(i) Conductometry

a) Conductometric titration of strong acid vs strong base

(ii) Colorimetry

a) Estimation of copper by colorimetric method

(iii) pH metry

a) Titration of strong acid vs strong base by pH metry

3. **Physical properties**

a) Determination of viscosity of sample oil by Redwood viscometer.

4. Preparations

a) Preparation of soap

b) Preparation of Nano particles.

TEXT BOOKS

1. Laboratory Manual on Engineering Chemistry by S.K.Bhasin and Sudha Rani; Publisher: Dhanpat Rai.
2. Laboratory Manual on Engineering Chemistry by Y.Bharathi Kumari and Jyotsna Cherukuri; Publisher: VGS Book Links.

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I Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(ECE1201) ELECTRONIC DEVICES AND CIRCUITS LABORATORY

Part A: (Only for viva-voce Examination)

ELECTRONIC WORKSHOP PRACTICE(in 3 lab sessions):

1. Identification, Specification, testing of R,L,C components (color codes), Potentiometers (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Board, PCB's
1. Identification, Specification, testing of Active devices : Diodes, BJT, Low power JFET's, MOSFET's, Power Transistors, LED's, LCD's, SCR, UJT.
2. Study and operation of :
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
   - CRO

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

1. Forward and Reverse Bias V-I characteristics of PN junction Diode.
2. Zener diode V-I characteristics and Zener diode as voltage regulator.
3. Half Wave, and Full wave with and without filters.
4. Characteristics of a BJT under CE configuration and calculation of h-parameters.
5. Characteristics of a BJT under CC configuration and calculation of h-parameters.
6. Characteristics of a BJT under CB configuration and calculation of h-parameters.
7. FET characteristics under CS configuration.
8. Frequency response of CE Amplifier.
9. Frequency response of CC Amplifier.
10. Frequency response of CS FET Amplifier.
11. SCR characteristics.
12. UJT characteristics and Relaxation Oscillator.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(MTH1103) MATHEMATICS – III

UNIT I

PARTIAL DIFFERENTIAL EQUATIONS

Introduction and formation of partial differential equations by elimination of arbitrary constants and arbitrary functions; Solutions of first order linear (Lagrange's) equation and non-linear (standard type) equations; Method of separation of variables for second order equations; Particular integrals; Monge's method for solving Rr+ Ss+ Tt = V

INTEGRAL TRANSFROMS

UNIT II

LAPLACE TRANSFORM

Laplace transform of standard functions; Inverse transform-first shifting theorem; Dirac's delta function; Convolution theorem; Periodic function; Differentiation and integration of transforms; Application of Laplace transforms to ordinary differential equations.

UNIT III

FOURIER SERIES

Determination of Fourier coefficients; Fourier series - even and odd functions; Fourier series in an arbitrary interval; Even and odd periodic continuation; Half range Fourier series sine and cosine expansions; Fourier integral theorem (only statement); Fourier sine and cosine integrals; Fourier transforms; Fourier sine and cosine transforms; Properties; Inverse transforms-finite Fourier transforms.

UNIT IV

APPLICATION OF TRANSFORM (LAPLACE AND FOURIER)

Solutions of wave equation, heat equation and Laplace equation and their use in problems of vibrating string; One dimensional unsteady heat flow; Two dimensional steady heat flow.

UNIT V

Z-TRANSFORM

z-transform; Inverse z-transform; Properties, initial, and final value theorems; Convolution theorem; Difference equations; Solutions of difference equations using z-transform.

TEXT BOOKS

1. Elements of Partial Differential Equations by Ian Naismith Sneddon, Dover Publications, 4th edition.
2. Advanced Engineering Mathematics by Dennis G. Zill and Warren S. Wright, Jones & Bartlett Learning.

REFERENCES

1. Advanced Engineering Mathematics by Erwin Kreyszig, John Wiley, 8th Edition.
2. Advanced Engineering Mathematics by Peter V. O'Neil, Cengage Learning, 9th Edition.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(MED1162) FLUID MECHANICS & HYDRAULIC MACHINES

UNIT - I

FLUID STATICS

Properties of fluid – specific gravity, viscosity surface tension, vapor pressure and their influence on fluid motion, Pressure at a point, measurement of pressure.

FLUID KINEMATICS

Classification of flows, acceleration equations, Streamline, path line and streak lines and stream tube, continuity equation, Stream function, velocity potential function.

UNIT - II

FLUID DYNAMICS

Surface and body forces – Euler's and Bernoulli's equation, Venturimeter, Orifice meter, Pitot tube, Reynolds experiment –Darcy Weisbach equation – Minor losses in pipes – pipes in series and pipes in parallel. Momentum equation.

UNIT - III

BASICS OF TURBO MACHINERY

Hydrodynamic force of jets on flat, inclined and curved vanes - jet striking centrally and at tip, flow over radial vanes.

ELEMENTS OF HYDROELECTRIC POWER STATION

Types of power plants, storage requirements, estimation of power from a given catchment area, head and efficiency.

UNIT - IV

HYDRAULIC TURBINES

Classification of turbines, design of Pelton wheel, Francis turbine and Kaplan turbine – working proportion, work done, efficiency, draft tube-theory, functions and efficiency. Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank and water hammer.

UNIT - V

HYDRAULIC PUMPS

Classification, centrifugal pumps – types, working, work done, manometric head, losses and efficiency, specific speed – pumps in series and parallel – performance characteristic curves, NPSH. Reciprocating Pump – types, Working, Discharge, slip, indicator diagrams.

TEXT BOOK

1. Hydraulics And Fluid Mechanics Including Hydraulics Machines by Dr. P.N.Modi, Dr. S.M. Seth, Standard book house,2009.

REFERENCE BOOKS

1. Fluid Mechanics & Hydraulic Machines by R.K.Rajput, S Chand & Co Ltd, 3rd Rev. Edition, 2006.
2. Fluid mechanics - fundamentals & applications by Yunus A. Çengel, John M.Cimbala, McGraw-Hill Higher Education, 2006
3. Fluid Mechanics and Hydraulic Machines by R.K. Bansal , Lakshmi Publications,2005

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1102) ELECTROMAGNETIC FIELD THEORY

UNIT – I

ELECTROSTATICS

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 – Gauss's law – Application of Gauss's Law – Maxwell's first law, div $\mathbf{D}=\rho_v$ Laplace's and Poisson's equations – Solution of Laplace's equation in one variable.

UNIT – II

CONDUCTORS , DIPOLE, DIELECTRIC & CAPACITANCE

Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behavior of conductors in an electric field – Conductors and Insulators.

Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions, Capacitance – Capacitance of parallel plate and 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 MFI – Maxwell's second Equation, div $\mathbf{B}=0$. 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 $\mathbf{H}=J_c$.

UNIT – IV

FORCE IN MAGNETIC FIELDS AND MAGNETIC POTENTIAL

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 Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson's equations.

Inductor and inductance – Inductance of solenoids, toroids, transmission lines and cables – Mutual inductance – Inductors in series and parallel – energy stored in magnetic field

Introduction to permanent magnets, their characteristics and applications.

UNIT – V

TIME VARYING FIELDS

Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, Curl E = $-\partial B/\partial t$ – Statically and Dynamically induced EMFs – Simple problems -Modification of Maxwell's equations for time varying fields – Displacement current – Poynting Theorem and Poynting vector.

TEXT BOOKS

1. Engineering Electromagnetics by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2006.
2. Electro magnetic Fields" by Sadiku, Oxford Publications

REFERENCES

1. Introduction to Electro Dynamics by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd editon
2. Electromagnetics by J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.
3. Electromagnetic fields, by S. Kamakshaiah, Right Publishers, 2007.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1103) ELECTRICAL MACHINES-I

UNIT-I

ELECTROMECHANICAL ENERGY CONVERSION

Law of energy conservation- Need of Electromechanical energy Conversion-Definition of Generator and Motor-Coupling medium-Role-Electromagnetic machines-Electrostatic machines concept-Energy balance equation of a motor and generator-Singly excited electromagnetic systems-Energy-Coenergy- force expression-Multi excited systems-Torque expression-Problems

UNIT-II

D.C GENERATORS (PART –I)

D.C generator-principle-simple loop generator-Construction-Homo polar and Hetero polar machines-differences-DC Armature Windings-Lap and Wave windings-Development-Differences-Simplex, Duplex and Triplex windings-Emf equation-Classification of D.C. Generators -self excitation-open circuit characteristics-critical resistance and critical speed-problems.

UNIT-III

D.C.GENERATORS (PART –II)

Armature Reaction-Effects-Distribution of Field mmf and Armature mmf-Demagnetising and Cross magnetizing AT/pole-Compensating Windings-Problems-Commutation-Methods of Improving Commutation-Generator Characteristics-Power Stages- Losses-Efficiency-Parallel Operation-Problems

UNIT-IV

D.C.MOTORS (PART –I)

D.C.Motor-Principle-Function of Commutator-Types-Back emf-Voltage Equation-Mechanical Power developed-Condition for maximum mechanical power developed-Torque equation-Motor characteristics-Power stages- Efficiency-Condition for maximum efficiency-problems.

UNIT-V

DC MOTORS (PART –II)

Speed control-Field and Armature control methods - Ward Leonard System-starting of D.C.Motors-3 point and 4 point starters-Design of starter steps-problems-Testing of D.C.Machines: Brake Test-Swin-Burne's Test-Hopkinson's test-Field's Test-Retardation Test-Problems-concept of Electrical Braking [Elementary Treatment only].

TEXT BOOKS

1. Electric Machines by P.S. Bimbra-Khanna publishers
2. Electrical Machines by A.E Fitzgerald, C.kingsely and S.Umans, MGH, 5th edition

REFERENCES

1. Performance and Design of D.C machines by Clayton and Hancock, BPB publishers
2. Electrical machines by I.J Nagrath and D.P Kothari, TMH Publishers, 3rd edition
3. Fundamentals of Electrical machinery by Stephen Chapman, TMH Publishers
4. Electrical machines by Gordon.R.Slemon, Alan straughen, Addison – Wesley.co., 1980, 1st edition

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II Year B.Tech ECE, EEE,EIE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(CED1105) ENVIRONMENTAL STUDIES

UNIT-I

Introduction, Definition, scope and Importance

Ecosystems: Introduction, types, Classification of Eco system, structure and functions of ecosystems.

Bio-diversity and its conservation, Value of bio-diversity Bio-geographical classification of India – India as a mega diversity habitat, Threats to bio-diversity –Hot-spots of Bio Diversity, Conservation of bio-diversity.

UNIT-II

NATURAL RESOURCES

Classification of Resources, Land resources, Land degradation, Soil erosion and desertification, Food resources, Effects of modern agriculture, fertilizer pesticide problems, Food miles, organic farming, Forest resources, Use and over-exploitation, Water resources, Dams –benefits, Conflicts over Water, Energy resources-sustainable Development, and Energy Audit

UNIT III

ENVIRONMENTAL POLLUTION AND ITS CONTROL

Classification of pollution and pollutants, Air pollution, causes ,Effects ,Control measures, ambient air quality standards, water pollution causes , Effects ,Control measures, water and waste water treatment methods, water quality standards, Noise pollution causes ,Effects ,Control measures, land pollution causes ,Effects ,Control measures, solid waste disposal methods ,characteristics of e-waste and management

UNIT IV

GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS

Nuclear hazards, Global warming, Acid rain, hurricanes, Hazardous Waste, Overpopulation , ozone layer depletion, Clean development mechanism , Green computing ,Green Building ,carbon credits, carbon trading

INTERNATIONAL CONVENTIONS/PROTOCOLS

Earth summit, Kyoto protocol and Montreal protocol, Stockholm Declaration

UNIT V

ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

Definition of impact, Classification of Impacts, Prediction of Impacts and Impact assessment Methodologies, Environmental Impact Statement, Environmental Management plan: Technological Solutions

TEXT BOOKS

1. Introduction to Environmental Science by Y.Anjaneyulu, BS Publications
2. Text book of Environmental studies by Deeksha dave, Cengage publishers
3. Text book of Environmental studies by M.Anji Reddy, BS Publications

REFERENCES

1. Text book of Environmental studies by Anuba Kaushik & C P Kaushik, Newage International Pvt.Limited
2. Text book of Environmental studies by S V S Rana, Rastogi Publications
3. Text book of Environmental studies by Dr. K Raghavan Nambiar, Scitech Publishers
4. Environmental studies by Benny Joseph, McGraw-Hill, second Edition.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1104) NETWORK ANAYSIS

UNIT–I

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- Different methods-Problems

UNIT–II

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 - Solution using differential equation approach and Laplace transforms.

UNIT–III

NETWORK FUNCTIONS

The Complex Frequency- concept -Physical interpretation - Transform Impedance and Transform Circuits, Series and parallel Combination of Elements, Terminal Pairs or Ports, Network Functions for One-port and Two-port, Poles and Zeros of Network Functions, Significance of poles and Zeros, Properties of Driving Point Functions, Properties of Transfer functions, Necessary Conditions for Transfer Functions, Time Domain Response from Pole Zero Plot.

UNIT–IV

NETWORK PARAMETERS

Impedance parameters, Admittance parameters, Hybrid parameters, Transmission (ABCD) parameters, conversion of Parameters from one form to other, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations, Image Parameters, Illustrative problems.

UNIT–V

FOURIER ANALYSIS OF A. C. CIRCUITS

The Fourier theorem, consideration of symmetry, exponential form of Fourier series, line spectra and phase angle spectra, Fourier integrals and Fourier transforms, properties of Fourier transforms, Application to Electrical Systems.

TEXT BOOKS

1. Engineering circuit analysis by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
2. Network Analysis by A. Sudhakar, Shyammohan Palli, Mc Graw Hill Company,
3. Circuit Theory by A. Chakrabarti, Dhanipat Rai and Co., 6th edition.
4. Electric circuit analysis by B. Subrahmanyam, I. K international.

REFERENCES

1. Network Analysis by M. E Van valkenburg, PHI.
2. Electric circuit analysis by C. L. Wadhwa, New Age international.
3. Electrical Circuits by David A. Bell, Oxford University press.
4. Basic circuit analysis by D. R, Cunningham and J. A Stuller, Jaico Publications.
5. Electrical Circuit theory by K. Rajeswaran, Pearson Education 2004.
6. Network Theory and Filter Design by Vasudev K. Aatre, Eastern Wiley Publishers, 1993.
7. Electric Circuits by Mahmood Nahvi, Joseph A edmister, Schaum's Outline, Fifth Edition.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	2	**0**	**0**

(NCC1101) HUMAN VALUES AND PROFESSIONAL ETHICS

Course Description

Objectives

To develop the ability to distinguish between what is of value and what is superficial in life.

To develop the ability to face difficult situations in life boldly and resolve them confidently.

To enable students to progress from discrimination to commitment.

To Encourage the students to understand values in life.

Syllabus

1. Self-confidence
2. Peer Pressure-Irregular life style
3. The Power of Self- determination
4. Human relationship—trust and respect- resolving conflict
5. Anger-A sign of helplessness
6. Interaction and ragging
7. Right Utilization of physical facilities
8. Unhappiness -Unfulfilled expectations
9. Setting goals- long term and short term goals-handling responsibilities
10. Dealing with people while coordinating work
11. Coping with stress-Identifying one's interests and strengths
12. Time Management-Planning and aligning with one's goals
13. Skills and Values
14. The role of values in Society

Course Book

The resource material that has been prepared by IIIT can be used apart from material that is available in the websites. Later text books can be identified for the facility of the students.

Evaluation

This course would only have a pass/ fail grade. Participation in discussions, submission of assignments and weekly reports and a final report will be used in evaluation.

Outcome

At the end of the course the students would become sensitive towards human values. They would understand commitment and responsibility. They would be able to bring harmony in the society they live.

TEXT BOOKS

1. Mike Martin and Roland Schinzinger, “Ethics in Engineering”, McGraw -Hill, New York 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, “Engineering Ethics”, Prentice Hall of India, New Delhi, 2004

REFERENCES

1. Charles D. Fleddermann, “Engineering Ethics”, Pearson Education / Prentice Hall, New Jersey, 2004 (Indian Reprint now available).
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics–Concepts and Cases”, Wadsworth Thompson Leatning, United States, 2000 (Indian Reprint now available)
3. John R Boatright, “Ethics and the Conduct of Business”, Pearson Education, New Delhi, 2003.
4. Edmund G Seebauer and Robert L Barry, “Fundamentals of Ethics for Scientists and Engineers”, Oxford University Press, Oxford, 2001.
5. Naagarazan, R.S. ‘A Textbook on Professional Ethics and Human Values’ 2006.

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EEE1201) ELECTRICAL CIRCUITS AND SIMULATION LABORATORY

PART-A

1. Verification of Thevenin's, Norton's and Maximum Power Transfer Theorems
2. Verification of Superposition theorem and RMS value of complex wave
3. Verification of Compensation Theorem
4. Verification of Reciprocity and Millmann's Theorems
5. Locus Diagrams of RL and RC Series Circuits
6. Series and Parallel Resonance
7. Determination of Self, Mutual Inductances and Coefficient of coupling
8. Determination of Z and Y Parameters
9. Determination of Transmission and hybrid parameters
10. Measurement of Active Power for Star and Delta connected balanced loads
11. Measurement of Reactive Power for Star and Delta connected balanced loads
12. Measurement of 3-phase Power by two Wattmeter Method for unbalanced loads

PART-B

1. Simulation of DC Circuits
2. Transient Analysis
3. Mesh and Nodal Analysis
4. Thevinen's Theorem verification
5. Measurement of active Power of three phase circuit for balanced and unbalanced load

   Any Eight experiments from PART-A and any Two from PART-B are to be conducted

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II Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(MED1212) FLUID MECHANICS AND HYDRAULIC MACHINES LABORATORY

1. Verification of Bernoulli theorem
2. Calibration of venturimeter - orifice meter.
3. Calibration of triangles notches.
4. Determination of friction factor for a given pipe line.
5. Determination of Minor losses for the given pipe fittings
6. Impact of jets on vanes.
7. Performance test on Pelton wheel.
8. Performance test on Francis turbine.
9. Performance test on Kaplan turbine.
10. Performance test on single stage centrifugal pump.
11. Performance test on multi stage centrifugal pump.
12. Performance test on reciprocating pump.

Any Ten experiments are to be conducted.

VNR Vignana Jyothi Institute of Engineering and Technology

II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	4	**0**	**4**

(ECE1104) SWITCHING THEORY AND LOGIC DESIGN

UNIT I

NUMBER SYSTEMS & CODES

Philosophy of number systems – complement representation of negative numbers-binary arithmetic-binary codes-error detecting & error correcting codes –hamming codes.

BOOLEAN ALGEBRA

Fundamental postulates of Boolean Algebra - Basic theorems and properties

UNIT II

SWITCHING FUNCTIONS

Canonical and Standard forms-Algebraic simplification , Digital logic gates, properties of XOR gates –universal gates-Multilevel NAND/NOR realizations.

MINIMIZATION OF SWITCHING FUNCTIONS

Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime –Implicant chart, simplification rules.

UNIT III

COMBINATIONAL LOGIC DESIGN

Design using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design using IC chips, MUX Realization of switching functions Parity bit generator, Code-converters, Hazards and hazard free realizations.

PROGRAMMABLE LOGIC DEVICES

Basic PLD's-ROM, PROM, PLA, PLD Realization of Switching functions using PLD's.

UNIT IV

SEQUENTIAL CIRCUITS – I

Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples) Basic flip-flops-Triggering and excitation tables. Steps in synchronous sequential circuit design. Design of modulo-N Ring & Shift counters, Serial binary adder, sequence detector.

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. Introduction to ASM charts, simple examples, system Design using data path and control subsystems, ASM charts for Flip Flops and Binary multiplier.

TEXTBOOKS

1. Switching & Finite Automata theory by Zvi Kohavi, TMH,2nd Edition.
2. Digital Design by Morris Mano, PHI, 3rd Edition, 2006.

REFERENCES

1. An Engineering Approach To Digital Design by Fletcher, PHI. Digital Logic – Application and Design by John M. Yarbrough, Thomson.
2. Fundamentals of Logic Design by Charles H. Roth, Thomson Publications, 5th Edition, 2004.
3. Digital Logic Applications and Design by John M. Yarbrough, Thomson Publications, 2006

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II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(EEE1105) CONTROL 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.

Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems

UNIT II

TRANSFER FUNCTION REPRESENTATION AND TIME RESPONSE ANALYSIS

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.

Feed-Back Characteristics, Effects of feedback, 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 IN S-DOMAIN

The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's 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.

UNIT – IV

FREQUENCY RESPONSE AND STABILITY ANALYSIS IN FREQUENCY DOMAIN

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. Polar Plots-Nyquist Plots-Stability Analysis.

UNIT – V

CLASSICAL CONTROL DESIGN TECHNIQUES AND STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

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 it's Properties – Concepts of 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 son's.,

REFERENCES

1. Modern Control Engineering by Katsuhiko Ogata, Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
3. Control Systems Engineering. by NISE, John wiley, 3rd Edition.
4. Modelling and Control Of Dynamic Systems by Narciso F. Macia George J. Thaler, Thomson Publishers.
5. Modern control system theory by M.Gopal, New age international publishers, Revised second edition.

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II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	4	**0**	**4**

(CMS1101) BUSINESS ECONOMICS AND FINANCIAL ANALYSIS

UNIT - I

BUSINESS AND 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 - II

INTRODUCTION TO BUSINESS ECONOMICS, AND DEMAND ANALYSIS

Definition; Nature and scope of managerial economics - demand analysis determinants; Law of demand and its exceptions.

ELASTICITY OF DEMAND AND DEMAND FORECASTING

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, and judgmental approach to demand forecasting.

UNIT - III

COST ANALYSIS

Cost concepts - opportunity cost, fixed vs. variable costs, explicit costs vs. implicit costs, and out of pocket costs vs. imputed costs; Break-even analysis (BEA) - determination of break-even point (simple problems), managerial significance, and limitations of BEA.

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 - IV

THEORY OF PRODUCTION

Production function - isoquants and isocosts, least cost combination of inputs, and laws of returns; Internal and external economics of scale.

MARKET STRUCTURES

Types of competition; Features of perfect competition, monopoly, and monopolistic competition; Price-output determination in case of perfect competition and monopoly.

PRICING POLICIES AND METHODS

Cost plus pricing; Marginal cost pricing; Sealed bid pricing; Going rate pricing, Limit pricing, Market skimming pricing, Penetration pricing, Two-part pricing, Block pricing, Bundling pricing, Peak load pricing, Cross subsidization.

UNIT – V

INTRODUCTION TO FINANCIAL ACCOUNTING

Double-entry book keeping; Journal; Ledger; Trial balance; Final accounts - trading account, profit and loss account, and balance sheet with simple adjustments.

FINANCIAL ANALYSIS THROUGH RATIOS

Computation; Analysis and interpretation of liquidity ratios - current ratio, and quick ratio; Activity ratios - inventory turnover ratio, and debtor turnover ratio; Capital structure ratios – debt-equity ratio, and interest coverage ratio; Profitability ratios - gross profit ratio, net profit ratio, operating ratio, P/E ratio, and EPs.

TEXT BOOK

1. Managerial Economics and Financial Analysis by Aryasri, Tata McGraw Hill, 2009.
2. Managerial Economics by Varshney & Maheswari, Sultan Chand, 2009

REFERENCES

1. Financial Accounting for Management: An analytical perspective by Ambrish Gupta, Pearson Education, 2010.
2. Managerial Economics by H. Craig Peterson & W. Cris Lewis, Prentice Hall of India.

VNR Vignana Jyothi Institute of Engineering and Technology

II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(EEE1106) POWER SYSTEMS-I

UNIT-I

HYDRO POWER PLANTS

Hydro Power Stations: Choice of site, arrangement of hydroelectric installations, Hydrology, Mass curve, flow duration curve, classification of Hydro Power Plants, pumped storage plants.

UNIT-II

THERMAL POWER STATIONS

Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses - Description of TPS components: Economizers, Boilers, Super heaters, Turbines, Condensers, Electrostatic Precipitators, Chimney, and Cooling towers.

UNIT-III

NUCLEAR AND GAS POWER PLANTS

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 - Brief description of PWR, BWR and FBR.

Gas Power Plants: Principle of Operation and Components (Block Diagram Approach Only).

UNIT-IV

DISTRIBUTION SYSTEMS

Classification of Distribution Systems - Comparison of DC Vs AC Distribution Systems - Requirements and Design features of Distribution Systems-Voltage Drop Calculations in D.C Distribution system for the following cases-Radial system - fed at one end - fed at both the ends for equal and unequal Voltages, Ring Main Distribution system. Voltage Drop Calculations in A.C. Distribution system for the following cases - Power Factors referred to receiving end voltage, with respect to respective load voltages, Numerical problems

UNIT-V

ECONOMIC ASPECTS OF POWER PLANTS

Load curve and Load duration curves-load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems. Desirable Characteristics of a Tariff Method-Tariff Methods: Flat Rate, Block- Rate, two-part, three –part, and power factor tariff methods, effect of load factor, demand and diversity factors on the cost of electrical energy and power factor improvement, Economical Power factor- problems.

TEXT BOOKS

1. Generation and utilization of Electrical Energy – C.L.Wadhawa, New age International (P) Limited, Publishers 1997.
2. Electrical Power Systems by C.L.Wadhawa New age International (P) Limited, Publishers 1997.
3. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti, Dhanpat Rai and Co. Pvt. Ltd, 1999.

REFERENCES

1. Elements of Power Station design and practice by M.V. Deshpande, Wheeler Publishing.
2. Electrical Power Generation, Transmission and Distribution by S.N.Singh., PHI, 2003.
3. Principles of Power Systems by V.K Mehta and Rohit Mehta S.Chand & Company Ltd, New Delhi, 2004.

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II Year B. Tech EEE – II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(ECE1151) ELECTRONIC CIRCUITS

UNIT –I

MULTI STAGE AMPLIFIERS

Multi Stage, Amplifiers Methods of Inter Stage Coupling, n – Stage Cascaded Amplifier, Equivalent Circuits, Miller's Theorem, Frequency Effects, Amplifier Analysis, Transistor Circuits. Cascade – Transistor Configuration, CE-CC Amplifiers (Darlington Pair), Two Stage RC Coupled JFET amplifier (in Common Source configuration), Difference Amplifier.

BJT and FET FREQUENCY RESPONSE

Logarithms- Decibels- General frequency consideration- Low frequency analysis- Low frequency analysis- Low frequency response of BJT amplifiers – Low frequency response of FET amplifier- Miller effect capacitance – High frequency response of BJT amplifier

UNIT – II

FEEDBACK AMPLIFIERS

Concept of feedback, Classification of feedback amplifiers, General characteristics of negative amplifiers, Effect of feedback on Amplifier characteristic- Voltage series- Voltage shunt, current series and Current shunt Feedback configurations- Simple problems

OSCILLATORS

Conditions for oscillations, RC and LC type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz, Hartley and Colpitts Oscillators, RC-Phase shift and wein- bridge oscillators.

UNIT-III

LARGE SIGNAL AMPLIIFERS

Class-A Power Amplifier, Maximum Value of Efficiency of Class-A Amplifier, Transformer coupled amplifier- Push Pull Amplifier- Complimentary Symmetry Circuits (Transformer Less Class B Power Amplifier)-Phase Inverters, Transistor Power Dissipation, Thermal Runway, Heat Sinks.

LINEAR WAVESHAPING

High pass, Low pass RC circuits their response for sinusoidal, step pulse, square and ramp inputs.

UNIT –I V

CLIPPERS AND CLAMPERS

Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, Applications of voltage comparators, clamping operation, clamping circuits using diode with different

inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

SWITCHING CHARACTERISTICS OF DEVICES

Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor- switching times.

UNIT – V

MULTIVIBRATORS

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

TEXT BOOKS

1. Electronic Device and Circuit Theory, Robert L.Boylestad, Louis Nasheisky, 9th Edition 2007, Pearson Education
2. Electronic Devices and Circuits by S.Salivahanan, N.Suresh Kumar and A.Vallavaraj, 2nd edition 2008, Tata McGraw Hill Companies.
3. Solid State Pulse Circuits by David A Bell 4th Edition, Prentice Hall of India.

REFERENCES

1. Introductory Electronic Devices and Circuits(Conventional flow version) – Robert T.Paynter, 7 Edition 2009,PEI.
2. Electronic Devices and Circuits, Anil K.Malin, Varsha Agrawal, Ist Edition,WILEY
3. Pulse, Digital and Switching Waveforms by Jacob Milliman , Harbert Taub and Mothiki S.Prakash rao, 2nd edition 2008, Tata McGraw Hill Companies.

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II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1107) ELECTRICAL MACHINES – II

UNIT – I

TRANSFORMERS (PART-I)

Transformer principle-Need of Transformer-construction-types of transformers-Emf equation-core losses- Ideal Transformer, practical transformer on No-load-phasor diagram- Excitation phenomenon, practical Transformer on load-phasor diagrams-Equivalent circuit - Inrush currents

UNIT – II

TRANSFORMERS (PART-II)

Voltage Regulation-Dependency of voltage Regulation on load power factor-losses-Efficiency-Condition for maximum efficiency- Testing of Transformers- Polarity Test - OC Test-SC Test- Sumpner's Test - Auto transformer- Power and Distribution Transformers differences-All day efficiency.

UNIT – III

PARALLEL OPERATION AND THREE PHASE TRANSFORMERS

Parallel operation – conditions - problems - construction of three phase transformer - Poly-phase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open Δ, Zig-Zag Connections - Third harmonics in phase voltages-three winding transformers- Scott connection - On load tap changer, OFF load tap changer -cooling of a transformer.

UNIT – IV

POLY PHASE INDUCTION MOTORS (PART-I)

Three phase induction motors - construction – Types of rotors – Rotating Magnetic field – Principle of operation – Slip – Rotor frequency – Rotor Equivalent Circuit – Rotor Input – Mechanical Power developed- Complete equivalent circuit –Phasor diagrams at starting and running conditions – Losses and power flow –Efficiency-Torque Equation – Starting and maximum torque – Torque Slip Characteristics – Deep bar and double cage rotors.

UNIT – V

POLY PHASE INDUCTION MOTORS (PART-II)

Circle diagram: No load and Blocked rotor tests-Performance Analysis from circle diagram – starting of Induction motors – Different Starters – Speed control – Control from stator and rotor sides – Crawling and cogging -Induction Generator.

TEXT BOOKS

1. Electrical machines by PS Bhimbra, Khanna Publishers.
2. Electric machinery by A.E. Fritzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition

REFERENCES

1. Performance and Design of AC Machines by MG.Say, BPB Publishers
2. Theory of Alternating Current Machinery by Langsdorf, Tata McGraw-Hill Companies, 2nd edition.
3. Electric Machines by I.J.Nagrath and D.P.Kothari,Tata Mc Graw Hill, 7th Edition.2005
4. Electromechanics-II (transformers and induction motors) by S. Kamakashaiah, Hitech publishers.

VNR Vignana Jyothi Institute of Engineering and Technology

II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EEE1202) ELECTRICAL MACHINES-I LABORATORY

Part - A

1. Magnetization characteristics of DC shunt generator
2. Swinburne's Test on D.C.Shunt Machine
3. Brake test on D.C.Shunt motor
4. Speed control of D.C.Shunt Motor
5. Separation of losses of a D.C. Shunt Machine
6. Load Test on D.C.Shunt Generator
7. Load Test on D.C.Series Generator
8. Hopkinson's Test on a Pair of Identical D.C. Shunt Machines
9. Field's Test on a pair of Identical D.C. Series Machines
10. Open circuit and short circuit tests on single phase Transformer

Part - B

11. Load Test on single phase Transformer
12. Magnetization Characteristics of D.C.Series Generator
13. Retardation Test on D.C.Shunt Motor
14. Load Characteristics' of D.C.Compound Generator
15. Brake Test on D.C.Compound Motor
16. No load and Load Characteristics of Separately Excited D.C.Generator

Any Eight experiments from Part - A and any Two from Part - B are to be conducted

VNR Vignana Jyothi Institute of Engineering and Technology

II Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(ECE1251) ELECTRONIC CIRCUITS LABORATORY

1. CE Amplifier.
2. CC Amplifier.
3. FET Amplifier.
4. Linear wave shaping.
5. Non Linear wave shaping – Clippers.
6. Non Linear wave shaping – Clampers.
7. Transistor as a switch.
8. Study of Logic Gates and Some applications.
9. Study of Flip-Flops and some applications.
10. Astable Multivibrator.
11. Monostable Multivibrator.
12. Bistable Multivibrator.
13. Hartley Oscillator
14. RC phase shift Oscillator using BJT.
15. Current shunt and voltage series feedback amplifier.

Any Ten of the above experiments are to be conducted.

VNR VIGNANA JYOTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

III Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(ECE1109) MICROPROCESSORS AND MICROCONTROLLERS

UNIT I

Introduction to 8085 Microprocessor, Architecture of 8086 Microprocessor, Addressing modes of 8086, Instruction set of 8086, Assembler directives, simple assembly language programs, procedures, and macros. Pin diagram of 8086-Minimum mode and maximum mode of operation.

UNIT II

Memory and I/O organization of 8086, 8255 PPI – various modes of operation and interfacing to 8086, D/A and A/D converter to 8086 using 8255, memory interfacing to 8086.

UNIT III

Serial Communication standards, serial data transfer schemes, 8251 USART architecture and interfacing, RS-232, IEEE 488 standards. Interrupt structure of 8086, Interrupt Vector Table. Need for 8259 Programmable Interrupt Controller.

UNIT IV

Introduction to Microcontrollers, 8051 Microcontroller Architecture, I/O ports, memory organization, counters and Timers, Serial data Input/Output, Interrupts. Addressing modes, Instruction set of 8051, Simple programs.

Timer, serial port and Interrupts programming: Programming 8051 timers/counters, 8051 serial port programming, programming timer interrupts, programming External hardware interrupts, programming serial communication interrupts.

UNIT V

Interfacing to 8051: A/D and D/A Converter, Stepper Motor Interface, Key Board Interfacing, LCD Interfacing.

ARM Processor: Fundamentals, Registers, current program status register, pipeline, Exceptions, Interrupt and the vector table.

. **TEXT BOOKS**

1. Microprocessors and interfacing – Douglas V. Hall, TMH, 2nd Edition, 1999.
2. The 8051 microcontrollers and Embedded systems- Mazidi and mazidi, PHI, 2000.
3. ARM System Developer's Guide: Designing and Optimizing System Software- Andrew N. Sloss, Dominic Symes, Chris Wright, Elsevier Inc., 2007

REFERENCES

1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design – Y.Liu and G.A. Gibson, PHI, 2nd edition.
2. Advanced microprocessors and Peripherals – A.K.Ray and K.M.Bhurchandi, TMH, 2000.
3. Micro Computer System 8086/8088 Family Architecture Programming and Design – By Liu and GA Gibson PHI, 2nd Edition
4. Microcontrollers and Applications, Ajay . V. Deshmukh, TMGH,2005.
5. The 8085 Microprocessor : Architecture Programming and Interfacing – K.Uday Kumar, B.S Umashankar, Pearson , 2008.

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III Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**0**	**4**

(EIE1106) LINEAR AND DIGITAL IC APPLICATIONS

UNIT I

INTEGRATED CIRCUITS

Classification, chip size and circuit complexity, basic information of Op-amp, ideal 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.

OP-AMP APPLICATIONS

Basic application of Op-amp, instrumentation amplifier, ac amplifier, V to I and I to V converters, sample and hold circuits, Log and antilog amplifier, Precision rectifiers, Differentiators, Integrators, Peak Detectors and comparators, sample and hold circuits.

UNIT II

ACTIVE FILTERS and OSCILLATORS

Introduction, 1st order LPF, HPF filters. Band pass, Band reject and all pass filters. Oscillator types and principle of operation – RC and Wien bridge, waveform generators – triangular, square wave and VCO. Comparators.

UNIT III

SPECIAL ICs

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

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

LOGIC FAMILIES

Classification of Integrated circuits, comparision of TTL and CMOS logic families, standard TTL NAND Gate- Analysis and characteristics, TTL open collector O/Ps, Tristate TTL, MOS and CMOS open drain and tristate outputs, CMOS transmission gate, IC interfacing- TTL driving CMOS and CMOS driving TTL .

UNIT V

COMBINATIONAL CIRCUIT DESIGN

Design using TTL-74XX series ICs - Code Converters, Decoders, Demultiplexers, Encoders, priority Encoders, multiplexers and their applications, Priority Generators. Arithmetic circuit ICs-parallel binary Adder/Subtractor circuits using 2's-Complement system. Digital comparator circuits.

SEQUENTIAL CIRCUITS

Commonly available 74XX series ICs-SR, JK, JK Master Slave, D and T Type Flip-Flops & their conversions, Design of Synchronous and Asynchrounous counters, Decade counter, shift registers and applications using TTL-74XX series ICs.

TEXT BOOKS

1. Linear Integrated Circuits by D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2008..
2. Digital Fundamentals by Floyd and Jain, Pearson Education, 8th Edition, 2005.
3. Op-Amps and Linear ICs by Ramakanth A. Gayakwad, PHI, 1987.

REFERENCES

1. Operational Amplifiers and Linear Integrated Circuits by R.F. Coughlin and Fredrick F. Driscoll, PHI, 1977.
2. Operational Amplifiers and Linear Integrated Circuits:4/e William D Stanley PEI 2009.
3. Op Amps and Linear Integrated Circuits: Concepts and Applications by James M. Fiore, Cengage/ Jaico, 2/e, 2009.
4. Operational Amplifiers and Linear Integrated Circuits by K.Lal Kishore - Pearson education, 2008.
5. Modern Digital Electronics RP Jain 4/e TMH 2010.

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III Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(EEE1108) POWER SYSTEMS-II

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 and GMD, symmetrical and asymmetrical conductor configuration with and without transposition - Skin and Proximity effects - 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 TRANSMISSION LINES

Classification of Transmission Lines, Performance of Short, medium lines - Nominal-T, Nominal-Π and A, B, C, D Constants for symmetrical and Asymmetrical Networks - Numerical Problems.

Long Transmission Line-Rigorous Solution, evaluation of A,B,C,D Constants, Representation of Long Lines - Equivalent-T and Equivalent-Π network models-Ferranti effect - Numerical problems.

UNIT – III

POWER SYSTEM TRANSIENTS AND CORONA

Types of System Transients - Travelling wave theory - 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. Bewley's Lattice Diagrams-Numerical Problems.

Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference - Problems.

UNIT-IV

MECHANICAL DESIGN AND OVERHEAD LINE INSULATORS

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.

Types of Insulators, String efficiency and Methods of improvement- Capacitance grading and Static Shielding - Numerical Problems.

UNIT-V

UNDERGROUND CABLES

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

Grading of Cables - Capacitance grading, Description of Inter-sheath grading - Numerical Problems. Comparison of Over Head Lines and Under Ground Cables.

TEXT BOOKS

1. Power System Engineering by I.J.Nagarath and D.P.Kothari, Tata Mc Graw Hill.
2. Electrical power systems by C.L.Wadhwa, New Age International (P) Limited, Publishers,1998.
3. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, S.Bhatnagar, A.Chakrabarthy, Dhanpat Rai and Co Pvt. Ltd.

REFERENCES

1. Power system Analysis-by John J Grainger William D Stevenson, TMC Companies, 4th edition
2. Power System Analysis and Design by B.R.Gupta, Wheeler Publishing.
3. Modern Power system Analysis by I.J.Nagrath and D.P.Kothari: Tata McGraw-Hill Publishing Company, 2nd edition.
4. Power System Analysis by Hadi Saadat, TMH Edition.

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III Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
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(EEE1109) POWER ELECTRONICS

UNIT-I

POWER SEMICONDUCTOR DEVICES

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics

Basic theory of operation of SCR – Static and dynamic characteristics of SCR - Salient points - Two transistor analogy-UJT firing circuit – Series and Parallel connections of SCRs - Snubber circuit details – Specifications and Ratings of SCRs, BJT, MOSFET, IGBT, Numerical problems, natural and forced commutation (Principle only).

UNIT-II

SINGLE PHASE CONTROLLED CONVERTERS

Single Phase Half Controlled Converters: Half controlled converters with R, RL and RLE loads – Derivation of average load voltage and current - without and with free-wheeling Diode – Numerical problems

Single Phase Fully controlled Converters: Mid point and Bridge connections with R, RL and RLE loads- Derivation of average load voltage and current - Performance parameter of single phase full bridge converter, Effect of source inductance – Derivation of load voltage and current- Numerical problems.

UNIT-III

THREE PHASE CONTROLLED CONVERTERS

Three Phase Converters – Three pulse and six pulse converters – Mid point and bridge connections, average load voltage with R and RL loads – Effect of Source inductance – Numerical Problems.

UNIT-IV

AC VOLTAGE CONTROLLERS

Single phase AC voltage controllers with R and RL loads-wave forms – Modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor – Numerical problems

CYCLO CONVERTERS

Cyclo converters – Single phase mid point cyclo converters with Resistive and inductive load (Principle of operation only)-Bridge configuration of single phase cyclo converter (Principle of operation) – Wave forms

Unit -V

CHOPPERS

Time ratio control and Current limit control strategies – Analysis of Buck and Boost converter with continuous mode of operation - Numerical Problems.

INVERTERS

Single phase inverter –half and full bridge inverter – Wave forms—performance parameters of inverters– Voltage control techniques for inverters, Pulse width modulation techniques-single, multiple and sinusoidal PWM Numerical Problems-Three Phase Inverters : analysis of 180 degree and 120 degree modes of operation with resistive, inductive loads - Numerical Problems.

TEXT BOOKS

1. Power Electronics by Mohammed H. Rashid, Pearson Education, Third Edition, First Indian reprint 2004.
2. Power electronics, by P S Bimbhra, Khanna Publishers.
3. Thyristorised Power Controllers by S R Doradla ,A Joshi,R .M K Sinha G K Dubey, New Age Books

REFERENCE BOOKS

1. Fundamentals of Power electronics and Drives by A.Chakrabarti, Dhanpat Rai & Co, 2008
2. Power electronics, by P C Sen, Tata McGraw-Hill Education.
3. Power Electronics by Ned Mohan, Tore M. Undeland and William P. Robbins, John Wiley and Sons, Second Edition.
4. Power Electronics by M D SINGH, K B KANCHANDHANI, Tata McGraw-Hill Publishing Company, second edition, 2006
5. Power Electronics by Vedam Subramanyam, New Age International Pvt Ltd Publishers, Revised Second Edition, 2008

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III Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1110) ELECTRICAL MACHINES – III

UNIT – I

FUNDAMENTALS OF SYNCHRONOUS GENERATORS

Constructional Features of round rotor and salient pole machines – Armature windings – Integral slot and fractional slot windings; Distributed and concentrated windings – distribution, pitch and winding factors – E.M.F Equation. Harmonics in generated e.m.f. – suppression of harmonics – armature reaction - leakage reactance, synchronous reactance and impedance –phasor diagram – load characteristics.

UNIT – II

REGULATION OF SYNCHRONOUS GENERATORS

Regulation by synchronous impedance method, M.M.F. method, Z.P.F. method and A.S.A. methods – salient pole alternators – two reaction analysis – experimental determination of X_d and X_q (Slip test) Phasor diagrams – Regulation of salient pole Alternators.

UNIT – III

PARALLEL OPERATION OF SYNCHRONOUS GENERATORS

Synchronization of Alternators with infinite bus – Methods of Synchronization-synchronizing power and torque –load sharing – Numerical Problems - Effect of change of excitation and mechanical power input. Short circuit Analysis – determination of sub-transient, transient and steady state reactances.

UNIT – IV

SYNCHRONOUS MOTORS

Construction and types of Synchronous Motors – Methods of Starting – Synduction Motor. Variation of current and power factor with excitation control – phasor diagrams – V and Inverted V Curves. Synchronous condenser – Applications - Problems - Mathematical analysis for power developed. Excitation and power circles – hunting and its suppression.

UNIT – V

SINGLE PHASE MOTORS

Single phase induction motor – Double field revolving theory – Elementary idea of cross-field theory – split-phase – Capacitor start – Capacitor run motors - shaded pole motors. Principle and performance of A.C. Series motor-Universal motor – Principle of permanent magnet and reluctance motors. Stepper Motor.

TEXT BOOKS

1. Electric Machines by I.J.Nagrath and D.P.Kothari, Tata Mc Graw Hill Publishers, 7th Edition 2005.
2. Electrical Machines by P.S. Bimbra, Khanna Publishers.

REFERENCE BOOKS

1. The Performance and Design of A.C.Machines by M.G.Say, ELBS and Ptiman and Sons.
2. Electric Machinery by A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw-Hill Companies, 5th edition, 1990.
3. Theory of Alternating Current Machinery by Langsdorf, Tata Mc Graw-Hill, 2nd edition.
4. Fundamentals of Electrical Machines by Stephen Chapman, Tata Mc Graw-Hill Publishers .
5. Electromachanics-III (Synchronous and single phase machines) by S.Kamakashiah, Right Publishers.

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III Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
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(ECE1206) MICROPROCESSORS AND MICROCONTROLLERS LABORATORY

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 / 8051.
7. Interfacing stepper motor to 8086 / 8051.
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.

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III Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
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(EEE1203) ELECTRICAL MACHINES- II LABORATORY

Part – A

1. Sumpner's test on two identical single-phase transformers
2. Separation of iron losses of a single-phase transformer
3. Scott-connected Transformer
4. No-Load and blocked rotor tests on three-phase squirrel-cage Induction Motor
5. Brake test on three phase squirrel cage induction motor
6. Regulation of three-phase Alternator by synchronous impedance method.
7. Regulation of three-phase Alternator by ZPF Method
8. Slip test on three-phase salient pole Alternator
9. **V** and inverted **V** curves of a three-phase synchronous motor
10. speed control of three-phase slip ring Induction Motor

Part - B

11. Regulation of three-phase Alternator by MMF Method
12. Regulation of three-phase Alternator by ASA method
13. Power angle curve and efficiency of three-phase synchronous machine
14. Parallel operation of three-phase Alternator with grid
15. Equivalent circuit and Brake test on Single-phase Induction Motor
16. Sequence impedances of synchronous machines
17. Power factor improvement of three-phase squirrel cage Induction Motor
18. Vector group test and parallel operation of three-phase transformer

Any Eight from Part – A and any Two from Part – B are to be conducted

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III Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
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(EEE1204) CONTROL SYSTEMS AND SIMULATION LABORATORY

Part - A

1. Time response of Second order system including MATLAB Programming and Simulink Model
2. Characteristics of Synchros
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions
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 Controller
10. Characteristics of magnetic amplifiers
11. Characteristics of AC servo motor
12. Stepper Motor characteristics

Part - B

13. (a) MATLAB Simulation of P, PI, PID Controller.
    (b) 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.
16. Design of Lead-Lag compensator for the given system and with specification using MATLAB.

Any Eight experiments from Part – A and any Two experiments from Part – B are to be conducted

REFERENCES

1. Simulation of Electrical and electronics Circuits using PSPICE by M.H.Rashid, M/s PHI Publications.
2. MATLAB and its Tool Box user's manual and – Mathworks, USA.
3. Modern Control Engineering by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

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III Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	4	**0**	**4**

(CMS1102) MANAGEMENT SCIENCE

UNIT - I

INTRODUCTION TO MANAGEMENT

Concepts of management - nature, importance, and functions of management; Taylor's scientific management theory; Fayol's principles of management; Mayo's Hawthorne experiments; Maslow's theory of human needs; Douglas McGregor's theory X and theory Y; Herzberg's two-factor theory of motivation; System and contingency approach to management; Planning – meaning, significance, and types of plans; Decision making and steps in decision making process; Leadership styles; Social responsibilities of management.

Organizing - Meaning, and features; Process of organization; Principles of organization; Elements of organization; Organization chart; Span of control - Graicunas formulae; Centralisation and decentralization; Types of mechanistic and organic structures of organisation - line organization, line and staff organization, functional organization, committee organization, matrix organization, virtual organisation, cellular organisation, team structure, boundaryless organization, inverted pyramid structure, and lean and flat organization structure; Their merits, demerits and suitability.

UNIT - II

HUMAN RESOURCES MANAGEMENT

Concepts of HRM;

Basic functions of HR manager - human resource planning (definition; objectives; process), recruitment (definition; sources; techniques), selection (definition; process), induction and orientation, training and development (definition; need; methods), employee exit process, employee relations management, employee compensation and benefits administration, job evaluation (objectives; process; methods), and performance appraisals (objectives; process; methods).

UNIT - III

STRATEGIC MANAGEMENT

Mission; Goals; Objectives; Policy; Strategy; Programmes; Elements of corporate planning process - environmental scanning; value chain analysis, BCG matrix, generic strategy alternatives, SWOT analysis, and steps in strategy formulation and implementation; Balance score card; Capability maturity model (CMM)/ People capability maturity model (PCMM).

UNIT- IV

OPERATIONS MANAGEMENT

Plant location; Types of plant layout; Methods of production – job, batch, and mass production; Work study-basic procedure involved in method study and work measurement.

MATERIALS MANAGEMENT

Objectives; Need for inventory control; EOQ, ABC Analysis; Purchase procedure; Value analysis; JIT, Six sigma; TQM; Supply chain management; Stores management and stores records.

MARKETING

Functions of marketing; Marketing mix, and marketing strategies based on product life cycle; Channels of distribution.

UNIT - V

PROJECT MANAGEMENT – NETWORK ANALYSIS

Network analysis; Programme evaluation review technique - PERT (probability of completing the project within given time); Critical path method - CPM (Identifying critical path); Project cost analysis; Project crashing; Simple problems.

TEXT BOOK

1. Management Science by Aryasri, Tata McGraw Hill, 2009.
2. Management by James Arthur, Finch Stoner, R. Edward Freeman, and Daniel R. Gilbert 6th Ed, Pearson Education/Prentice Hall.
3. Principles and Practice of Management by L.M. Prasad, Sultan Chand Publications, New Delhi.

REFERENCES

1. Principles of Marketing, A South Asian Perspective by Kotler Philip, Gary Armstrong, Prafulla Y. Agnihotri, and Eshan ul Haque , 2010, 13th Edition, Pearson Education/ Prentice Hall of India.
2. A Handbook of Human Resource Management Practice by Michael Armstrong, 2010, Kogan Page Publishers.
3. Quantitative Techniques in Management by N.D. Vohra, 4th edition, 2010, Tata McGraw Hill.
4. Operations Management: Theory and Practice by B. Mahadevan, 2010, Pearson Education.
5. Strategic Management by V.S.P. Rao and V. Hari Krishna, 2010, Excel Books.

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III Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
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(EEE1111) POWER SEMICONDUCTOR DRIVES

UNIT – I

CONTROL OF DC MOTORS BY SINGLE PHASE AND THREE 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.

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.

UNIT – II

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 single phase and three phase dual converters – Closed loop operation of DC motor (Block Diagram Only)

CONTROL OF DC MOTORS BY CHOPPERS

Single quadrant, Two quadrant and four quadrant chopper fed dc separately excited and series motors – Continuous current operation – Output voltage and current wave forms – Speed and 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 AND STATOR FREQUENCY

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

Variable frequency characteristics-Variable frequency control of induction motor by Voltage source and current source inverter and cyclo converters- 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

ROTOR SIDE CONTROL OF INDUCTION MOTOR

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 and 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 based VSI & CSI.

TEXT BOOKS

1. Fundamentals of Electric Drives by G K Dubey, Narosa Publications.
2. Electric motor drives - modeling, Analysis and control by R.Krishnan, Prentice Hall PTR, 2001
3. Modern Power Electronics and AC Drives by B.K.Bose, PHI.
4. Thyristor Control of Electric drives by Vedam Subramanyam, Tata McGraw Hill Publications.

REFERENCES

1. A First course on Electrical Drives – S K Pillai New Age International (P) Ltd. 2nd Edition.
2. Thyristor DC Drives by P.C.Sen, Wiley-Blackwell, 1981

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III Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
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(EEE1112) ELECTRICAL MEASUREMENTS & INSTRUMENTATION

UNIT-I

MEASURING INSTRUMENTS

Classification of measuring Instruments-Deflecting, Control and Damping Torques-PMMC, Moving iron type instruments-Expression for the deflecting torque and control torque-Extension of range using shunts and series resistance, dynamometer type instruments, single phase energy meter, errors and calibration, Measurement of Power and Energy, three ammeter and three voltmeter methods-Electrostatic Voltmeters

UNIT-II

MEASUREMENT OF RESISTANCE, INDUCTANCE AND CAPACITANCE

Measurement of low, medium and high resistances, insulation resistance measurement, Megger, AC bridges for inductance and capacitance measurement.

UNIT-III

INSTRUMENT TRANSFORMERS

Current and Potential transformers, ratio and phase angle errors, testing, measurement of power using instrument transformers, Potentiometers, AC and DC potentiometers, Calibration of Voltmeters and Ammeters using potentiometers.

UNIT-IV

ELECTRONIC MEASUREMENTS

Electronic voltmeter, multimeter, wattmeter & energy meter. Time, Frequency and phase angle measurements using CRO; Spectrum & Wave analyzer. Digital counter, frequency meter, voltmeter, multimeter and storage oscilloscope.

UNIT-V

INSTRUMENTATION

Transducers, classification & selection of transducers, strain gauges, inductive & capacitive transducers, piezoelectric and Hall-effect transducers, thermisters, thermocouples, photo-diodes & photo-transistors, encoder type digital transducers, signal conditioning and telemetry, basic concepts of smart sensors and application. Data Acquisition Systems.

TEXT BOOKS

1. Electrical and Electronics measurements And Instrumentation by A.K.Sawhney, Dhanpat rai & co publications.
2. Electrical Measurement and Measuring Instruments by Golding, E.W, Sir Issac Pitman and Sons, 1960, 3rd Edition.
3. Modern Electronic Instrumentation and Measurement Techniques by Helfrick Albert D, Cooper William. DPrentice-Hall of India, Reprint 1992.

REFERENCES

1. Instrumentation Measurement and Feedback by Jones, B.E, Tata McGraw-Hill, 1986.

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	4	**1**	**4**

(EEE1113) POWER SYSTEM ANALYSIS

UNIT-I

POWER SYSTEM NETWORK MATRICES

Graph Theory: Basic Concepts-Branch, Link, Incidence Matrix, Bus Impedence Matrix and Admittance Matrix - Numerical Problems. Formation of Z_{Bus}: Partial network, Algorithm for Modification of Z_{Bus} Matrix for addition of an element for the following cases- Addition of an element as a link, Addition of an element as a tree branch, Derivations and Numerical Problems.

UNIT –II

POWER FLOW STUDIES

Introduction, Classification of buses, Formulation of static load flow equations, Solution techniques using Gauss Seidel Method - Algorithm and Flowchart. Numerical problems - Load flow Solution for Simple Power Systems- Determination of Bus quantities, finding Line Flows/Losses for the given Bus Voltages (Computation upto two iterations only and limited to 3 bus power system networks)

Newton Raphson Method in Rectangular and Polar Co-ordinates Form - Load Flow Solution - Algorithm and Flowchart, Numerical Problems.

Principles of Decoupled and Fast Decoupled Methods- Comparison of Different Methods.

UNIT – III

SHORT CIRCUIT ANALYSIS

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, Reactors-Numerical Problems.

Symmetrical Component Theory: Symmetrical Component Transformation, Sequence Networks: Positive, Negative and Zero sequence Networks for transformers, transmission line and synchronous machine, Numerical Problems.

Unsymmetrical Fault Analysis: LG, LL, LLG faults, Interconnection of sequence networks, effect of fault impedance, Numerical Problems.

UNIT –IV

STABILITY ANALYSIS I

Introduction, Concepts of small and large disturbance, Stability: Concept of steady state, Dynamic and Transient Stability. Steady State Stability Limit, Transfer Reactance, Synchronizing Power Coefficient, Power Angle Curve, Determination of Steady State Stability limit and Methods to improve steady state stability, Numerical problems.

UNIT –V

STABILITY ANALYSIS II

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, Numerical analysis.

TEXT BOOKS

1. Elements of Power System by Stevenson, Tata McGraw Hill
2. Computer Techniques in Power System Analysis by M.A.Pai, TMH Publications.
3. Modern Power system Analysis by I.J.Nagrath and D.P.Kothari: Tata McGraw-Hill Publishing Company, 2nd edition.

REFERENCES

1. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill.
2. Power System Analysis by A.R.Bergen, Prentice Hall, Inc.
3. Power System Analysis by Hadi Saadat, TMH Edition.
4. Power System Analysis by B.R.Gupta, Wheeler Publications.

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III Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
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(EEE1114) SWITCH GEAR AND PROTECTION

UNIT – I

CIRCUIT BREAKERS

Circuit Breakers: Elementary principles of arc interruption, Recovery, Restriking Voltage and Recovery voltages. - Restriking Phenomenon, Average and Max. RRRV-Numerical Problems. Current Chopping, Auto reclosures and Resistance Switching - CB ratings and Specifications: Types, testing of circuit breakers - Numerical Problems.

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. Relays Classification: 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 versus Electromagnetic Relays.

UNIT – III

EQUIPMENT PROTECTION

Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection - Numerical Problems.

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

Feeder Protection and Relay coordination

UNIT – IV

NEUTRAL GROUNDING

Grounded and Ungrounded Neutral Systems.- Effects of Ungrounded Neutral on system performance. Methods of Neutral Grounding: Solid, Resistance, Reactance - Arcing Grounds and Grounding Practices.

UNIT – V

PROTECTION AGAINST OVER VOLTAGES

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. Switchgear and Power System Protection by Ravindra P.Singh, PHI, 2009.
2. Switch gear and Protection, by Haroon Asf, Khanna Book Publishing Co.(P)Ltd, 2nd edition.
3. Power System Protection and Switch Gear by Badri Ram and D.N.Vishwakarma, McGraw – Hill professional.
4. Switchgear Protection and Power system by Sunil. S. Rao. Khanna Book Publishing Co.(P)Ltd, 13th Edition.

REFERENCE BOOKS

1. Fundamentals of Power Sytems, Y.G.Paitankar, S.R.Bhinde, PHI Publications, 2nd Edition.
2. Advanced Power System Analysis and Dynamics by L.P.Singh, New Academic Science, 6th Edition

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III Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
	2	**0**	**0**

(NCC1102) Soft Skills and Personality Development

Introduction

In an era of Technological advances and competition in the job market, it is necessary for students to possess soft skills and effective personal skills in addition to technical skills. It is essential that students possess the ability to convey technical ideas in a sound and simple manner. Planning and execution are the two important activities required for them. It is the execution that requires the soft skills as it most of the times deals with people. This course on "Soft Skills and Personality Development" is aimed at enhancing students' career prospects.

This course uncovers the principles of soft skills and personality skills, the ways to integrate them in different phases of career that require personal and interpersonal skills. It focuses on transforming the way of one's thinking and reacting to the environment. It equips the students with self analysis and gain self- control through stress management and conflict management. It also helps students with study skills. It helps students overcome their barriers and achieve excellence in performance and succeed in their chosen field of work.

Objectives

enable students to convert the conceptual understanding of communication into everyday practice

train students to ground concepts/ideas in their own experience

enable students to exercise control over language use

sensitise students to the nuances of the four basic communication skills – Listening, Speaking,

Reading and Writing

enable students to understand the concept and components of personality, so as to apply the

acquired knowledge and march towards excellence in their academic careers.

train students to become aware of their thinking styles and to enable them to convert thinking

into performance

prepare students to evolve mental models for intra-personal and inter-personal transactions

make students reflect and improve their use of body language – posture, gesture, facial expression, tone

sharpen memory skills and other study skills, which are vital for academic excellence.

bring outthe creativity and latent talents of students through goal setting

train students for positive thinking to keep them in good stead at the time of crisis.

SYLLABUS

Unit I: Introduction to Personality Development

1. Definition and Basics of personality
    - Determinants of Personality- biological, psychological and socio-cultural factors
    - Need for personality Development
2. Analyzing strengths and Weaknesses
3. Corporate theories on Personality development
4. Increasing vocabulary
5. Body Language
6. Preparation of Self Introduction
7. Motivation
    - Self-analysis through SWOT
    - Techniques and strategies for self-motivation

Unit II : Techniques in Personality Development Stage I

1. Communication Skills
2. Listening
3. Communication Barriers
4. Overcoming these Barriers
5. Importance of Self Esteem -- Building Self-esteem& Self Confidence
6. Working on attitudes – aggressive, assertive and submissive
7. Goal Setting
8. Leadership and Team Building Skills
9. Group Discussion

Unit III: Techniques in Personality Development Stage II

1. Interpersonal relationships
    - Analysis of ego states, Transactions, Strokes and Life Positions
2. Stress Management
    - Concept, Nature and Dimensions of Stress
    - Causes, Impact and Managing Stress
    - Relaxation Techniques
3. The Power of positive thinking
    - Nurturing creativity, decision-making and problem solving
    - Goals and techniques for positive thinking
    - Enhancement of concentration through positive thinking
4. Projecting a Positive Social Image
    - Grooming & Social Etiquette
    - Voice Modulation
    - Public Speaking

Unit IV: Techniques in Personality Development Stage III

- Conflict Management
- Introduction to Conflict Management
- Levels of Conflict
- Managing Conflict
- Time Management
- Concept
- Importance and Need
- Steps towards better Time Management

Unit V:Memory and Study Skills

- Definition and importance of memory
- Causes of forgetting
- How to forget (thought stopping), how to remember (techniques for improving memory)
- The technique of passing exams-Management of examination fear.

PRACTICAL TRAINING

The course would include the following practical exercises.

- Ice- breaking. Brainstorming and simulation exercises. Thought stopping. Memory and study skills training
- Role play and record work

REFERENCES

1. Mile, D.J (2004). Power of positive thinking. Delhi: Rohan Book Company.
2. Pravesh Kumar (2005). All about self- Motivation. New Delhi: Goodwill Publishing House.
3. Dudley, G.A. (2004). Double your learning power. Delhi: Konark Press. Thomas Publishing Group Ltd.
4. Lorayne, H. (2004). How to develop a super power memory. Delhi: Konark Press. Thomas Publishing Group Ltd.
5. Hurlock, E.B (2006). Personality Development, 28th Reprint. New Delhi: Tata Mc Graw Hill.
6. Windshuttle, Keith and Elizabeth Elliot.1999. Writing, Researching and Communicating: Communication Skills for the Information Age. 3rd Reprint. Tata McGraw-Hill. Australia
7. Dignen, Flinders and Sweeney. English 365. Cambridge University Press
8. Goleman, Daniel. 1998. Working with Emotional Intelligence. Bantam Books. New York
9. Jones, Leo and Richard Alexander. 2003. New International Business English. Cambridge University Press
10. Lucas, Stephen.2001. Art of Public Speaking. Mc-Graw Hill.

11. Tamblyn, Doni and Sharyn Weiss. 2000. The Big Book OF Humorous Training Games. 2004 Edition. Tata McGraw-Hill. New Delhi
12. Personality Development by Rajiv K. Mishra. Rupa & Co.
13. Powell. In Company. Macmillan
14. Cotton, et al. Market Leader. Longman
15. Pease, Allan. 1998. Body Language: How to Read Others Thoughts by their Gestures. Sudha Publications. New Delhi
16. Gardner, Howard. 1993. Multiple Intelligences: The Theory in Practice: A Reader. Basic Books. New York
17. De Bono, Edward. 2000. Six Thinking Hats. 2nd Edition. Penguin Books.
18. De Bono, Edward. 1993. Serious Creativity. Reprint. Harper Business.
19. Mohan, Krishna and Meera Bannerji, 2001, Developing Communication Skills. Macmillan.
20. V. Syamala, 2002. Effective English Communication for you. Emerald Publishers, Chennai.

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

(EEE1205) ELECTRICAL MEASUREMENTS LABORATORY

Part - A

1. Calibration and Testing of single phase energy Meter
2. Measurement of tolerance of batch of low resistances by Kelvin's double bridge
3. Measurement of voltage, current and resistance using dc potentiometer
4. Schering Bridge and Anderson bridge.
5. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.
6. Calibration of LPF wattmeter by Phantom testing
7. Measurement of Iron loss in a bar specimen using Epstein square.
8. Dielectric testing of transformer oil
9. Calibration of dynamometer type power factor meter.
10. Measurement of reactive power using single wattmeter in three-phase circuit.

Part - B

1. B-H loop of single phase transformer and estimation of hysteresis losses
2. Verification of vector groups in three phase transformer
3. Ratio and Polarity test of Single phase transformer.
4. Calibration of MI voltmeter and MI ammeter using RSS (rotary sub-standard) meters
5. Measurement of % ratio error and phase angle of given C.T. by silsbee's method.

Any Eight experiments from Part – A and any Two experiments from Part – B are to be conducted

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

(EEE1206) POWER ELECTRONICS AND SIMULATION LABORATORY

PART A

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Study of UJT gate firing circuit for SCR
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase fully controlled bridge converter with R and RL loads
5. Single Phase Cyclo converter with R and RL loads
6. Single Phase half controlled converter with R load
7. Three Phase half controlled bridge converter with R-load
8. Single Phase Bridge inverter with R and RL loads
9. Single Phase dual converter with RL loads
10. Study of buck converter
11. Study of boost converter

PART B

1. (a)Simulation of single-phase Half wave converter using R and RL loads
   (b)Simulation of single-phase full converter using R, RL and RLE loads
   (c)Simulation of single-phase Semi converter using R, RL and RLE loads
2. (a)Simulation of Single-phase AC voltage controller using R and RL loads
   (b)Simulation of Single phase Cyclo converter with R and RL-loads
3. Simulation of Buck chopper
4. Simulation of single phase Inverter with PWM control
5. Simulation of three phase fully controlled converter with R and RL loads, with and without freewheeling diode. Observation of waveforms for Continuous and Discontinuous modes of operation.
6. Study of PWM techniques

   Any Eight experiments from Part – A and any Two experiments from Part – B are to be conducted

REFERENCES

1. Simulation of Electric and Electronic circuits using PSPICE – by M.H.Rashid, M/s PHI Publications.
2. PSPICE A/D user's manual – Microsim, USA.
3. PSPICE reference guide – Microsim, USA.
4. MATLAB and its Tool Box user's manual and – Mathworks, USA.

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

(ENG1204) ADVANCED ENGLISH COMMUNICATION SKILLS LABORATORY

Introduction

This course aims to offer students a practical approach to Technical Writing, and provide a relevant, contemporary and authoritative introduction to the dynamic field of technical communication that prepares them for Workplace Communication. Each unit in the syllabus is devised so as to include a writing component as well as an oral component.

The objectives of this course are to

i) expose students to workplace writing
ii) initiate them into the Process of Technical Communication
iii) enable the students to create clear, accurate, and succinct content
iv) enable students to produce documents reflecting different types of technical communication such as Abstracts, Proposals and Technical Reports through ample practice
v) enable students to adjust technical content to meet the needs of a specific target audience
vi) groom students in behavioral skills

Methodology

Written Communication Component

A Process- Genre methodology will be used in teaching the technical genres. This method would enable students to understand the use of particular lexico-grammatical patterns required of in the context of technical writing. They would learn to use language to express the particular communicative intent that is required of in the context of writing these genres.

Objectives of Writing Component

i) enable students to write clearly and succintly
ii) equip students with the ability to write technical genres

Oral Communication Component

The objective of including Oral Communication is to impart behavioral skills and prepare students to speak to a large group or team, keeping in mind the audience, context and purpose of communication. This Oral Communication component must enable students to speak in an organized and mature way, without any inhibitions. They will be groomed to relate their speech to their audience.

Objectives of Oral Communication Component

i) equip students with Behavioral skills
ii) prepare them for Oral presentations, and Group Discussions
iii) equip them with Interview skills

Syllabus Outline

Unit I

Writing Skills 1

1. Applications and Covering letters
2. Resume Writing
3. Verbal Ability
4. **Oral Communication** :Talking About Yourself

Unit II

1. Writing an SOP
2. Summarizing and Synthesizing Information
3. Oral Communication: Making Presentations

Unit III

1. Writing Project Proposals
2. Oral Communication: Group Discussions

Unit IV

1. Writing Project Reports
2. Oral Communication: Interview Skills

Unit V.

Behavioral Skills and Personality Development

1. Building a positive attitude, building a positive personality, Motivation, goal setting & values & vision
2. Problem Solving and Decision Making; Negotiation Skills through Role Play
3. Team Building and Leadership Abilities
4. Social Etiquette

REQUIRED TEXT AND MATERIALS

1. Ashraf Rizvi, M (2005). Effective Technical Communication, Tata Mc Graw Hill Publishing Company Limited, New Delhi.
2. Anderson, Paul V. (2003). Reports. In Paul V. Anderson's Technical Communication: A Reader-Centered Approach (5th ed..) (pp. 457-473). Boston: Heinle.
3. William S. Pfeiffer, (2010) Technical Communication: A Practical Approach (7th ed.). Prentice Hall

References

1. Burnett, Rebecca. Technical Communication. 5th Ed., Heinle, 2001
2. Bolter, Jay David. (2001). The late age of print. In Robert P. Yagelski's (Ed.) Literacies and
   Technologies: A Reader for Contemporary Writers (135-145). New York: Longman.
3. Brandt, Deborah. (1998). Sponsors of literacy. College Composition and Communication 49.2, 165-185.
4. Gerson Sharon J. and Steven Gerson : Technical Writing Process and Product. 3rd edition, New Jersey: Prentice Hall 1999
5. Johnson-Sheehan, Richard. (2007). Starting Your Career. In Richard Johnson-Sheehan's Technical Communication Today (2nd ed.) (pp. 388-402). New York: Longman.
6. Markel, Mike**.** Technical Communication: Situations and Strategies (8th EDITION (2006-2007)
7. R. C. Sharma and K. Mohan, Business Correspondence and Report Writing, Third Edition, TMH, 2002. (Indian Edition)
8. M. Raman and S. Sharma, Technical Communication : Principles and Practices, OUP, 2004. (Indian Edition)

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
	4	**1**	**4**

(EEE1115) POWER SYSTEM OPERATION AND CONTROL

UNIT – I

ECONOMIC OPERATION OF POWER SYSTEMS

Optimal operation of Generators in Thermal Power Stations, - heat rate Curve – Cost Curve – Incremental fuel and Production costs, input-output characteristics, Optimum generation allocation with line losses neglected, Unit commitment.

Optimum generation allocation including the effect of transmission line losses – Loss Coefficients, General transmission line loss formula.

UNIT – II

HYDROTHERMAL SCHEDULING

Optimal scheduling of Hydrothermal System: Hydroelectric power plant models, Scheduling problems-Short term hydrothermal scheduling problem.

MODELLING OF TURBINE

Modelling of Turbine: First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models.

UNIT – III

MODELING OF GENERATOR AND AUTOMATIC CONTROLLERS

Modelling of Generator (Steady State and Transient Models): Classical model of Synchronous Machine, Description of Swing Equation (No Derivation) and State-Space second order model of Synchronous Machine.

Modelling of Governor: Mathematical Modelling of Speed Governing System – Derivation of small signal transfer function.

Modelling of Excitation System: Fundamental Characteristics of an Excitation system, Transfer function, Block Diagram Representation of IEEE Type-1 Model.

UNIT –IV

SINGLE AREA LOAD FREQUENCY CONTROL

Necessity of keeping frequency constant. Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case.

TWO-AREA LOAD FREQUENCY CONTROL

Load frequency control of 2-area system – uncontrolled case and controlled case, tie-line bias control. Proportional plus Integral control of single area and its block diagram representation, steady state response –Automatic Generation Control and Economic dispatch control.

UNIT – V

REACTIVE POWER CONTROL

Overview of Reactive Power control – Reactive Power compensation in transmission systems – advantages and disadvantages of different types of compensating equipment for transmission systems; load compensation – Specifications of load compensator, Uncompensated and compensated transmission lines: shunt and Series Compensation.

TEXT BOOKS

1. Electrical Power Systems by C.L.Wadhwa, Newage International-3rd Edition
2. Modern Power System Analysis – by I.J.Nagrath and D.P.Kothari Tata M Graw – Hill Publishing Company Ltd, 2nd edition.
3. Electric Energy systems Theory – by O.I.Elgerd, Tata Mc Graw-hill Publishing Company Ltd., Second edition.
4. Operation and Control in Power Systems by P.S.R.Murthy, BS Publications, 2011, Second edition

REFERENCE BOOKS:

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

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(ECE1157) PRINCIPLES OF DIGITAL SIGNAL PROCESSING

UNIT-I

INTRODUCTION

Classification of continuous time Signals & Systems. Linear shift invariant systems, stability and causality, Sampling of Continuous signals- Introduction to digital signal processing-Sampling process-Sampling theorem.

Classification of discrete time signals and sequences

UNIT – II

FOURIER ANALYSIS

Introduction to Discrete Fourier series, Discrete Fourier Transform: Properties of Discrete Fourier Transform, linear convolution and circular convolution of sequences using DFT, Computation of DFT, Relation between DFT and Z-Transform.

Fast Fourier transform: Radix -2 decimation in time and decimation in frequency FFT algorithms, Inverse FFT.

UNIT – III

Z- TRANSFORM

Introduction to Z-transform, Properties of Z- Transform, Inverse Z- Transform, Application of Z- Transforms for Linear constant coefficient difference equations, Realization of Digital filters, system function – stability criterion.

UNIT – IV

IIR FILTERS

Analog filter approximations-Design of Butterworth Chebyshev filters, Design of IIR digital filter from analog filter using- impulse invariant and bilinear transformation techniques, design examples, realization of IIR filters-direct, canonic, cascade, and parallel forms.

UNIT – V

FIR FILTERS

Characteristics of FIR Digital Filters, Frequency response, Design of FIR filters using – Rectangular, Hamming, Bartlett- windows , frequency sampling technique, comparison of FIR and IIR filters, realization of IIR filters-direct, cascade forms. Architecture and features of TMS 320F 2407, Applications of DSP.

TEXT BOOKS

1. Digital signal processing: principles, algorithms and applications-John G.Proakis, D.G.Manolakis, 3rd edition, PHI-2007.
2. Discrete time signal processing-A.V.Oppenheim and R.W.Schaffer,PHI,2009.
3. TMS 320F 24xx Manuals

REFERENCES

1. Digital signal processing-Fundamentals and applications-LiTan, Elsevier,2008.
2. Fundamentals of digital signal processing using MATLAB-Robert J.Schilling, Sandra L.Harris, Thomson, 2007.
3. Digital signal processing-S.Salivahanan, A.Vallavaraj, C.Gnanapriya, TMH, 2009.
4. Discrete systems and digital signal processing with MATLAB-Taan S.ElAli,CRC Press,2009.
5. P Venkata Ramani, M.Bhaskar, “Digital Signal Processor; Architecture, Programming & Application”, TataMcGrawHill-2001

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(EEE1116) HIGH VOLTAGE ENGINEERING

UNIT- I

INTRODUCTION TO HIGH VOLTAGE TECHNOLOGY AND APPLICATIONS

Electric Field Stresses, Gas / Vaccum 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, LIQUID AND SOLID 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.

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.

UNIT- IV

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. Measurement of D.C Resistivity, Measurement of Dielectric Constant and loss factor, Partial discharge measurements

UNIT- V

OVER VOLTAGE PHENOMENON AND TESTING OF ELECTRICAL APPARATUS

Natural causes for over voltages – Lightning phenomenon, Over voltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems. Testing of Insulators and bushings, Testing of Isolators and circuit breakers, Testing of cables, Testing of Transformers, Testing of Surge Arresters, Radio Interference measurements.

TEXT BOOKS

1. High Voltage Engineering by M.S.Naidu and V. Kamaraju – TMH Publications, 3rd Edition.
2. High Voltage Engineering: Fundamentals by E.Kuffel, W.S.Zaengl, J.Kuffel by Elsevier, 2nd Edition.

REFERENCE BOOKS

1. High Voltage Engineering by C.L.Wadhwa, New Age Internationals (P) Limited, 1997.
2. High Voltage Insulation Engineering by Ravindra Arora, Wolfgang Mosch, New Age International (P) Limited, 1995.
3. Extra High Voltage A.C. Transmission Engineering by Rakosh Das Begamudre, New Age International, 2007, Revised Edition

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IV Year B.Tech EEE –I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

Elective-I

(EEE1128) MODERN POWER ELECTRONICS

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) – symbol, structure and equivalent circuit – comparison of their features.

UNIT-II

TWO-LEVEL VOLTAGE SOURCE INVERTER

Introduction, Sinusoidal PWM, Modulation Scheme, Harmonic Content, Overmodulation, Third Harmonic Injection PWM, Space Vector Modulation, Switching States, Space Vectors, Dwell Time Calculation, Modulation Index, Switching Sequence, Spectrum Analysis, Even-Order Harmonic Elimination, Discontinuous Space Vector Modulation.

UNIT- III

MULTILEVEL INVERTERS

Need for multilevel inverters, multilevel concept, Classification of multilevel inverters – Diode clamped Multilevel inverter- Principle of operation – main features - Flying capacitor multilevel inverter – principle of operation – main features, Cascaded Multilevel Inverter, Principle of operation- features, Applications of multilevel inverters.

UNIT-IV

DC-DC SWITCH-MODE CONVERTERS AND SWITCHING DC POWER SUPPLIES

Linear power supplies, overview of switching power supplies, dc-dc converters with electrical isolation, control of switch mode dc power supplies, power supply protection, and electrical isolation in the feedback loop, designing to meet the power supply specifications.

Control of dc-dc converter, Fly Back, Forward, Full-bridge dc-dc converter.

UNIT-V

RESONANT CONVERTERS

Introduction to Resonant Converters, Classification of Resonant Converters, Basic Resonant circuit concepts, series resonant circuit-parallel resonance circuit, resonant switch converters: ZCS resonant buck converter, ZVS resonant boost converter

TEXT BOOKS

1. Power electronics circuits, Devices and applications by M.H. Rashid PHI –I edition –1995.
2. Power Electronics converters, Applications and Design by Ned Mohan, Tore M. Undeland and William P. Robbins, A John Wiley Sons, Inc., Publication 3rd Edition.

REFERENCES

1. High-Power Converters and AC Drives by Bin Wu, A John Wiley & Sons, Inc., Publication
   Switch mode Power Supply Handbook 3/e, Keith Billings, Taylor Morey, Mc GrawHill.
2. Fundamentals of Power Electronics by Robert W. Erickson , Dragan Maksimovic, KLUWER ACADEMIC PUBLISHERS 2nd Edition.
3. Pulse-width Modulated DC–DC Power Converters by Marian K. Kazimierczuk, John Wiley and Sons, Ltd, Publication

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IV Year B.Tech EEE –I Sem	**L**	**T/P/D**	**C**
Elective-I	**3**	**0**	**3**

(EEE1120) ELECTRICAL MACHINE DESIGN

UNIT - 1

PRINCIPLES OF ELECTRICAL MACHINE DESIGN

Introduction, considerations for the design of electrical machines, limitations. Different types of materials and insulators used in electrical machines.

UNIT - 2

DESIGN OF DC MACHINES

Output equation, choice of specific loadings and choice of number of poles, design of Main dimensions of the DC machines, Design of armature slot dimensions, commutators and brushes, magnetic circuit - estimation of ampere turns, design of yoke and pole, field windings – shunt, series and inter poles.

UNIT - 3

DESIGN OF TRANSFORMERS

(Single phase and three phase)**:** Output equation for single phase and three phase transformer, choice of specific loadings, expression for volts/turn, determination of main dimensions of the core, types of windings and estimation of number of turns and cross sectional area of Primary and secondary coils, estimation of no load current, expression for leakage reactance and voltage regulation. Design of tank and cooling tubes (round and rectangular).

UNIT - 4

DESIGN OF INDUCTION MOTORS

Output equation, Choice of specific loadings, main dimensions of three phase induction motor, Stator winding design, choice of length of the air gap, estimation of number of slots for the squirrel cage rotor, design of Rotor bars and end ring, design of Slip ring induction motor, estimation of No load current, leakage reactance, and circle diagram.

UNIT -5

DESIGN OF SYNCHRONOUS MACHINES

Output equation, Choice of specific loadings, short circuit ratio, design of main dimensions, armature slots and windings, slot details for the stator of salient and non salient pole synchronous machines. Design of rotor of salient pole synchronous machines, magnetic circuits, dimensions of the pole body, design of the field winding, and design of rotor of non-salient pole machine.

TEXT BOOKS

1. A Course in Electrical Machine Design- A.K.Sawhney, Dhanpat Rai & Sons.
2. Design of Electrical Machines- V. N. Mittle- 4/e edition, Standard Publishers Distributors.

REFERENCE BOOKS

1. Performance and Design of AC Machines- M.G.Say, CBS Publishers & Distributors.
2. Principles of Electrical Machine Design- R.K.Aggarwal, CBS Publishers.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

Elective-III

(EEE1125) DIGITAL CONTROL SYSTEMS

Unit – I

SAMPLING AND RECONSTRUCTION

Introduction, sample and hold operations, sampling theorem, Reconstruction of original sampled signal to continuous –time signal.

THE Z – TRANSFORMS

Introduction, Linear difference equations, pulse response, Z – transforms, Theorems of Z – Transforms, the inverse Z – transforms, Modified Z- Transforms

Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM

Z-Transform method for solving difference equations; Pulse transfer function, Pulse transfer function of closed loop system block diagram analysis of sampled – data systems, mapping between s-plane and z-plane: primary strips and complementary strips.

UNIT – II

STATE SPACE ANALYSIS

State Space Representation of discrete time systems, Pulse Transfer Function Matrix solving discrete time state space equations, State transition matrix and it's Properties, Methods for Computation of State Transition Matrix, Discretization of continuous time state – space equations

CONTROLLABILITY AND OBSERVABILITY

Concepts of Controllability and Observability, Tests for controllability and Observability. Duality between Controllability and Observability, Controllability and Observability conditions for Pulse Transfer Function

UNIT – III

STABILITY ANALYSIS

Stability Analysis of closed loop systems in the Z-Plane. Jury stablility test – Stability Analysis by use of the Bilinear Transformation and Routh Stability criterion. Stability analysis using Liapunov theorems.

UNIT – IV

DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS

Design based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers. Design of digital control through deadbeat response method.

UNIT – V

STATE FEEDBACK CONTROLLERS AND OBSERVERS

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.

State Observers – Full order and Reduced order observers.

LINEAR QUADRATIC REGULATORS

Introduction to adaptive controls,Min/Max principle**,** Linear Quadratic Regulators,Kalman, state estimation through Kalman filter.

TEXT BOOKS

1. Discrete-Time Control systems - K. Ogata, Pearson Education/PHI, 2nd Edition
2. Digital Control and State Variable Methods by M.Gopal, TMH

REFERENCE BOOKS

1. Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.
2. Digital Control Engineering, M.Gopal, New age international publishers

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
	3	**0**	**3**

Elective-I

(EEE1118) RELIABILITY ENGINEERING AND APPLICATIONS TO POWER SYSTEMS

UNIT – I

BASICS OF PROBABILITY THEORY AND DISTRIBUTION

Concepts of Reliability, Unreliability, Availability, Unavailability–Rules for combining probabilities of events – Bernoulli's trials – probability density and distribution functions – binomial distribution – expected value and standard deviation of binomial distribution.

UNIT – II

NETWORK MODELLING AND RELIABILITY ANALYSIS

Analysis of Series, Parallel, Series-Parallel networks, complex networks: decomposition method, Path based and Cutset based approaches.

RELIABILITY FUNCTIONS

Reliability functions f(t), F(t), R(t), h(t) and their relationships – Bath tub curve - exponential distribution – Expected value and standard deviation of exponential distribution –reliability analysis of series, parallel networks using exponential distribution – reliability measures: MTTF, MTTR and MTBF.

UNIT – III

MARKOV MODELLING

Discrete Markov chains: General modeling concepts-concept of stochastic transitional probability Matrix, Evaluation of limiting state Probabilities, Continuous Markov processes: one component repairable model – time dependent probability evaluation using Laplace transform approach – evaluation of limiting state probabilities using STPM – two component repairable models.

FREQUENCY AND DURATION TECHNIQUES

Frequency and duration concept – Evaluation of frequency of encountering state, MTTF and MTTR of one , two component repairable models – evaluation of cumulative probability and cumulative frequency of encountering of merged states of two component repairable model.

UNIT – IV

GENERATION SYSTEM RELIABILITY ANALYSIS

Reliability model of a generation system: recursive relation for unit addition and removal , load modeling - Merging of generation load model – evaluation of transition rates for merged state model – cumulative Probability, cumulative frequency of failure evaluation – LOLP, LOLE.

UNIT – V

COMPOSITE SYSTEM RELIABILITY ANALYSIS

Markov model-Weighted average rate model–Reliability Indices– Decomposition method.

DISTRIBUTION SYSTEM AND RELIABILITY ANALYSIS

Basic Concepts – Evaluation of Basic and performance indices of radial networks.

TEXT BOOKS

1. Reliability Evaluation of Engg. System by R. Billinton, R.N.Allan, BS Publications.
2. Reliability Evaluation of Power systems by R. Billinton, R.N.Allan, BS Publications.

REFERENCE BOOKS

1. Reliability Engineering: Theory and Practice by Alessandro Birolini, Springer Publications.
2. An Introduction to Reliability and Maintainability Engineering by Charles Ebeling, TMH Publications.
3. Reliability Engineering by E. Balaguruswamy, TMH Publications.
4. Reliability Engineering by Elsayed A. Elsayed, Prentice Hall Publications.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
Elective-II	**3**	**0**	**3**

(ITD1105) OBJECT ORIENTED PROGRAMMING THROUGH JAVA

UNIT I

Introduction to Java

Introduction: Creation of Java, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, Classes and Objects: Creatingand usage objects, introducing methods,constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing, recursion, nested classes and inner classes, String Handling

UNIT-II

Inheritance, Packages and Interfaces

Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, the Object class. Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.

UNIT-III

Exception Handling and Multithreading

Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle,creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads,deadlocks, thread groups.

UNIT-IV

Event Handling, AWT Controls

Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT : Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics, AWT Controls. Applets - Concepts of Applets, differences between applets and applications,life cycle of an applet, types of applets, creating applets, passing parameters to applets.

UNIT-V

Networking, Java Library, JDBC

Networking: Inetaddress, TCP/IP sockets, Datagrams, URL, URL connection, String handling, java.util, java.io and java.net packages.

JDBC: Different type of Drivers, Connection establishment, Retrieving and manipulation data from client and storing in data base. Java Library: explore io, util, net, lang, sql, awt packages. Introduction to Java APIs: what is API, discuss APIs in Java SS, Java EE, Java ME

TEXT BOOKS

1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi.
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

REFERENCES

1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
4. Beginning in Java 2, Iver Horton, Wrox Publications.
5. Java, Somasundaram, Jaico.
6. Java Networking and AWT API Super Bible, Natraj Nagaratnam, Brian Masco, Arvind Srinivasan, White Group Press

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
Elective-II	**3**	**0**	**3**

(CSE1130) RELATIONAL DATA BASE MANAGEMENT SYSTEMS

UNIT-I

Introduction to Databases and Database Management System - Database system Applications - Advantages of DBMS over File System - Data Models – Instances and schema - View of Data - Database Languages -DDL-DML - Database Users and Administrator - Database System Structure.

UNIT-II

Database Design and ER diagrams – Attributes and Entity Sets – Relationships and Relationship Sets – Constraints - Keys - Design Issues - Entity-Relationship Diagram- Weak Entity Sets - Extended E-R Features - Database Design with ER model - Database Design for Banking Enterprise

UNIT – III

Introduction to the Relational Model – Structure of RDBMS - Integrity Constraints over Relations – Enforcing Integrity Constraints – Querying Relational Data - Relational Algebra and Calculus.

Introduction to SQL- Data Definition commands, Data Manipulation Commands, Basic Structure, Set operations Aggregate Operations - Join operations - Sub queries and correlated queries, SQL functions , views ,Triggers.

UNIT – IV

Functional Dependencies– Introduction , Basic Definitions, Trivial and Non trivial dependencies, closure of a set of dependencies, closure of attributes, irreducible set of dependencies- Schema Refinement in Database Design- Problems Caused by Redundancy – Decompositions – Problem Related to Decomposition –- Lossless Join Decomposition – Dependency Preserving Decomposition - FIRST, SECOND, THIRD Normal Forms – BCNF –– Multivalued Dependencies – Fourth Normal Form.

UNIT-V

Transaction concept- Transaction state- Implementation of atomicity and Durability- Concurrent executions – Serializability, Recoverability

File Organization – Organization of records in file - Data Dictionary Storage – Indexing and Hashing – Basic Concepts , Ordered Indices, B^+Tree Index files.

TEXTBOOKS

1. Database System Concepts, Silberschatz, Korth , Fifth Edition, McGraw hill (1,2,3 and 5 Units)
2. Introduction to Database Systems, C.J.Date, Pearson Education (4^{th} Unit)

REFERENCES

1. Fundamentals of Database Systems, Elmasri Navrate Pearson Education
2. Database Management Systems, Raghu ramakrishnan, Johannes Gehrke, TATA Mc Graw Hill(1,2,3 and 5 Units)
3. Data base Systems design, Implementation, and Management, Peter Rob and Carlos Coronel 7th Edition.
4. Data Base Systems using Oracle : A simplified guide to SQL and PL /SQL, Shah, PHI

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
Elective-II	**3**	**0**	**3**

(MED1164) ELEMENTS OF NANO TECHNOLOGY

UNIT-I

GENERAL INTRODUCTION

Basics of Quantum Mechanics, Harmonic oscillator, magnetic Phenomena, band Structure in solids, Mossbauer and Spectroscopy, optical phenomena bonding in solids, Anisotropy.

UNIT-II

SILICON CARBIDE

Application of Silicon carbide, nano materials preparation, Sintering of SiC, X-ray Diffraction data, electron microscopy sintering of nano particles,

NANO PARTICLES OF ALUMINA AND ZIRCONIA

Nano materials preparation, Characterization, Wear materials and nano composites,

UNIT-III

MECHANICAL PROPERTIES

Strength of nano crystalline SiC, Preparation for strength measurements, Mechanical properties, Magnetic properties,

ELECTRICAL PROPERTIES

Switching glasses with nano particles, Electronic conduction with nano particles

OPTICAL PROPERTIES

Optical properties, special properties and the colored glasses

Process of synthesis of nano powders, Electro deposition, Important nano materials

INVESTIGATING AND MANIPULATING MATERIALS IN THE NANO SCALE

Electron microscopics, scanning probe microscopics, optical microscopics for nano science and technology, X-ray diffraction.

UNIT-IV

NANOBIOLOGY

Interaction between bimolecules and naoparticle surface, Different types of inorganic materials used for the synthesis of hybrid nano-bio assemblies, Application of nano in biology, naoprobes for Analytical Applications-A new Methodology in medical diagnostics and Biotechnology, Current status of nano Biotechnology, Future perspectives of Nanobiology, Nanosensors.

UNIT-V

NANOMEDICINES

Developing of Nanomedicines Nanosytems in use,Protocols for nanodrug Administration, Nanotechnology in Diagnostics applications, materials used in Diagnostics and Therapeutic applications, Molecular Nanomechanics, Molecular devices, Nanotribology, studying tribology at nanoscale, Nanotribology applications.

TEXT BOOKS

1. Nano Materials by A.K.Bandyopadhyay, New Age Publishers.
2. Nano Essentials by T.Pradeep, TMH

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
Elective-II	**3**	**0**	**3**

(MED1163) OPTIMIZATION TECHNIQUES

UNIT – I

INTRODUCTION AND CLASSICAL OPTIMIZATION TECHNIQUES

Statement of an Optimization problem – design vector – design constraints – constraint surface – objective function – objective function surfaces – classification of Optimization problems.

CLASSICAL OPTIMIZATION TECHNIQUES

Single variable Optimization – multi variable Optimization without constraints – necessary and sufficient conditions for minimum/maximum – multivariable Optimization with equality constraints.

Solution by method of Lagrange multipliers – multivariable Optimization with inequality constraints – Kuhn – Tucker conditions.

UNIT – II

LINEAR PROGRAMMING

Standard form of a linear programming problem – geometry of linear programming problems – definitions and theorems – solution of a system of linear simultaneous equations – pivotal reduction of a general system of equations – motivation to the simplex method – simplex algorithm.

TRANSPORTATION PROBLEM

Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel's approximation method – testing for optimality of balanced transportation problems.

UNIT – III

UNCONSTRAINED NONLINEAR PROGRAMMING

One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

UNCONSTRAINED OPTIMIZATION TECHNIQUES

Univariate method, Powell's method and steepest descent method.

UNIT – IV

CONSTRAINED NONLINEAR PROGRAMMING

Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.

UNIT – V

DYNAMIC PROGRAMMING

Dynamic programming multistage decision processes – types – concept of sub optimization and the principle of optimality – computational procedure in dynamic programming – examples illustrating the calculus method of solution - examples illustrating the tabular method of solution.

TEXT BOOKS

1. Engineering optimization: Theory and practice by S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. Introductory Operations Research by H.S. Kasene and K.D. Kumar, Springer (India), Pvt .LTd.

REFERENCES

1. Optimization Methods in Operations Research and systems Analysis – by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research – theory and applications by Dr. S.D.Sharma, Macmillan publishers India Ltd, 4th edition.
3. Operations Research: An Introduction" by H.A. Taha, PHI Pvt. Ltd, 6th edition.
4. Linear Programming by G. Hadley, A. W. Pub.Company, 1962.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
Elective-III	**3**	**0**	**3**

(ECE1112) VLSI DESIGN

UNIT I

INTRODUCTION

Introduction to MOS Technology – MOS, PMOS, NMOS, CMOS and BiCMOS technologies, fabrication fundamentals: Oxidation, Lithography, Diffusion, Ion implantation, Metallization and Encapsulation.

BASIC ELECTRICAL PROPERTIES

Basic Electrical Properties of MOS ,CMOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, gm, gds, figure of merit w_o, Pass transistor, NMOS inverter, Various pull ups, Determination of pull-up to pull-down ratio(Z_{pu} / Z_{pd}) , CMOS Inverter analysis and design, BiCMOS inverters, Latch-up in CMOS circuits.

UNIT II

VLSI CIRCUIT DESIGN PROCESSES

VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layouts, Lambda based design rules, Contact cuts , CMOS Lambda based design rules, Layout Diagrams for logic gates, Transistor structures, wires and vias, Scaling of MOS circuits-Scaling models, scaling factors, scaling factors for device parameters, Limitations of Scaling.

UNIT III

GATE LEVEL DESIGN AND LAYOUT

Architectural issues, Switch logic networks: Gate logic, Alternate gate circuit: Pseudo-NMOS , Dynamic CMOS logic. Basic circuit concepts, Sheet Resistance R_S and its concept to MOS, Area Capacitance Units, Calculations, The delay unit T, Inverter Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers.

UNIT IV

SUBSYSTEM DESIGN

Subsystem Design, Shifters, Adders, ALUs, Multipliers: Array multiplier, Serial-Parallel multiplier, Parity generator, Comparators, Zero/One Detectors, Up/Down Counter, Memory elements.

SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN

PLDs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach.

UNIT V

VHDL SYNTHESIS

VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools.

CMOS TESTING

CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Over view of Chip level Test Techniques and System-level Test Techniques, Layout Design for Improved Testability.

TEXTBOOKS

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, Edition, 2005.
2. Moderan VLSI Design –Wayne Wolf, Pearson Education , 3rd Edition, 1997.
3. CMOS VLSI Design – A circuits and systems perspective, Neil H.E Weste , David Harris , Ayan Banerjee, pearson ,2009.

REFERENCES

1. CMOS logic circuit Design – John P. Uyemura , Springer , 2007
2. VLSI DESIGN – K.Lal Kishore , VSV Prabhakar – I.K..International ,2009
3. VLSI Design – A.Albert Raj, Latha PHI, 2008.
4. .Introduction to VLSI Design- Mead and Convey , BS Publcations, 2010.
5. VLSI Design – M. Michal Vai, CRC Press, 2009.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
Elective-III	**3**	**0**	**3**

(EEE1127) RENEWABLE ENERGY SOURCES

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.

UNIT- II

SOLAR ENERGY COLLECTION & APPLICATIONS

Flat Plate Collectors and Concentrating Collectors, Classification of concentrating collectors, Orientation and Thermal analysis, advanced collectors, Solar ponds, Solar Energy Applications - solar heating/cooling techniques, solar distillation and drying, Photovoltaic Energy Conversion.

UNIT- III

WIND ENERGY

Sources and potentials, Horizontal and Vertical axis wind mills - Types, Blade Design, Performance characteristics, Betz criteria, Induction Generators for Wind power Generation, MHD Generation.

UNIT - IV

BIO-MASS & DEC

Principles of Bio-Conversion, Anaerobic/aerobic digestion, Types of Bio-gas Digesters, gas yield, Combustion characteristics of bio-gas, Utilization for cooking, Economic aspects.

Direct Energy Conversion, Need for DEC, Principles of DEC, Carnot Cycle and Limitations.

UNIT - V

HARNESSING GEOTHERMAL ENERGY & OCEAN ENERGY

Resources of Geothermal Energy, Types of wells, Methods of harnessing the energy, potential in India, Ocean Thermal Energy Conversion, Principles, Utilization, Setting of OTEC plants, Thermodynamic cycles, Tidal and Wave energy: Potential and Conversion Techniques, Mini-Hydel Power plants.

TEXT BOOKS

1. Non-Conventional Energy Sources by G.D.Rai, Khanna Publishers.
2. Renewable Energy Resources by Twidell and Wier, CRC Press (Taylor and Francis).
3. Non- Conventional energy resources by B.H.Khan, Tata Mc Graw-Hill, 2006.

REFERENCE BOOKS

1. Renewable Energy Resources by Tiwari and Ghosal, Narosa.
2. Renewable Energy Technologies by Ramesh and Kumar, Narosa.
3. Non-Conventional Energy Systems by K Mittal, Wheeler Publishing House.
4. Renewable Energy Sources and Emerging Technologies by D.P.Kothari, K.C.Singhal, PHI.

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
Elective-III	**3**	**0**	**3**

(EEE1122) POWER PLANT INSTRUMENTATION AND CONTROL

Unit -I

OVERVIEW OF POWER GENERATION

Brief survey of methods of power generation – Hydro, thermal, nuclear, solar and wind power – Importance of instrumentation in power generation – Thermal power plants – Block diagram – Details of boiler processes – UP and i diagram of boiler – Cogeneration.

Unit- II

MEASUREMENTS IN POWER PLANTS

Electrical measurements – Current, voltage, power, frequency, power factor etc. – Non electrical parameters – Flow of feed water, fuel, air and steam with correction factor for temperature – Steam pressure and steam temperature – Drum level measurement – Radiation detector – Smoke density measurement – Dust monitor.

Unit- III

ANALYSERS IN POWER PLANTS

Flue gas oxygen analyser – Analysis of impurities in feed water and steam – Dissolved oxygen analyser – Chromatography – pH meter – Fuel analyser – Pollution monitoring instruments.

Unit- IV

CONTROL LOOPS IN BOILER

Combustion control – Air/fuel ratio control – Furnace draft control – Drum level control – Main steam and reheat steam temperature control – Super heater control – Air temperature – Deaerator control – Distributed control system in power plants – Interlocks in boiler operation.

Unit- V

TURBINE – MONITORING AND CONTROL

Speed, vibration, shell temperature monitoring and control – Steam pressure control – Lubricant oil temperature control – Cooling system.

TEXT BOOKS

1.The Control of Boilers by Sam G. Dukelow, Instrument Society of America, 1991.
2. Power Plant Engineering by P.K. Nag, Tata McGraw Hill, 2001.
3. Power Plant Technology by Wakil M.M, Tata McGraw Hill.

REFERENCES

1.Standard Boiler Operations by S.M. Elonka and A.L. Kohal, Tata McGraw Hill, New Delhi,1994.
2. Mechanical and Industrial Measurements by . R.K.Jain, Khanna Publishers, New Delhi, 1995.
3. Power Plant Engineering by E.Al. Wakil, Tata McGraw Hill, 1984.
4. Standard Boiler Operations - Questions and Answers by Elonka S.M., and Kohal A.L., TMH, New Delhi, 1994.

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
Elective-III	**3**	**0**	**3**

(CED1147) DISASTER MANAGEMENT

UNIT-1

Introduction to disaster

Concepts and definitions (Disaster, Hazard, Vulnerability, Resilience, Risks)

UNIT-II

Disasters: Classifications, Causes, Impacts (including social, economic, political, environment, health, psychosocial, etc.)

Differential impacts-in terms of caste, class, gender, age, location, disability Global trends in disasters. Urban disaster, pandemics, complex emergencies, Climate change

UNIT-III

Approaches to disaster Risk reduction

Disaster cycle-its analysis, phase, Culture of safety, prevention, mitigation and preparedness, community based DRR, Structural measures, roles and responsibilities of community. Panchayati Raj Institutions/Urban Local Bodies (PRIs/ULBs), states, center and other stake-holders.

UNIT-IV

Inter-relationship between Disaster and Development

Factors affecting Vulnerabilities, differential impacts, impact of development projects such as dams, embankments, change in land-use etc. Climate change Adaption. Relevance of indigenous knowledge, appropriate technology and local resources.

UNIT-V

Disaster Risk Management in India

Hazard and vulnerability profile of India

Components of Disaster relief: Water, food, sanitation, shelter, health, waste management

Institutional arrangements (Mitigation, Response and Preparedness, DM Act Policy, Other related polices, plan, programmes and legislation)

Project Work :(Field Work, Case Studies)

The project/field work is meant for students to understand vulnerabilities and to work on reducing disaster risks and to build a culture of safety. Projects must be conceived creatively based on the geographic location and hazard.

Suggested Reading list:

1. Alexander David, Introduction in 'Confronting Catastrophe', oxford University press, 2000
2. Andharia J. Vulnerability in disaster Discourse, JTCDM, Tata Institute of Social Sciences working paper no.8, 2008
3. Blaikie, P, Cannon T, Davis I, Wisner B 1997. At Risk Natural Hazards, Peoples' Vulnerability and Disaster, Rutledge.
4. Coppola P Damon, 2007. Introduction to International Disaster Management.Carter, Nick 1991.
5. Disaster Management: A Disaster Manager's Handbook. Asian Development Bank, Manila Philippines. Cuny,F.1983.
6. Development and Disasters, Oxford University Press
7. Govt.of India; Disaster Management Act 2005, Government of India, New Delhi.

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IV Year B.Tech EEE – I sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EEE1207) POWER SYSTEMS AND SIMULATION LABORATORY

Part - A

1. Differential protection of 1-Φ transformer.
2. IDMT directional and non-directional relays.
3. Static phase sequence detectors.
4. Power circle diagrams of a 3-Φ transmission line model.
5. ABCD constants and Regulation of a 3-Φ transmission line model.
6. Distance protection of transmission lines.
7. Testing of CT and PT's, insulator strings.
8. Finding the sequence impedances of 3-Φ synchronous machine
9. Finding the sequence impedances of 3-Φ Transformer.
10. Transformer fault analysis, LG, LL, 3-Φ faults and also using PSIM
11. LG, LL and 3-Φ fault analysis of 3-Φ synchronous machine and also using PSIM
12. Characteristics of Micro Processor based Over Current/Over Voltage relay.
13. Performance of Digital Relays
14. (a)Load shedding using SCADA for a Distribution System
    (b)Voltage Control and Fault Analysis using SCADA
15. Power factor improvement through SCADA for a given Distribution System.

Part - B

1. (a) Load flow analysis using MIPOWER/POWERWOLRLD.
   (b) Fault analysis of an IEEE 9-bus test system using POWERWORLD or MIPOWER.
2. (a) Transient analysis of 3-Φ fault on a 3-Φ synchronous generator using PSCAD
   (b) Power system transient analysis of opened line, short circuited line using PSCAD/MATLAB.
3. (a) Voltage profile improvement using shunt compensation using POWERWORLD or MIPOWER.
   (b) Frequency response of a two area Load Frequency control using MATLAB.

Any Eight experiments from Part – A and any Two experiments from Part – B are to be conducted.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	0	**3**	**2**

(ECE1252) DIGITAL SIGNAL PROCESSING APPLICATIONS LAB

The following experiments are to be performed using MATLAB

1. Generation of various signals and sequences (Periodic and Aperiodic), such as unit Impulse step, Square, Saw tooth, Triangular, Sinusoidal, Ramp.
2. Operations on signals and sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
3. Verification of Linearity and Time Invariance Properties of a given Continuous / Discrete System.
4. Linear Convolution and Circular Convolution
5. Computation of Unit sample, Unit step and sinusoidal responses of the given LTI system and verifying its Physical realiazability and stability properties.
6. Discrete Fourier Transform / Inverse Discrete Fourier Transform
7. Power Density Spectrum
8. Sampling theorem Verification.
9. Implementation of Filters using IIR
10. Implementation of Filters using FIR

The following Experiments are to be performed using DSP Processor Kit.

1. Generation of sine wave and square wave using DSP trainer kit
2. PWM generation on DSP training kit
3. To Verify Linear Convolution and Circular Convolution
4. Implementation of FIR (Low Pass/High Pass) using Windowing Technique.
   a. Using Rectangular Window
   b. Using Triangular Window
   c. Using Kaiser Window
5. Implementation of IIR Filter (Low Pass and High pass).
6. To compute Power Density Spectrum(PDS) of a Sequence
7. Stepper Motor Control.
8. Three phase IM speed control.
9. Brushless DC Motor Control

Any <u>Eight</u> experiments from Part – A and any <u>Two</u> experiments from Part – B are to be conducted.

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IV Year B.Tech EEE – I Sem	**L**	**T/P/D**	**C**
	0	**6**	**2**

(EEE1301) INDUSTRIAL ORIENTED MINI PROJECT

VNR Vignana Jyothi Institute of Engineering and Technology

IVYear B.Tech EEE –II Sem	**L**	**T/P/D**	**C**
	3	**1**	**3**

(EEE1123) UTILIZATION OF ELECTRICAL ENERGY

UNIT- I

ILLUMINATION

Illumination: Definitions, types of lighting schemes, Incandescent lamps and fluorescent lamps-polar curves, effect of voltage variation on efficiency and life of lamps, Distribution and control of light, lighting calculations, solid angle, Laws of Illumination-calculations, discharge lamps: Sodium Vapor and Mercury Vapor Lamps, merits of LED Lamps - Illumination Design –Indoor lighting, factory lighting, flood lighting and street lighting-problems.

UNIT- II

HEATING AND WELDING

Electrical heating-advantages, methods and applications, resistance heating, design of heating element, efficiency calculations. Induction heating: core type and core less furnaces and high frequency eddy current heating, dielectric heating: principle and applications - Problems, arc furnaces: direct arc and Indirect arc furnaces-Problems.

Electric welding- types, merits and demerits.

UNIT - III

ELECTRIC DRIVES

Introduction to Electric vehicle, Types of electric drives, choice of motor, starting and running characteristics, speed control, Methods of Electric Braking: Plugging, Rheostatic and Regenerative Braking. Temperature rise, particular applications of electric drives, types of industrial loads, continuous, intermittent and variable loads, load equalization,

UNIT - IV

ELECTRIC TRACTION (Part – I)

Traction Systems: types, Electric traction. Modern 25 KV A.C. single phase traction systems: advantages, equipment and layout of 25 KV single phase A.C. traction system.

Simplified speed time curves, Average and scheduled speed - Quadrilateral and Trapezoidal speed time curves-Problems.

UNIT - V

ELECTRIC TRACTION (Part – II)

Mechanics of train movement: Adhesive Weight, coefficient of Adhesion, tractive effort and specific energy consumption, factors affecting specific energy consumption-problems.

TEXT BOOKS

1. Utilisation of Electric Energy by E. Openshaw Taylor, Orient Longman private limited, 1971.
2. Art & Science of Utilization of electrical Energy by Partab, Dhanpat Rai & Sons.
3. Utilisation of Electric Power and Electric Traction by G.C.Garg, Khanna Publishers

REFERENCE BOOKS

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

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IV Year B.Tech EEE – II sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(EEE1124) HVDC TRANSMISSION

UNIT – I

BASIC CONCEPTS

Necessity of HVDC systems, Economics and Terminal equipment of HVDC transmission systems, Types of HVDC Links, Apparatus required for HVDC Systems, Comparison of AC and DC Transmission, Application of DC Transmission System, Planning and Modern trends in D.C. Transmission.

ANALYSIS OF HVDC CONVERTERS

Choice of Converter Configuration, Analysis of Graetz circuit, Characteristics of 6 Pulse and 12 Pulse converters, Cases of two 3 phase converters in Y/Y mode – their performance.

UNIT – II

CONVERTER AND 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.

REACTIVE POWER CONTROL IN HVDC

Introduction, Reactive Power Requirements in steady state, sources of reactive power-Static VAR Compensators, Reactive power control during transients.

UNIT –III

POWER FLOW ANALYSIS IN AC/DC SYSTEMS

Modelling 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 FAULTS AND 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 and 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. HVDC Power Transmission Systems: Technology and system Interactions by K.R.Padiyar, New Age International (P) Limited, and Publishers.
2. HVDC Transmission by S K Kamakshaiah, V Kamaraju, TMH Publishers.
3. EHVAC and HVDC Transmission Engineering and Practice by S.Rao, Khanna publications.

REFERENCES

1. HVDC Transmission by Jos Arrillaga, The institution of electrical engineers, IEE power & energy series 29, 2nd edition.
2. Direct Current Transmission by E.W.Kimbark, John Wiley and Sons.
3. Power Transmission by Direct Current by E.Uhlmann, B.S.Publications.

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IV Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(EEE1126) EHV AC TRANSMISSION

UNIT – I

LINE AND GROUND REACTIVE PARAMETERS

Necessity of EHV AC transmission, ROW for EHV Lines, advantages and problems, power handling capacity and line losses, mechanical considerations, resistance of conductors, properties of bundled conductors, – bundle spacing and bundle radius-Examples. Line inductance and capacitances – sequence inductances and capacitances – modes of propagation – ground return –Design of grounding grids-Examples

UNIT – II

VOLTAGE GRADIENTS OF CONDUCTORS AND ELECTRO STATIC FIELD

Electrostatics – field of sphere gap – field of line changes and properties – charge – potential relations for multi-conductors – surface voltage gradient on conductors – distribution of voltage gradient on sub-conductors of bundle – Examples. Electrostatic field: calculation of electrostatic field of EHV/AC lines – effect on humans, animals and plants – electrostatic induction in unenergised circuit of double-circuit line – electromagnetic interference-Examples.

UNIT – III

CORONA EFFECTS

Power loss and audible noise (AN) – corona loss formulae – charge voltage diagram – generation, characteristics - limits and measurements of AN – relation between 1-phase and 3-phase AN levels – Examples. Radio interference (RI) - corona pulses generation, properties, limits – frequency spectrum – modes of propagation – excitation function – measurement of RI, RIV and excitation functions – Insulation coordination-Examples.

UNIT- IV

TRAVELLING WAVE THEORY

Lightning Phenomenon-Travelling wave expression and solution- source of excitation-terminal conditions- open circuited and short-circuited end- reflection and refraction coefficients-Lumped parameters of distributed lines-generalized constants-No load voltage conditions and charging current.

UNIT –V

VOLTAGE CONTROL

Power circle diagram and its use – voltage control using synchronous condensers – cascade connection of shunt and series compensation – sub synchronous resonance in series capacitor – compensated lines – static VAR compensating system.

TEXT BOOKS

1. Extra High Voltage AC Transmission Engineering by Rokesh Das Begamudra, New Age International (P) Ltd, Third Edition, 2006.
2. High Voltage Engineering by M.S Naidu, Tata MG Hill, 2nd Edition.

REFERENCE BOOKS

1. High Voltage Engineering Fundamentals by E. Kuffel, J.Kuffel, W.S.Zaengl, Butterworth – Heinemann, Second Edition, 2000.
2. High Voltage Engineering: Theory and Practice by Mazen Abdel-salam, Hussein Ains, Abdab EI – Mors hedy, Roshdy Radwan, Publisher: Marcel Dekker, Inc.2000, Second Edition, Revised and Expanded.
3. High Voltage Engineering and Testing by Hugh M.Ryan, Institution of Electrical Engineers, IEE power and Energy Series 32, 2nd edition.

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IV Year B.Tech EEE – II sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(EEE1121) SPECIAL MACHINES AND CONTROL

UNIT-I

STEPPER MOTORS

Constructional features, principle of operation, modes of excitation, single phase stepping motors, torque production in variable Reluctance (VR) stepping motor, Dynamic characteristics, permanent magnet type Stepper Motor and Hybrid stepper Motors. Open loop control, Closed loop control of stepping motor, microprocessor based controller.

UNIT-II

SYNCHRONOUS RELUCTANCE MOTORS

Constructional features: axial and radial air gap Motors. Operating principle, reluctance torque –Phasor diagram, motor characteristics

linear induction motors.

UNIT-III

SWITCHED RELUCTANCE MOTORS

Constructional features, principle of operation. Torque equation, Power controllers, Characteristics and control. Microprocessor based controller. Sensor less control.

.**UNIT-IV**

PERMANENT MAGNET BRUSHLESS DC MOTORS

Commutation in DC motors, Difference between mechanical and electronic commutators, Hall sensors, Optical sensors, Multiphase Brushless motor, Square wave permanent magnet brushless motor drives, Torque and emf equation, Torque-speed characteristics, Controllers-Microprocessor based controller. Sensorless control.

UNIT-V

PERMANENT MAGNET SYNCHRONOUS MOTORS

Principle of operation, EMF, power input and torque expressions, Phasor diagram, Power controllers, Torque speed characteristics, Self control, Vector control, Current control schemes. Sensor less control.

TEXT BOOKS

1. Brushless Permanent Magnet and Reluctance Motor Drives by T.J.E. Miller, Clarendon Press, Oxford, 1989.
2. Stepping Motors – A Guide to Motor Theory and Practice by P.P. Aearnley, Peter Perengrinus, London, 1982.

REFERENCE BOOKS

1. T. Kenjo, Stepping Motors and Their Microprocessor Controls, Clarendon Press London, 1984.
2. Permanent Magnet and Brushless DC Motors byT. Kenjo and S. Nagamori, Clarendon Press, London, 1988.
3. Special Electrical Machines by K.Venkataratnam, University press, 2008.
4. Generalized theory of electrical machines by P.S.Bimbra, Khanna Publications, 4th edition.

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IV Year B.Tech EEE – II sem	**L**	**T/P/D**	**C**
Elective-IV	**3**	**0**	**3**

(EEE1119) ARTIFICIAL NEURAL NETWORKS AND FUZZY LOGIC

UNIT – I

INTRODUCTION TO NEURAL NETWORKS

Introduction, Humans and Computers, Biological Neuron and organization of the brain, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model and Design of logic gates, 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

SINGLE LAYER FEED FORWARD NEURAL NETWORKS

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem and concepts, Limitations of the Perceptron Model, Applications.

MULTILAYER FEED FORWARD NEURAL NETWORKS

Credit Assignment Problem, Generalized Delta Rule, Derivation of Back propagation (BP) Training, Summary of Back propagation Algorithm, 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

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network, Applications.

Unit – IV

CLASSICAL AND FUZZY SETS

Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Operations, properties, fuzzy relations, membership functions.

Fuzzy Logic System Components

Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT- V

APPLICATIONS

Neural network applications: Process identification, control, fault diagnosis and load forecasting.

Fuzzy logic applications: Fuzzy logic control, Design and Analysis

COURSE OUTCOME

After completion of this course the student will be able to develop artificial neural networks from biological networks, Contrast Biological neuron and Artificial Neuron, Neuron modeling, Fuzzy logic rule based Design, Real time applications on Neural Networks and Fuzzy logic Control.

TEXT BOOKS

1. Neural Networks, Fuzzy logic, Genetic algorithm - synthesis and applications by Rajasekharan and Rai, PHI Publications.
2. Artificial neural networks by B.Yegnarayana, PHI publications.

REFERENCE BOOKS

1. Neural Networks by James A Freeman and Davis Skapura, Pearson Education, 2002.
2. Neural Networks by Simon Hakins , Pearson Education
3. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
4. Neural Networks and Fuzzy Logic System by Bart Kosko, PHI Publications.
5. Introduction to Artificial Neural Systems by J.M.Zurada, Jaico Publishing House.
6. Introduction to Neural Networks using MATLAB 6.0 by S.N.Sivanandam, S.Sumathi, S.N.Deepa, TMH, 2006.

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IV Year B.Tech EEE – II sem	**L**	**T/P/D**	**C**
Elective-V	**3**	**0**	**3**

(EEE1117) ELECTRICAL DISTRIBUTION SYSTEMS

UNIT- I

GENERAL CONCEPTS

Introduction to distribution systems, Load modelling and characteristics. Coincidence factor, contribution factor and loss factor - Relationship between the load factor and loss factor. Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.

UNIT- II

DISTRIBUTION FEEDERS AND SUBSTATIONS

Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage levels, feeder loading; basic design practice of the secondary distribution system. Substations, Location of Substations: Rating of distribution substation, service area within primary feeders, benefits derived through optimal location of substations.

UNIT - III

DISTRIBUTION 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 - IV

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 sectionalizers, and circuit breakers, Coordination of Protective Devices: General coordination procedure Concepts of Smart grid and demand side management.

UNIT - V

ENHANCEMENT OF POWER QUALITY

Analysis of Power Quality indices**,** 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. Voltage Control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop compensation.

TEXT BOOKS

1. Electric Power Distribution system, Engineering by Turan Gonen, TMH.
2. Electric Power Distribution by A.S. Pabla, Tata Mc Graw-hill Publishing Company, 1997, 6th edition.

REFERENCES

1. Electrical Power Distribution and Automation S.Sivanagaraju,V.Sankar,Dhanpat Rai and Co.
2. Electrical Power Distribution Systems by V.Kamaraju,TMH Publishers, 2nd Edition.

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IV Year B.Tech EEE –II Sem	**L**	**T/P/D**	**C**
ELECTIVE-V	**3**	**0**	**3**

(EEE1129) FLEXIBLE A.C. TRANSMISSION SYSTEMS

Unit - I

FACTS CONCEPTS

Transmission interconnections power flow in an AC system, loading capability limits, Dynamic stability considerations, importance of controllable parameters, basic types of FACTS controllers, benefits from FACTS controllers.

UNIT - II

VOLTAGE SOURCE CONVERTERS

Single phase, three phase full wave bridge converters transformer connections for 12 pulse operation.

Three level voltage source converter, pulse width modulation converter, basic concept of current source Converters, and comparison of current source converters with voltage source converters.

UNIT - III

STATIC SHUNT COMPENSATION

Objectives of shunt compensation, mid point voltage regulation, voltage instability prevention, improvement of transient stability, Power oscillation damping, Methods of controllable var generation, variable impedance type static var generators, switching converter type var generators and hybrid var generators.

UNIT - IV

SVC AND STATCOM

SVC : FC-TCR and TSC-TCR

STATCOM: The regulation and slope.

Comparison between SVC and STATCOM

UNIT - V

STATIC SERIES COMPENSATORS

Objectives of Series compensation, concept of series capacitive compensation, GTO thyristor controlled series capacitor (GSC), thyristor switched series capacitor (TSSC), and thyristor controlled series capacitor (TCSC) control schemes for GSC TSSC and TCSC.

TEXT BOOKS

1. Understanding FACTS Devices by N.G. Hingorani and L. Guygi. IEEE Press Publications 2000.
2. Flexible AC Transmission System by Yong- Hua Song, Allan Johns, IEE Press.

REFERENCES

1. Introduction to FACTS Controllers by Kalyan K.Sen and meyling sen, John wiley & sons, Inc., Hoboken, New Jersey. Mohamed E.EI – Hawary, Series editor.
2. FACTS controllers in power transmission and distribution by K.R Padiyar, Motilal UK Books of India (2007).

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IV Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
Elective-V	**3**	**0**	**3**

(EIE1125) PROGRAMMABLE LOGIC CONTROLLERS

UNIT-I

PLC Basics: PLC system, I/O modules and interfacing, CPU processor, programming Equipment, programming formats, construction of PLC ladder diagrams, Devices connected to I/O modules.

PLC Programming: Input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation.

UNIT-II

Digital logic gates, programming in the Boolean algebra system, conversion examples Ladder Diagrams for process control: Ladder diagrams and sequence listings, ladder diagram construction and flowchart for spray process system.

UNIT-III

PLC Registers: Characteristics of Registers, module addressing, holding registers, Input Registers, Output Registers.PLC Functions: Timer functions and Industrial applications, counters, counter function industrial applications, Arithmetic functions, Number comparison functions, number conversion functions

UNIT-IV

Data Handling functions: SKIP, Master control Relay, Jump, Move, FIFO, FAL, ONS, CLR and Sweep functions and their applications.Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two-axis and three axis Robots with PLC, Matrix functions.

UNIT-V

Analog PLC operation: Analog modules and systems, Analog signal processing, Multi bit Data Processing, Analog output Application Examples, PID principles, position indicator with PID control, PID Modules, PID tuning, PID functions.

TEXT BOOKS

1. Programmable Logic Controllers- Principles and Applications by John W. Webb and Ronald A. Reiss, Fifth Edition, PHI.
2. Programmable Logic Controllers- Programming Method and Applications by JR.Hackworth and F.D Hackworth Jr., Pearson, 2004.

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IV Year B.Tech EEE – II Sem	**L**	**T/P/D**	**C**
Elective - V	**3**	**0**	**3**

(ECE1124) EMBEDDED REAL TIME OPERATING SYSTEMS

UNIT 1

FUNDAMENTALS OF EMBEDDED SYSTEMS

Definition – Classification of Embedded Systems - Processors in the system - Other Hardware units. Software components - Examples for embedded systems, Design issues and trends

UNIT 2

EMBEDDED HARDWARE DEVELOPMENT ENVIRONMENT

Processor Architecture- Structured units of a processor - Processor selection factors. Common memory devices - Memory selection - Memory map - Internal devices & I/O devices, Serial devices - Parallel port devices, Timer and Counting devices - Direct memory access, Communication Interface Standards,.

UNIT 3

EMBEDDED SOFTWARE DEVELOPMENT ENVIRONMENT

Embedded System Development Process, Embedded Operating systems, Types of Embedded Operating systems, Host and Target machines, Linkers/Locators for embedded software, getting embedded software into the target system, Testing on host machine.

UNIT 4

REAL TIME OPERATING SYSTEMS CONCEPTS -I

Typical OS structure - RTOS structure - The context of its use - Schedule management for multiple tasks - Scheduling in real time - RTOS task scheduling models – Round Robin, Round Robin with Interrupts, Priority driven- Preemptive and Non-preemptive scheduling

UNIT 5

REAL TIME OPERATING SYSTEMS CONCEPTS -II

Tasks and Task states, Tasks and Data, Semaphores and shared data, Message queues, Mailboxes and Pipes, Timer functions, events, Memory management, Interrupt routines in an RTOS environment.

Case study of RTOS using MUCOS. Case study for RTOS based programming - Coding for Automatic Chocolate vending machine using MUCOS.

TEXT BOOKS

1. An Embedded Software Primer by David E. Simon, Pearson Ed., 2005.
2. Embedded systems - architecture, programming and design by Raj Kamal, Tata McGraw Hill

REFERENCES

1. Real time Systems by J. W. S. Liu, Pearson
2. The 8051 Microcontroller & Embedded Systems using Assembly and C by Ayala & Gadre, Cengage Publications

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IV Year B.Tech EEE – II SEM	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EEE1302) TECHNICAL SEMINAR

VNR Vignana Jyothi Institute of Engineering & Technology

IV Year B.Tech EEE – II SEM	**L**	**T/P/D**	**C**
	0	**3**	**2**

(EEE1303) COMPREHENSIVE VIVA

VNR Vignana Jyothi Institute of Engineering & Technology

IV Year B.Tech EEE – II SEM	**L**	**T/P/D**	**C**
	0	**18**	**12**

(EEE1304) PROJECT WORK