

ACADEMIC REGULATIONS

COURSE STRUCTURE AND DETAILED SYLLABUS

ELECTRICAL & ELECTRONICS ENGINEERING



For

B. Tech. Four Year Degree Course

(Applicable for the batch admitted in 2012-13)

(MR-12 Regulations)

MALLA REDDY ENGINEERING COLLEGE (Autonomous)

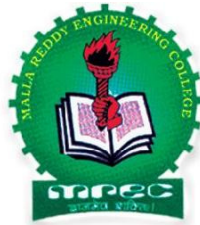
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Maisammaguda, Dhulapally, Post Via (Hakimpet), Secunderabad- 500 014.

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MALLA REDDY ENGINEERING COLLEGE
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Academic Regulations for B. Tech (Regular)
(MR12 Regulations)

(Effective for the students admitted into I year from the Academic Year 2012-2013 onwards)

1. Award of B.Tech. Degree

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

- i. Pursued a course of study for not less than four academic years and not more than eight academic years.
- ii. Register for 200 credits and secure 200 credits

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

3. Courses of study

Malla Reddy Engineering College offers the following courses of study leading to B.Tech. Degree of the Jawaharlal Nehru Technological University Hyderabad (JNTUH), Hyderabad.

1. Civil Engineering
2. Computer Science & Engineering
3. Electrical & Electronics Engineering
4. Electronics & Communications Engineering
5. Information Technology
6. Mechanical Engineering

4. Credits

	I Year		Semester	
	Periods / Week	Credits	Periods / Week	Credits
Theory	03	06	03	03
	02	04	--	--
Practical	03	04	03	02
Drawing	02T/03D	04	03	02
			06	04
Mini Project	--	--	--	02
Comprehens-ive Viva Voce	--	--	--	02
Seminar	--	--	6	02
Project	--	--	15	10

5. Distribution and Weightage of Marks

- i. The performance of a student is evaluated in each semester or I year, subject-wise, with a maximum of 100 marks for theory and 75 marks for practical examinations. The subject-wise syllabus is spread over **1-8 units**. Out of 100 marks in Theory, 25 marks are for internal exam and out of 75 marks in practicals, 25 marks are for internal assessment. In semester system, 2 internal exams are conducted and each exam for 20 marks. Average of the two is considered in final assessment and 5 marks are earmarked for assignment.
- ii. However for first year, there shall be 3 midterm examinations as in the above pattern and the average marks of the best two examinations secured in each subject shall be considered as final marks for **sessionals**.
- iii. For practical subjects there shall be a continuous evaluation during the semester for 25 **internal** marks and 50 end examination marks. Out of the 25 marks for internal, day-to-day work in the laboratory shall be evaluated for 15 marks and internal examination for practical shall be evaluated for 10 marks conducted by the concerned laboratory teacher. The end examination shall be conducted by an external examiner and internal examiner being the laboratory teacher. The external examiner shall be appointed by the **Principal/Controller of** examinations.
- iv. For the subject having design and / or drawing, (such as Engineering Graphics, Engineering Drawing, Machine Drawing) and estimation, the distribution shall be 25 marks for internal evaluation (15 marks for day-to-day work and 10 marks for internal tests) and 75 marks for end examination. There shall be two internal tests in a Semester and the better of the two shall be considered for the award of marks for internal tests. However in the I year class, there shall be three tests and the average of best two will be taken into consideration.
- v. There shall be an industry-oriented mini-Project, in collaboration with an industry of their specialization, to be taken up during the vacation after III year II Semester examination. However, the mini project and its report shall be evaluated along with the project work in IV year II Semester. The industry oriented mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external examiner, head of the department, the supervisor of mini project and a senior faculty member of the department. There shall be no internal marks for industry oriented mini project.
- 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 and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.
- 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 (i) Head of the Department (ii) two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various

subjects he / she studied during the B.Tech course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive viva-voce.

- viii. Out of a total of 200 marks for the project work, **50** marks shall be for Internal Evaluation and **150** marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by the same committee appointed for industry oriented mini project. In addition the project supervisor shall also be included in the committee. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.
- ix. Laboratory marks and the sessional marks awarded by the **concerned teacher** are not final. They are subject to scrutiny and scaling by the **Principal/Controller of examinations** wherever necessary. In such cases, the sessional and laboratory marks awarded by the **concerned teacher** will be referred to a Committee. The Committee will arrive at a scaling factor and the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective **departments/exam branch** as per the University norms and shall be produced to the Committees of the University as and when the same is asked for.

6. Attendance Requirements:

- i. A student shall be eligible to appear for **End** examinations if he acquires a minimum of **75%** of attendance in aggregate of all the subjects.
- ii. **Shortage of Attendance below 65% in aggregate shall in NO case be condoned.**
- iii. Condonation of shortage of attendance in aggregate up to **10%** (**65%** and above and below **75%**) in each semester or I year may be granted by the College Academic Committee.
- iv. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / I year, as applicable. They may seek re-admission for that semester / I year when offered next.
- v. Students whose shortage of attendance is not condoned in any semester / I year are not eligible to take their end examination of that class and their registration shall stand cancelled.
- vi. A stipulated fee shall be payable towards **condonation** of shortage of attendance.

7. Minimum Academic Requirements:

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

- 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%** of marks in the end examination and a minimum of **40%** of marks in the sum total of the internal evaluation and end examination taken together.
- ii. A student shall be promoted from II to III year only if he fulfills the academic requirement of **37** credits from one regular and one supplementary examinations of I year, and one regular examination of II year I

semester irrespective of whether the candidate takes the examination or not. Or as stipulated by affiliating University from time to time.

- iii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of total **62** credits from the following examinations, whether the candidate takes the examinations or not. Or as stipulated by affiliating University from time to time.
 - a. Two regular and two supplementary examinations of I year.
 - b. Two regular and one supplementary examinations of II year I semester.
 - c. One regular and one supplementary examinations of II year II semester.
 - d. One regular examination of III year I semester.
- iv. A student shall register and put up minimum attendance in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of percentage of marks.
- v. 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 shall stand cancelled.

8. Course pattern:

- i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.
- ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.
- iii. When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester / year is offered after fulfilment of academic regulations, whereas the academic regulations hold good with the regulations he was first admitted.

9. Award of Class:

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

Class Awarded	% of marks to be secured	From the aggregate marks secured for the best 200 Credits.
First Class with Distinction	70% and above	
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

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

10. Minimum Instruction Days:

The minimum instruction days for each semester / I year shall be 90/180 clear instruction days.

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

12. There shall be no place transfer within **the Group** Colleges

13. General:

- i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
- ii. The academic regulation should be read as a whole for the purpose of any interpretation.
- iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.
- iv. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the date notified by the University.

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

(Effective for the students getting admitted into II year from the Academic Year 2013-2014 and onwards)

1. The Students have to acquire 150 credits from II to IV year of B.Tech. Program (Regular) for the award of the degree.

Register for **150** credits and secure **150** credits.

2. Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4. Promotion Rule:

A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 37 credits from the examinations.

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

5. Award of Class:

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

First Class with Distinction	70% and above	From the aggregate marks secured for 150 Credits. (i.e. II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

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

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

MALPRACTICES RULES

DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

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

		semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Principal/Controller of examinations 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	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.

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

		appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year.
11.	Copying detected on the basis of internal evidence, such as, during valuation or during special scrutiny.	Cancellation of the performance in that subject and all other subjects the candidate has appeared including practical examinations and project work of that semester/year examinations.
12.	If any malpractice is detected which is not covered in the above clauses 1 to 11 shall be reported to the Principal/Controller of examination for further action to award suitable punishment.	

Malpractices identified by squad or special invigilators

1. Punishments to the candidates as per the above guidelines.
2. Punishment for institutions : (if the squad reports that the college is also involved in encouraging malpractices)
 - (i) A show cause notice shall be issued to the college.
 - (ii) Impose a suitable fine on the college.
 - (iii)** Shifting the examination centre from the college to another college for a specific period of not less than one year.

**DEPARTMENT
OF
ELECTRICAL AND ELECTRONICS ENGINEERING**

Programme Educational Objectives (PEOs)

PEO 1. To train students in core engineering knowledge with software skills, multi disciplinary approach, and make them capable to understand, analyze, design and control electrical machines, power systems and electronic products with solutions for real life applications.

PEO 2. To provide students an impressive academic environment for a successful career in industry/Technical profession and post graduate programmes, research and lifelong learning.

PEO 3. To instill in students professional and ethical attitude, team work skills, leadership qualities and improve oral and written communication skills.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

B.Tech(ELECTRICAL AND ELECTRONICS ENGINEERING)

COURSE STRUCTURE –MR12 Regulations

I year Course Structure

CODE	SUBJECT	L	T/P/D	C
20E01	English	2	1	4
20M01	Mathematics-I	3	1	6
20M02	Mathematical Methods	3	1	6
20P01	Engineering Physics	2	1	4
20C01	Engineering Chemistry	2	1	4
20501	Computer Programming & Data Structures	3	--	6
20303	Engineering Drawing	2	3	4
20502	Computer Programming Lab	--	3	4
20P02	Engineering Physics & Engineering Chemistry Lab	--	3	4
20E02	English Language Communication Skills Lab	--	3	4
20304	Engineering Workshop/IT Workshop	--	3	4
	TOTAL	17	20	50

B.Tech (ELECTRICAL AND ELECTRONICS ENGINEERING)
MR12 Regulations
II year – I Semester **Course Structure**

CODE	SUBJECT	L	T/P/D	C
20M08	Mathematics-III	3	1	3
20339	Fluid Mechanics and Hydraulic Machinery	3	1	3
20401	Electronic Devices and Circuits	4	-	4
20201	Electrical Circuits	4	1	4
20202	Electromagnetic Fields	3	1	3
20203	Electrical Machines-I	4	1	4
20340	Fluid Mechanics and Hydraulic Machinery Lab	-	3	2
20404	Electronic Devices & circuits Lab	-	3	2
	TOTAL	21	11	25

II year – II Semester **Course Structure**

CODE	SUBJECT	L	T/P/D	C
20B01	Managerial Economics and Financial Analysis	4		4
20204	Power Systems-I	3	1	3
20433	Electronic Circuits	3	1	3
20109	Environmental studies	4	1	4
20205	Network Theory	3	1	3
20206	Electrical Machines-II	4	1	4
20207	Electrical Machines Lab – I	-	3	2
20208	Electrical Circuits and Simulation Lab	-	3	2
	TOTAL	21	11	25

**B.Tech (ELECTRICAL AND ELECTRONICS ENGINEERING)
MR12 Regulations**

III year – I Semester

Course Structure

CODE	SUBJECT	L	T/P/D	C
20412	IC Applications	3	1	3
20209	Electrical Measurements	3	1	3
20210	Power Systems-II	4	-	4
20211	Control Systems	3	1	3
20212	Power Electronics	4	1	4
20213	Electrical Machines-III	4	1	4
20214	Electrical Machines Lab – II	-	3	2
20215	Control Systems and Simulation Lab	-	3	2
	TOTAL	21	11	25

III year –II Semester

Course Structure

CODE	SUBJECT	L	T/P/D	C
20B02	Management Science	3	1	3
20216	Power Semiconductor Drives	4	1	4
20217	Computer Methods In Power Systems	4	-	4
20419	Microprocessors and Microcontrollers	4	1	4
202A1	Open Elective Renewable energy sources	3	1	3
20B04	Intellectual property rights			
202A2	Nano Technology			
20540	Operating Systems			
20406	Switching Theory and Logic Design	3	1	3
20218	Electrical Measurements Lab	-	3	2
20219	Power Electronics and Simulation Lab	-	3	2
	TOTAL	21	11	25

B.Tech (ELECTRICAL AND ELECTRONICS ENGINEERING)**MR12 Regulations****IV year – I Semester****Course Structure**

CODE	SUBJECT	L	T/P/D	C
20220	Switch Gear and Protection	3	1	3
20221	Utilization of Electrical Energy	3	1	3
20222	Instrumentation	3	1	3
20223	Power System Operation and Control	4	-	4
	Elective I	4	1	4
202B1	High Voltage Engineering			
20423	VLSI Design			
202B2	Digital Control Systems			
20431	Embedded Systems			
	Elective II	4	1	4
20M12	Optimization Techniques			
202C1	Electrical Distribution Systems			
20432	Principles of Digital Signal Processing			
20541	Database Management Systems			
20421	Microprocessors and Microcontrollers lab	-	3	2
20E07	Advanced English Communication Skills Lab	-	3	2
	TOTAL	21	11	25

IV year – II Semester**Course Structure**

CODE	SUBJECT	L	T/P/D	C
20224	HVDC Transmission	3	-	3
	Elective III	3	1	3
202D1	Neural Networks and Fuzzy Logic			
202D2	Linear Systems Analysis			
202D3	Reliability Engineering Application to Power Systems			
202D4	Electrical Power Quality			
	Elective IV	3	1	3
202E1	Advanced Control Systems			
202E2	EHV AC Transmission			
202E3	Computer System Organization			
202E4	Flexible AC Transmission system			
20225	Industry Oriented Mini Project	-	-	2
20226	Seminar	-	6	2
20227	Project Work	-	15	10
20228	Comprehensive Viva	-	-	2
	TOTAL	9	23	25

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

L-Theory

P-Practical

C-Credits

D-Drawing

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech

L	T/P/D	C
2	1 / - / -	4

ENGLISH

1. INTRODUCTION:

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

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

2. OBJECTIVES:

- a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
- b. To equip the students to study academic subjects with greater facility through the theoretical and practical components of the English syllabus.
- c. To develop the study skills and communication skills in formal and informal situations.

Listening Skills:**Objectives**

- 1) To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- 2) To equip students with necessary training in listening so that can comprehend the speech of people of different backgrounds and regions Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.
 - Listening for general content
 - Listening to fill up information
 - Intensive listening
 - Listening for specific information

Speaking Skills:**Objectives**

- 1) To make students aware of the role of speaking in English and its contribution to their success.
- 2) To enable students to express themselves fluently and appropriately in social and professional contexts.
 - Oral practice
 - Describing objects/situations/people
 - Role play – Individual/Group activities (Using exercises from all the nine units of the prescribed text:

Enjoying Every day English.

- Just A Minute (JAM) Sessions.

Reading Skills:**Objectives**

- 1) To develop an awareness in the students about the significance of silent reading and comprehension.
- 2) To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
 - Skimming the text
 - Understanding the gist of an argument
 - Identifying the topic sentence

- Inferring lexical and contextual meaning
- Understanding discourse features
- Recognizing coherence/sequencing of sentences

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

Writing Skills:

Objectives

- 1) To develop an awareness in the students about writing as an exact and formal skill
- 2) To equip them with the components of different forms of writing, beginning with the lower order ones.
 - Writing sentences
 - Use of appropriate vocabulary
 - Paragraph writing
 - Coherence and cohesiveness
 - Narration / description
 - Note Making
 - Formal and informal letter writing
 - Editing a passage

4. Text Books Prescribed:

In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into **Eight Units**, are prescribed:

For Detailed study

- 1) First Text book entitled "Enjoying Everyday English", Published by Sangam Books, Hyderabad.

For Non-detailed study

- 1) Second text book "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur

For workbook study

- 1) The Grammar and Composition work book titled "A Practice Book on Grammar and Composition" published by Pearson, Delhi.

Syllabus:

Unit –I

- 1) Chapter entitled **Mother Teresa** from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur
- 2) Chapter entitled **Swami Vivekananda** from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur

Unit –II

- 1) Chapter entitled **I Have a Dream** by Martin Luther King from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur
- 2) Chapter entitled **Sam Pitroda** from "Inspiring Speeches and Lives", Published by Maruthi Publications, Guntur

Unit –III

- 1) Chapter entitled **Heaven's Gate** from "Enjoying Everyday English", Published by Sangam Books, Hyderabad
- 2) Chapter entitled **Sir CV Raman: A Pathbreaker in the Saga of Indian Science** from "Enjoying Everyday English", Published by Sangam Books, Hyderabad

Unit –IV

- 1) Chapter entitled **The Connoisseur** from "Enjoying Everyday English", Published by Sangam Books, Hyderabad
- 2) Chapter entitled **The Cuddalore Experience** from "Enjoying Everyday English", Published by Sangam Books, Hyderabad

Unit –V

- 1) Chapter entitled **Bubbling Well Road** from "Enjoying Everyday English", published by sangam books, Hyderabad.

- 2) Chapter entitled **Odds Against Us** from “Enjoying Everyday English”, Published by Sangam Books, Hyderabad

Unit – VI

Practice Exercises on Remedial Grammar covering

Common errors in English, Subject-Verb agreement, Use of Articles and Prepositions, Tense and aspect, Simple, Compound and Complex sentences, Direct and Indirect speech, Conditional Clauses.

Vocabulary development covering

Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

Unit – VII

Exercises on

- Reading and Writing Skills
- Reading Comprehension
- Situational dialogues
- Letter writing
- Essay writing

Unit-VIII

- Note making and Note Taking
- Memo Writing/Notice/Circular
- Summarizing/Abstract Writing
- Report Writing

References:

- 1) Innovate with English: A Course in English for Engineering Students, edited by T Samson, Foundation Books.
- 2) English Grammar Practice, Raj N Bakshi, Orient Longman.
- 3) Effective English, edited by E Suresh Kumar, A RamaKrishna Rao, P Sreehari, Published by Pearson.
- 4) Handbook of English Grammar & Usage, Mark Lester and Larry Beason, Tata Mc Graw –Hill.
- 5) Spoken English, R.K. Bansal & JB Harrison, Orient Longman.
- 6) Technical Communication, Meenakshi Raman, Oxford University Press.
- 7) Objective English Edgar Thorpe & Showick Thorpe, Pearson Education.
- 8) Grammar Games, Renuvolcuri Mario, Cambridge University Press.
- 9) Murphy’s English Grammar with CD, Murphy, Cambridge University Press.
- 10) Everyday Dialogues in English, Robert J. Dixon, Prentice Hall India Pvt Ltd.,
- 11) ABC of Common Errors Nigel D Turton, Mac Millan Publishers.
- 12) Basic Vocabulary Edgar Thorpe & Showick Thorpe, Pearson Education.
- 13) Effective Technical Communication, M Ashraf Rizvi, Tata Mc Graw –Hill.
- 14) An Interactive Grammar of Modern English, Shivendra K. Verma and Hemlatha Nagarajan , Frank Bros & CO
- 15) A Communicative Grammar of English, Geoffrey Leech, Jan Svartvik, Pearson Education
- 16) Enrich your English, Thakur K B P Sinha, Vijay Nicole Imprints Pvt Ltd.,
- 17) A Grammar Book for You And I, C. Edward Good, MacMillan Publishers.

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MALLA REDDY ENGINEERING COLLEGE
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I Year B.Tech

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MATHEMATICS – I

UNIT – I

Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to orthogonal trajectories, Newton’s Law of cooling, Law of natural growth and decay

UNIT – II

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax} , $\sin ax$, $\cos ax$, polynomials in x , $e^{ax} V(x)$, $xV(x)$, method of variation of parameters. Applications to Bending of beams, Simple Harmonic Motion, Electrical Circuits.

UNIT – III

Rolle’s Theorem – Lagrange’s Mean Value Theorem – Cauchy’s mean value Theorem – Generalized Mean Value theorem (all theorems without proof) Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints

UNIT – IV

Radius, Centre and Circle of Curvature – Evolutes and Envelopes Curve tracing – Cartesian, polar and parametric curves.

UNIT – V

Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates multiple integrals - double and triple integrals – change of variables – change of order of integration.

UNIT – VI

Vector Calculus: Gradient- Divergence- Curl and their related properties of sums- products- Laplacian and second order operators. Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Green’s theorem-Stoke’s and Gauss’s Divergence Theorem (With out proof). Verification of Green’s - Stoke’s and Gauss’s Theorems.

UNIT – VII

Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac’s delta function ,– Convolution theorem – Periodic function - Differentiation and integration of transforms, Transfer functions and elementary properties -Application of Laplace transforms to ordinary differential equations Partial fractions-Heaviside’s Partial fraction expansion theorem.

UNIT – VIII

Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy’s root test – Raabe’s test – Absolute and conditional convergence

TEXT BOOKS:

1. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand publications.
2. Engineering Mathematics – I by B.V.Ramana, Tata Mcgrawhill publications.

REFERENCES:

1. Engineering Mathematics – I by E.Rukmangadachari, Pearson Education Ltd.
2. Engineering Mathematics – I by P.B. Bhaskara Rao, S.K.V.S. Rama Chary, M. Bhujanga Rao.
3. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
4. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
5. Higher Engineering Mathematics – B.S. Grewal, Khanna Publications.
6. Engineering Mathematics – I by Shanaz Bathul
7. Engineering Mathematics – I by C.Shankaraiah, VGS Booklinks
8. Engineering Mathematics – I by Sarveswara Rao Koneru, Universities Press, Hyderabad
9. A text Book of KREYSZIG'S Engineering Mathematics, Vol-1 Dr .A. Ramakrishna Prasad. WILEY Publications.

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MATHEMATICAL METHODS

UNIT – I : Solution for linear systems

Matrices and Linear systems of equations: Elementary row transformations-Cryptography-Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- LU Decomposition- LU Decomposition from Gauss Elimination –Solution of Tridiagonal Systems-Solution of Linear Systems

UNIT – II : Eigen Values & Eigen Vectors

Eigen values, eigen vectors – properties – Condition number of rank, Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix – Modal and spectral matrices. Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation – OrthogonalTransformation.

Complex matrices: Hermitian, Skew-Hermtian and Unitary – Eigen values and eigen vectors of complex matrices and their properties. Dominant eigen values and eigen vectors.

UNIT – III : Linear Transformations

Quadratic forms- Reduction of quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index - signature - Sylvester law, Singular value decomposition.

UNIT – IV : Solution of Non- linear Systems

Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences- Backward differences –Central differences – Symbolic relations and separation of symbols- Difference Equations - Differences of a polynomial-Newton’s formulae for interpolation – Central difference interpolation Formulae – Gauss Central Difference Formulae –Interpolation with unevenly spaced points-Lagrange’s Interpolation formula. B. Spline interpolation - Cubic spline.

UNIT – V : Curve fitting & Numerical Integration

Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by method of least squares. Numerical Differentiation – Simpson’s 3/8 Rule , Gaussian Integration, Evaluation of principal value integrals, Generalized Quadrature.

UNIT – VI : Numerical solution of IVP’s in ODE

Numerical solution of Ordinary Differential equations: Solution by Taylor’s series-Picard’s Method of successive Approximations-Euler’s Method-Runge-Kutta Methods –Predictor-Corrector Methods- Adams- Bashforth Method.

UNIT – VII Fourier Series

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 sine and cosine expansions.

UNIT – VIII Partial differential equations

Introduction and Formation of partial differential equation by elimination of arbitrary constants and arbitrary functions, solutions of first order linear (Lagrange) equation and nonlinear (Standard type) equations, Method of separation of variables for second order equations -Two dimensional wave equation.

TEXT BOOKS:

1. Mathematical Methods by T.K.V. Iyengar, B.Krishna Gandhi & Others, S. Chand, publications.
2. Mathematical Methods by B.V. Ramana, Tata Mcgrawhill publications

REFERENCES:

1. Mathematical Methods by E. Rukmangadachari, Pearson Education Ltd.
2. Mathematical Methods by P.B. Bhaskara Rao, S.K.V.S. Rama Chary, M. Bhujanga Rao, B.S.Publications.
3. Mathematical Methods by K.V. Suryanarayana Rao by Scitech Publications.
4. Introductory Methods by Numerical Analysis by S.S. Sastry, PHI Learning Pvt. Ltd.
5. Mathematical Methods by G.Shankar Rao, I.K. International Publications, N.Delhi
6. Numerical Methods by B.S. Grewal, Khanna Publications.
7. Mathematical Methods by V. Ravindranath, Etl, Himalaya Publications. 2009-2010
8. A text Book of KREYSZIG'S Mathematical Methods, Dr .A. Ramakrishna Prasad. WILEY publications

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MALLA REDDY ENGINEERING COLLEGE
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ENGINEERING PHYSICS

UNIT-I

1. Oscillations and Acoustics:

Introduction, Differential equation for S.H.M. and its solution, velocity and acceleration, expression for period and frequency, graphs of displacement, velocity and acceleration, energy of the oscillator, Phasor, Damped vibrations – under damping, over damping and critical damping, energy and amplitude of a damped oscillator, Forced vibrations – Resonance, amplitude and phase, energy considerations, power dissipation, sharpness of resonance, electrical vibrations, free oscillations in a circuit containing inductance, capacitance and resistance.

Basic Requirements of Acoustically Good Hall, Reverberation and Time of Reverberation, Sabine's Formula for Reverberation Time (Qualitative Treatment), Factors Affecting The Architectural Acoustics and their Remedies. Acoustic Quieting: Aspects of Acoustic Quieting, Methods of Quieting,

Unit – II

2. Bonding in Solids:

Ionic Bond, Covalent Bond, Metallic Bond, Hydrogen Bond, Vander-Waal's Bond, Calculation of Cohesive Energy.

3. Crystallography and Crystal Structures:

Space Lattice, Unit Cell, Lattice Parameters, Crystal Systems, Bravais Lattices, Miller Indices, Crystal Planes and Directions, Inter Planar Spacing of cubic Crystal System, Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC, Diamond and hcp Structures, Basic Principles of X – ray diffraction, Bragg's Law

4. Defects in Crystals:

Point Defects: Vacancies, Substitutional, Interstitial, Frenkel and Schottky Defects; Qualitative treatment of line (Edge and Screw Dislocations) Defects, Burger's Vector, Surface Defects and Volume Defects.

UNIT-III

5. Principles of Quantum Mechanics:

Waves and Particles, de Broglie Hypothesis, Matter Waves, Davisson and Germer's Experiment, G. P. Thomson Experiment, Heisenberg's Uncertainty Principle, Schrödinger's Time Independent Wave Equation - Physical Significance of the Wave Function - Particle in One Dimensional infinite Potential Box.

6. Band Theory of Solids:

Electron in a periodic Potential, Bloch Theorem, Kronig-Penny Model (Qualitative Treatment), Origin of Energy Bands in Solids, Classification of Materials into Conductors, Semi Conductors & Insulators, Concept of Effective Mass of an Electron and Hole.

UNIT-IV

7. Semiconductor Physics:

Fermi Level in Intrinsic and Extrinsic Semiconductors, Intrinsic Semiconductors and Carrier Concentration, Extrinsic Semiconductors and Carrier Concentration, Equation of Continuity, Direct & Indirect Band Gap Semiconductors, Hall Effect.

8. Sensors: (Qualitative Treatment)

Basic working Principle of Sensors, Self generating sensor, Modulating Sensor, **Thermal sensors** - Thermistor, Thermocouple; **Mechanical sensors** – Strain gauge; **Magnetic sensors** – Hall Plate, Magnetic resistor; **Chemical sensors** – Metal oxide sensor; **Optical sensors** – Photo detectors

UNIT-V

9. Dielectric Properties:

Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector, Electronic, Ionic and Orientation Polarizations and Calculation of Polarizabilities - Internal Fields in Solids (qualitative treatment), Clausius - Mossotti Equation, Frequency dependence of dielectric constant, Piezo-electricity, Pyro-electricity and Ferro- electricity.

UNIT-VI

10. Magnetic Properties:

Permeability, Field Intensity, Magnetic Field Induction, Magnetization, Magnetic Susceptibility, Origin of Magnetic Moment, Bohr Magneton, Classification of Dia, Para and Ferro Magnetic Materials on the basis of Magnetic Moment, Domain Theory of Ferro Magnetism on the basis of Hysteresis Curve, Soft and Hard Magnetic Materials, Properties of Anti-Ferro and Ferri Magnetic Materials, Ferrites and their Applications, Concept of Perfect Diamagnetism, Meissner Effect, Magnetic Levitation, Applications of Superconductors.

UNIT-VII

11. Lasers:

Characteristics of Lasers, Spontaneous and Stimulated Emission of Radiation, Meta-stable State, Population Inversion, Lasing Action, Einstein's Coefficients and Relation between them, Helium-Neon Laser, Carbon Dioxide Laser, Semiconductor Diode Laser, Applications of Lasers – Data storage, Medical, Military, Scientific and industrial.

12. Fiber Optics:

Principle of Optical Fiber, Acceptance Angle and Acceptance Cone, Numerical Aperture, Types of Optical Fibers and Refractive Index Profiles, Attenuation in Optical Fibers, Application of Optical Fibers – Medical, Level sensor, Communication system.

UNIT-VIII

13. Nanotechnology:

Origin of Nanotechnology, NanoScale, Surface to Volume Ratio, Quantum Confinement, Bottom-up Fabrication: Sol-gel, Precipitation, Combustion Methods; Top-down Fabrication: Chemical Vapour Deposition, Physical Vapour Deposition, Pulsed Laser Vapour Deposition Methods, Characterization(XRD&TEM) and Applications.

TEXT BOOKS:

1. Modern Engineering Physics by K. Vijaya Kumar, S. Chandralingam: S. Chand & Co.Ltd
2. Engineering Physics – P.K.Palanisamy - SciTech Publications Pvt. Ltd., 5th Print 2008.
3. Applied Physics – S.O. Pillai & Sivakami-New Age International (P) Ltd., 2nd Edition 2008.
4. Physics of Semiconductor devices - S.M sze and Kwok K . Ng (Wiley Student Edition) – Third edition.
5. Mechanics of particles, Waves & Oscillations by Anwar Kamal, New Age International Ltd.

REFERENCES:

1. Solid State Physics – M. Armugam (Anuradha Publications).
2. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co. (for acoustics).
3. Nanotechnology – M.Ratner & D. Ratner (Pearson Ed.).
4. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
5. Solid State Physics – A.J. Dekker (Macmillan).
6. Applied Physics – T. Bhima Shankaram & G. Prasad (B.S. Publications, Third Edition 2008).
7. A text book of Engineering Physics – S.P. Basvaraju – Subhas store
8. Electricity and magnetism by Edward Purcell – Berkeley series vol 2

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MALLA REDDY ENGINEERING COLLEGE
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2 1/-/- 4

ENGINEERING CHEMISTRY

UNIT I:

Water: Introduction, Hardness: Causes, expression of hardness - units - types of hardness, estimation of temporary & permanent hardness of water, 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, electro dialysis.

UNIT II:

Corrosion and its corrosion control: Introduction, causes and different types of corrosion and effects of corrosion, theories of corrosion - Chemical, Electrochemical corrosion, corrosion reactions, factors affecting corrosion - Nature of metal - galvanic series, purity of metal, nature of oxide film, nature of corrosion product. Nature of environment-effect of temperature, effect of pH, Humidity, effect of oxidant. Corrosion control methods - Cathodic protection, sacrificial anode, impressed current cathode. Surface coatings - methods of application on metals-hot dipping, galvanizing, tinning, cladding, electroplating Organic surface coatings - paints constituents and functions.

UNIT III:

Polymers: Types of Polymerization, Mechanism Chain growth & Step growth).Plastics: Thermoplastic resins & Thermo set resins. Compounding & fabrication of plastics, preparation, properties, engineering applications of: polyethylene, PVC, PS, Teflon, Bakelite, Nylon. Rubber - Natural rubber, vulcanization. Elastomers - Buna-s, Butyl rubber, Thiokol rubbers, Fibers - polyester,.

Structure and property relation .Explanation of mechanical, electrical, optical and chemical properties.

Fiber reinforced plastics (FRP), applications

UNIT IV:

Semi Conductor Chemistry: Intrinsic and extrinsic semiconductors, n-type and p-type semiconductors, preparation of ultra pure silicon and germanium.

Introduction and fundamental aspects of Optical fibers, fullerenes and organic electronic materials.

Introduction and fundamental aspects of Conducting Polymers: Poly acetylene, conduction, doping, and applications.

Liquid Crystal polymers : Characteristics and uses.

UNIT V:

Surface Chemistry: Solid surfaces, types of adsorption, Langmuir adsorption isotherm, & application adsorption, classification of colloids, Electrical, mechanical & optical properties micelles, applications of colloids in industry.

Nano materials: Introduction, basic methods of preparation and applications of nano materials.

UNIT VI:

Energy sources: fuels, classification - conventional fuels (solid, liquid, gaseous) Solid fuels - coal - analysis - proximate and ultimate analysis and their significance Liquid fuels - primary - petroleum -refining of petroleum-cracking knocking synthetic petrol - Bergius and Fischer Tropsech's process; Gaseous fuels - natural gas, analysis of flue gas by Orsat's method Combustion - problems, Calorific value of fuel - HCV, LCV, determination of calorific value by Junker's gas calorie meter.

UNIT VII:

Phase rule: Definitions - phase, component, degree of freedom, phase rule equation. Phase diagrams - one component system: water system. Two component system lead-silver system. Alloys: introduction, classification and properties.

UNIT VIII:

Materials Chemistry: Cement: composition of Portland cement, manufacture of Portland cement, setting & hardening of cement (reactions). Lubricants: Criteria of a good lubricant, mechanism, properties of lubricants: Cloud point, pour point, flash & fire point, Viscosity. Refractories: Classification, Characteristics of a good refractory. Insulators & conductors: Classification of insulators characteristics of thermal & electrical insulators and applications. Superconductors – applications of Nb-Sn alloy, and $\text{YBa}_2\text{Cu}_3\text{O}_{7-x}$.

Text Books:

- 1 Text Book of Engineering Chemistry by Shashi Chawla, Dhanpat Rai publishing Company, New Delhi (2008).
- 2 Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company.(2008).
- 3 Engineering Chemistry by Daniel Yesudian, Anuradha Publications, Chennai

Reference Books:

- 1.Engineering Chemistry by B. Siva Shankar, Mc.Graw Hill Publishing Company Limited, New Delhi -2006.
- 2.Engineering Chemistry by J.C. Kuriacase & J. Rajaram, Tata McGraw Hills co., New Delhi (2004).
- 3.Chemistry of Engineering Materials by CV garwal, C.P Murthy, A.Naidu, BS Publications.
- 4.Chemistry of Engineering Materials by R.P Mani and K.N.Mishra, CENGAGE learning.
- 5.Applied Chemistry - A text for Engineering & Technology - Springer (2005).
- 6.Engineering Chemistry by R. Gopalan, D. Venkatappayya, D.V. Sulochana Nagarajan Vikas Publishers (2008).
7. Text of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co, New Delhi (2006)
- 8.Text Books of Engineering Chemistry by C.P. Murthy, C.V. Agarwal, A. Naidu B.S. Publications, Hyderabad.

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MALLA REDDY ENGINEERING COLLEGE
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I Year B.Tech

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COMPUTER PROGRAMMING AND DATA STRUCTURES

UNIT-I

Introduction to Computers: Introduction to Computers – Computer Systems, Computing Environments, Computer Languages, Creating and running programmes, Algorithms, Pseudo code, flow charts, Software Development Method, applying the software development method.

UNIT-II

Introduction to C Language – Background, Simple C Programme, Identifiers, Basic data types, Variables, Constants. Input/output, Operators, Expressions, Precedence and Associativity, Expression Evaluation, Type conversions, Bit wise operators, Statements, Simple C Programming examples.

Selection Statements – if and switch statements, Repetition statements – while, for, do-while statements, Loop examples, other statements related to looping – break, continue, goto, Simple C Programming examples.

UNIT-III

Designing Structured Programmes, Functions, basics, user defined functions, inter function communication.

Standard functions, Scope, Storage classes-auto, register, static, extern, scope rules, type qualifiers, recursion-recursive functions, Preprocessor commands, example C programmes.

Arrays – Concepts, using arrays in C, inter function communication, array applications, two – dimensional arrays, multidimensional arrays, C programme examples.

UNIT-IV

Derived types – Structures – Declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, self referential structures, unions, typedef, bit fields, enumerated types, C programming examples

UNIT-V

Strings – Concepts, C Strings, String Input / Output functions, arrays of strings, string manipulation functions, string / data conversion, example C programmes.

Pointers – Introduction (Basic Concepts), Pointers for inter function communication, pointers to pointers, compatibility, memory allocation functions, array of pointers, programming applications, pointers to void, pointers to functions, pointers to structures, command –line arguments, C programme examples.

UNIT-VI

Input and Output – Concept of a file, streams, standard input / output functions, formatted input / output functions, text files and binary files, file input / output operations, file status functions (error handling), C programme examples,

UNIT-VII

Searching and Sorting – Sorting- selection sort, bubble sort, insertion sort, quick sort, merge sort, Searching-linear and binary search methods.

UNIT-VIII

Data structures – introduction to data structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, stacks-operations, array and linked representations of stacks , stack application-infix to postfix conversion evaluation, queues-operations, array and linked representation, Introduction to Graphs & Trees and their representations.

Text Books:

1. C Programming & Data Structures, B.A Forouzan and R.F.Gilberg, Third Edition, Cengage Learning.
2. Problem Solving and Program Design in C, J.R Hanly and E.B Koffman, Fifth Edition, Pearson education.

References:

1. C & Data Structures- P. Padmanabham, Third Edition B.S. Publications
2. C Programming And Data Structures, E.Balaguru Swamy, TMH
3. C and Data Structures, Ashok N.Kamthane, Pearson Edition.
4. C Programming by D.Ravi Chandran.
5. The C Programming Language B.W. Kernighan and Dennis M.Ritchie, PHI/pearson Education
6. C programming with problem solving, J.A.Jones & K.Harrow, dreamtech press
7. “Let Us C” by Yashwanth Kenetkar.
8. C how to program Paul Deitel and Harvey Deitel. PH.

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ENGINEERING DRAWING

UNIT – I

INTRODUCTION TO ENGINEERING GRAPHICS: Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions. Curves used in Engineering Practice & their Constructions :

- a) Conic Sections-Parabola, Ellipse and Hyperbola. (Hyperbola – General method only).
- b) Cycloid, Epicycloid and Hypocycloid
- c) Involute.
- d) Scales: Different types of Scales, Plain scales, Vernier scales , Diagonal scales.

UNIT – II

DRAWING OF PROJECTIONS OR VIEWS ORTHOGRAPHIC PROJECTION IN FIRST ANGLE

PROJECTION: Principles of Orthographic Projections – Conventions – First and Third Angle, Projections of Points and Lines inclined to both planes,

UNIT – III

PROJECTIONS OF PLANES & SOLIDS: Projections of regular Planes, projection inclined to both planes. Projections of Regular Solids inclined to both planes

UNIT – IV

SECTIONS AND SECTIONAL VIEWS:- Section Plane inclined to one reference plane. Right Regular Solids – Prism, Cylinder, Pyramid, Cone

DEVELOPMENT OF SURFACES: Development of Surfaces of Right, Regular Solids – Prisms, Cylinder, Pyramid Cone.

UNIT – V

INTERSECTION OF SOLIDS:- Intersection of Cylinder Vs Cylinder, Cylinder Vs Prism, Cylinder Vs Cone.

UNIT – VI

ISOMETRIC PROJECTIONS : Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions – Isometric Views of Lines, Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Simple regular Geometries.

UNIT –VII

TRANSFORMATION OF PROJECTIONS : Conversion of Isometric Views to Orthographic Views.

UNIT – VIII

PERSPECTIVE PROJECTIONS : Perspective View : Points, Lines, Plane Figures and Simple Solids,

TEXT BOOK :

1. Engineering Drawing, N.D. Bhat / Charotar
2. Engineering Drawing and Graphics, Venugopal / New age.
3. Engineering Drawing – Basant Agrawal, TMH

REFERENCES :

1. Engineering drawing – P.J. Shah.S.Chand.
2. Engineering Drawing, Narayana and Kannaiah / Scitech publishers.
3. Engineering Drawing- Johle/Tata Macgraw Hill.
4. Computer Aided Engineering Drawing- Trymbaka Murthy- I.K. International.
5. Engineering Drawing – Grower.
6. Engineering Graphics for Degree – K.C. John.

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MALLA REDDY ENGINEERING COLLEGE
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I Year B.Tech

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COMPUTER PROGRAMMING LAB
(Common for ME, CE, EEE, ECE, CSE & IT)

Objectives:

- To make the student learn a programming language.
- To make the student learn algorithms, pseudo code and flowcharts.
- To make the students learn debugging concepts.
- To teach the student to write programs in C to solve the problems
- To introduce the student to simple linear and non linear data structures such as lists, stacks, queues, trees and graphs.

Recommended Systems/Software Requirements:

- Intel based desktop PC
- ANSI C Compiler with Supporting Editors

Week 1:

a) Practice various DOS internal and external commands.

Week 2:

- a) Implement various programme logics using algorithms and flowcharts.
b) Practice various debugging techniques using simple C programs.

Week 3:

- a) Write a C program to find the sum of individual digits of a positive integer.
b) A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 4:

- a) Write a C program to calculate the following Sum:
$$\text{Sum} = 1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$$

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

Week 5:

- a) Write C programs that use both recursive and non-recursive functions
i) To find the factorial of a given integer.
ii) To find the GCD (greatest common divisor) of two given integers.

Week 6:

- a) Write a C program to find reverse of a number.(e.g. reverse of 123 is 321)
b) Write a C program to find whether the given number is Palindrome or not.
(Note: palindrome means reverse of a number should be equal to the given number)
c) Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use Switch Statement)

Week 7:

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

- b) Write a C program that uses functions to perform the following:
- i) Addition of Two Matrices
 - ii) Multiplication of Two Matrices

Week 8:

- a) Write a C program that uses functions to perform the following operations:
- i) To insert a sub-string in to given main string from a given position.
 - ii) To delete n Characters from a given position in a given string.
- b) Write a C program to determine if the given string is a palindrome or not

Week 9:

- a) Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn't contain T.
- b) Write a C program to count the lines, words and characters in a given text.

Week 10:

- a) Write a C program to generate Pascal's triangle.
- b) Write a C program to construct a pyramid of numbers.

Week 11:

Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
 $1+x+x^2+x^3+\dots\dots\dots + x^n$

For example: if n is 3 and x is 5, then the program computes 1+5+25+125.
Print x, n, the sum

Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if $n < 0$, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

Week 12:

- a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.
- b) Write a C program to convert a Roman numeral to its decimal equivalent.

Week 13:

- Write a C program that uses functions to perform the following operations:
- i) Reading a complex number
 - ii) Writing a complex number
 - iii) Addition of two complex numbers
 - iv) Multiplication of two complex numbers
- (Note: represent complex number using a structure.)

Week 14:

- a) Write a C program which copies one file to another.
- b) Write a C program to reverse the first n characters in a file.
(Note: The file name and n are specified on the command line.)

Week 15:

- Write a C program that uses functions to perform the following operations on singly linked list.:
- i) Creation
 - ii) Insertion
 - iii) Deletion
 - iv) Traversal

Week 16:

Write C programs that implement stack (its operations) using
i) Arrays ii) Pointers

Week 17:

Write C programs that implement Queue (its operations) using
i) Arrays ii) Pointers

Week 18:

Write a C program that uses Stack operations to perform the following:
i) Converting infix expression into postfix expression
ii) Evaluating the postfix expression

Week 19:

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

Week 20:

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
i) Bubble sort ii) Selection sort

Week 21:

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
i) Insertion sort ii) Merge sort

Week 22:

Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
i) Quick sort

Week 23:

i) Write a C program to implement Newton Raphson Method.

Week 24:

Write C programs to implement
i) Trapezoidal Method ii) Simpson's method.

Text Books:

1. C programming and Data Structures, P. Padmanabham, Third Edition, BS Publications
2. Mastering C, K.R.Venugopal and S.R.Prasad., TMH Publications.
3. Data Structures: A pseudo code approach with C, second edition R.F. Gilberg and B.A. Forouzan
4. Programming in C, P.Dey & M. Ghosh, Oxford Univ.Press.
5. C and Data Structures, E Balaguruswamy, TMH publications.
6. Computer Basics and C programming, V.Rajaraman, PHI publications.

2012-16

Code: 20P02

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech

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Engineering Physics Lab & Engineering Chemistry Lab
(Common for ME, CE, EEE, ECE, CSE & IT)

Engineering Physics Lab

Any ten experiments out of the following thirteen experiments should be performed.

List of the Experiments

S.No.	Name of the Experiment
1	Sonometer - Frequency of A.C supply
2	Dispersive Power of the Prism
3	Torsional Pendulum
4	Diffraction Grating – Determination of wavelength of D ₁ and D ₂ lines
5	Melde's Experiment
6	RC Time Constant
7	Single slit Diffraction using LASER
8	Numerical Aperture and Bending losses of an optical fiber
9	LCR Series Resonance
10	Stewart & Gee's Method – Magnetic field along the axis of a current carrying circular coil.
11	Pohl's pendulum
12	Refractive index of liquid using Hollow prism
13	Energy band Gap of a given Semiconductor

Text Book:

Engineering Physics Practicals by Dr. B. Srinivasa Rao, V.K.V. Krishna and K.S. Rudramamba – Lakshmi Publications, New Delhi.

Engineering Chemistry Lab

Any twelve experiments out of the following thirteen experiments should be performed.

Titrimetry:

- 1 Estimation of hardness of water by EDTA method. (or)
Estimation of calcium in limestone by Permanganometry.

Mineral Analysis:

- 2 Determination of percentage of copper in brass
- 3 Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:

4. Colorimetry:

- Determination of ferrous iron in cement by colorimetric method.
(Or) Estimation of Copper by Colorimetric method.

5. Conductometry:

- Conductometric titration of strong acid Vs strong base.
(or) Conductometric titration of mixture of acids Vs strong base.

6. Potentiometry:

- Titration of strong acid Vs strong base by potentiometry.
(or) Titration of weak acid Vs strong base by potentiometry.

Physical Properties:

7. Determination of viscosity of sample oil by redwood/oswald's viscometer
8. Determination Surface Tension of lubricants.

Identification and Preparations:

9. Identification of functional groups present in organic compounds.
10. Preparation of organic compounds
Asprin (or) Benzimidazole

Kinetics:

11. To determine the rate constant of hydrolysis of methyl acetate catalysed by an acid and also the energy of activation. (or) To study the kinetics of reaction between $K_2S_2O_8$ and KI .
12. **Demonstration Experiments** (Any One of the following) :
 - a. Determination of dissociation constant of weak acid-by PH metry
 - b. Preparation of Thiokol rubber
 - c. Adsorption on Charcoal
 - d. Heat of reaction.
13. Preparation of Nylon 6:6
14. Preparation of Biodiesel from Waste Vegetable Oil (WVO).
15. Determination of pH of water.
16. Determination of free chlorine or chlorides in water.

TEXT BOOKS:

1. Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2. Inorganic quantitative analysis, Vogel.

REFERENCE BOOKS:

1. Text Book of engineering chemistry by R. N. Goyal and Harmendra Goel.
2. A text book on experiments and calculations . S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

2012-16

Code: 20E02

MALLA REDDY ENGINEERING COLLEGE
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I Year B.Tech

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ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common for ME, CE, EEE, ECE, CSE & IT)

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

Objectives:

1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.

SYLLABUS:

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

Unit-I

Introduction to Situational Dialogues/Role Play-making the students perform Role Play-Assessment.

Unit-II

Introduction to Oral Presentations- Prepared and Extempore -making the students participate in Oral Presentations-Assessment.

Unit-III

Introduction to Just A Minute Sessions -making the students participate in JAM sessions-Assessment.

Unit-IV

Introduction to Describing Objects / Situations / People and Giving Directions -making the students participate in the activity regarding Describing Objects, Situations, People and giving directions –Assessment.

Unit-V

Introduction to Information Transfer -making the students transfer the information from one form to the other-Assessment.

Unit-VI

Introduction to Debate-making the students participate in Debate sessions-Assessment.

Unit-VII

Introduction to Telephoning Skills.-making the students participate in the activities regarding Telephoning Skills-Assessment.

Unit-VIII

Introduction to the Sounds of English- Vowels, Diphthongs & Consonants and Stress and Intonation.

Minimum Requirement:

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:

- i. P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii. Headphones of High quality

Suggested Software:

- Cambridge Advanced Learners' English Dictionary with CD.
- The Rosetta Stone English Library.
- Clarity Pronunciation Power – Part I.
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley Series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition.
- Learning to Speak English - 4 CDs.
- Vocabulary in Use, Michael McCarthy, Felicity O'Den, Cambridge.
- Murphy's English Grammar, Cambridge with CD.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

Prescribed Text book.

A Manual for English Language Laboratories by D. Sudha Rani, Pearson publications, New Delhi, 2011

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):

Foundation Books.

1. A Handbook for English Language Laboratories – Prof. E. Suresh Kumar, P. Sreehari,
2. Effective Communication & Public Speaking by S. K. Mandal, Jaico Publishing House.
3. English Conversation Practice by Grant Taylor, Tata McGraw Hill.
4. Speaking English effectively by Krishna Mohan, N. P. Singh, Mac Millan Publishers.
5. Communicate or Collapse: A Handbook of Effective Public Speaking, Group Discussions and Interviews, by Pushpa Lata & Kumar, Prentice-Hall of India.
6. Learn Correct English, Grammar, Usage and Composition by Shiv. K. Kumar & Hemalatha Nagarajan, Pearson Longman
7. Spoken English by R. K. Bansal & J. B. Harrison, Orient Longman.
8. English Language Communication: A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr. G. Natanam & Prof. S. A. Sankaranarayanan, Anuradha Publications, Chennai.
9. Effective Technical Communication, M. Ashraf Rizvi, Tata McGraw-Hill.
10. A Practical Course in English Pronunciation, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
11. A text book of English Phonetics for Indian Students by T. Balasubramanian, Mac Millan
12. Spoken English: A foundation Course, Parts 1 & 2, Kamlesh Sadanand and Susheela Punitha, Orient Longman

DISTRIBUTION AND WEIGHTAGE OF MARKS**English Language Laboratory Practical Paper:**

- 1) The practical examinations for the English Language Laboratory shall be conducted as per the norms prescribed for the core engineering practical sessions.
- 2) For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-end Examination marks. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The year-end Examination shall be conducted by an external examiner/ or the teacher concerned with the help of another member of the staff of the same department of the same institution.

2012-16

Code: 20304

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech

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ENGINEERING WORKSHOP / IT WORKSHOP
(Common for CE, EEE, ME, ECE, CSE & IT)

ENGINEERING WORKSHOP

1. TRADES FOR EXERCISES:

At least two exercises from each trade:

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. House-wiring.
5. Foundry.
6. Machine Shop.

2. TRADES FOR DEMONSTRATION & EXPOSURE:

1. Power Tools in construction, wood working, electrical engineering and mechanical engineering.
2. Plumbing.

TEXT BOOK:

1. Work Shop Manual – P. Kanniah/ K. L. Narayana, Scitech Publishers.
2. Work Shop Manual by Venkat Reddy
3. Work Shop Practice Manual by K. Venkat Reddy, B.S. Publishers.

IT WORKSHOP

OBJECTIVES:

The IT Workshop for engineers is a training lab course spread over 54 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel and Power Point

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered. The students should work on working PC to disassemble and assemble to working condition and install Windows and Linux on the same PC. Students are suggested to work similar tasks in the Laptop scenario wherever possible.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, Le., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets and power point presentations using the Microsoft suite of office tools (**Recommended to use Microsoft office 2007 in place of MS Office 2003**)

PC HARDWARE

Week 1 - Task 1 : Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral and submit to your instructor.

Week 2 - Task 2 : Every student should disassemble and assemble the PC back to working condition. Lab instructors should verify the work and follow it up with a Viva. Also students need to go through the video which shows the process of assembling a PC. A video would be given as part of the course content.

Week 3 - Task 3 : Every student should individually install MS windows on the personal computer. Lab instructor should verify the installation and follow it up with a Viva.

Week 4 - Task 4 : Every student should install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux. Lab instructors should verify the installation and follow it up with a Viva

Week 5 - Task 5 : Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva

Week 6 - Task 6 : Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

PRODUCTIVITY TOOLS

Microsoft Word

Week 7 - Word Orientation: The mentor needs to give an overview of Microsoft (MS) office 2007 word: Importance of Word as word Processors, Details of the three tasks and features that would be covered in each, using word - Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter.

Task 1 : Microsoft Word to create project certificate. Features to be covered:-Formatting Fonts in word, Drop Cap in word, Applying Text effects, Using Character Spacing, Borders and Colors, Inserting Header and Footer, Using Date and Time option in Word.

Week 8 - Task 2 : Creating project abstract Features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Creating a Newsletter: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes, Paragraphs and Mail Merge in word.

Microsoft Excel

Week 9 - Excel Orientation: The mentor needs to tell the importance of MS office 2007 Excel as a Spreadsheet tool, give the details of the two tasks and features that would be covered in each. Using Excel - Accessing, overview of toolbars, saving excel files, Using help and resources.

Task 1: Creating a Scheduler - Features to be covered:- Gridlines, Format Cells, Summation, auto fill, Formatting Text

Microsoft Power Point

Week 10 - Task1 : Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week

includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in Power point. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Week 11- Task 2 : Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting -Images, Clip Art, Audio, Video, Objects, Tables and Charts

Week 12 - Task 3 : Concentrating on the in and out of Microsoft power point and presentations Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes :- Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting - Background, textures, Design Templates, Hidden slides.

REFERENCES:

1. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
2. Introduction to Computers, Peter Norton, 6/e Mc Graw Hill
3. Upgrading and Repairing, PC's 18th e, Scott Muller QUE, Pearson Education
4. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
5. IT Essentials PC Hardware and Software Companion Guide Third Edition by David Anfinson and Ken Quamme. - CISCO Press, Pearson Education.
6. PC Hardware and A+Handbook - Kate J. Chase PHI (Microsoft)

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MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech EEE I-Sem

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MATHEMATICS – III

UNIT-I: Special Functions I:

Review of Taylor's series for a real many valued functions, Series Solutions of Differential equations, Gamma and Beta Functions-their Properties-Evaluation of improper Integrals. Bessel Functions- Properties-Recurrence relations-Orthogonality.

UNIT-II: Special Functions II:

Legendre Polynomials-Properties-Rodriguez's Formula-Recurrence Relations-Orthogonality. Chebchey's Polynomials-Properties-recurrence relations-Orthogonality.

UNIT-III: Functions of complex variable:

Continuity-differentiability-Analyticity-Properties-Cauchy-Riemann conditions, Maxima-minima Principle, Harmonic and conjugate Harmonic Functions-Milne-Thomson Method. Elementary Functions, General Power z^6 Principal value Logarithmic Function.

UNIT-IV: Complex Integration:

Line Integral-Evaluation along a path and by indefinite Integration-Cauchy's Integral Theorem-Cauchy's Integral formula-Generalized Integral Formula.

UNIT-V: Complex Power Series:

Radius of convergence-Expansion in Taylor's Series, Maclaurian series and Laurent series. Singular Point-Isolated Singular Point-Pole Of Order m-Essential Singularity (Distinction between the Real Analytical and complex analyticity)

UNIT-VI : Contour Integration:

Residue-Evaluation of residue by formula and by Laurent Series-residue theorem. Evaluation of the type

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

(c) $\int_{-\infty}^{\infty} e^{imx} f(x)dx$ (d) Integrals by indentation.

UNIT -VII Conformal Mapping:

Transformation by $e^z, \ln z, z^2, z^n$ (n positive integer), $\sin z, \cos z, z + \frac{a}{z}$. Translation, rotation, inversion and bilinear transformation-fixed point-cross ratio-properties -invariance of circles and cross ratio-determination of bilinear transformation mapping 3 given points.

UNIT-VIII

Elementary graph Theory: Graphs, Representation by matrices, adjacent matrix-incident-Sample, Multiple, Regular, Complete, Bipartite & Planar Graphs-Hamiltonian and Circuits-Tress Spanning tree -minimum spanning tree.

TEXT BOOKS:

1. Engineering Mathematics-III by Krishna Gandhi & others S.Chand & Co.,
2. Engineering Mathematics-III by C.Shankaraiah, V.G.S.Book Links

REFERENCES:

1. Higher Engineering of Mathematics by B.S.Grewal Khanna Publications.
2. Advanced Engineering of Mathematics by Jain & S.R.K.Iyenger, Narosa publications.
3. Complex Variables by R.K.Churchill.
4. Advanced Engineering of Mathematics by Allen Jaffrey Academic press.
5. Functions of one complex variable – John B. Conway, Narosa Publications.

2012-16

MALLA REDDY ENGINEERING COLLEGE
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Code: 20339

II Year B.Tech EEE I-Sem

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FLUID MECHANICS AND HYDRAULIC MACHINERY

UNIT I

Fluid statics: Dimensions and units: physical properties of fluids- specific gravity, viscosity surface tension- vapor pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure –measurement of pressure- Piezometer, U-tube and differential manometers.

UNIT II

Fluid kinematics: Stream line, path line and streak lines and stream tube, classification of flows-steady & unsteady, uniform, non uniform, laminar, turbulent, rotational, and irrotational flows-equation of continuity for one dimensional flow.

Fluid dynamics: Surface and body forces –Euler’s and Bernoulli’s equations for flow along a stream line, momentum equation and its application on force on pipe bend.

UNIT III

Closed conduit flow: Reynold’s experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line. Measurement of flow- pitot tube, venturimeter, and orifice meter, Flow nozzle.

UNIT IV

Basics of turbo machinery: Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work done and efficiency, flow over radial vanes.

UNIT V

Hydro Electric Power Stations: Elements of Hydro Electric Power Station- Types-Concept of Pumped storage Plants-Storage requirements, Mass Curve (explanation only) estimation of power developed from a given catchment area, heads and efficiencies.

UNIT VI

Hydraulic Turbines : Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design –draft tube theory- functions and efficiency.

UNIT VII

Performance of hydraulic turbines: Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer.

UNIT VIII

Centrifugal pumps: Classification, working, work done – manometric head- losses and efficiencies, specific speed-pumps in series and parallel-performance characteristic curves, NPSH.

Reciprocating pumps: Working principle, Discharge, slip and slip percentage.

TEXT BOOKS:

1. Hydraulics, fluid mechanics and Hydraulic machinery MODI and SETH.
2. Fluid Mechanics and Hydraulic Machines by Rajput.

REFERENCES:

1. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar, Kotaria & Sons.
2. Fluid Mechanics and Machinery by D. Rama Durgaiiah, New Age International.
3. Hydraulic Machines by Banga & Sharma, Khanna Publishers.
4. Instrumentation for Engineering Measurements by James W. Dally, William E. Riley ,John Wiley & Sons Inc. 2004 (Chapter 12 – Fluid Flow Measurements).

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MALLA REDDY ENGINEERING COLLEGE
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Code: 20401

II Year B.Tech EEE I-Sem

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ELECTRONIC DEVICES AND CIRCUITS

UNIT-I: P-N Junction Diode:

Qualitative Theory of p-n Junction. P-n Junction as a Diode, Diode Equation. Volt-Ampere Characteristics, Temperature dependence of V I Characteristics. Ideal versus Practical Resistance levels (static and dynamic), Transition and diffusion capacitances. Diode Equivalent circuits, Load Line Analysis, Breakdown Mechanisms in semiconductor diodes, Zener diode characteristics.

UNIT- II: Rectifiers and Filters

The p-n junction as a rectifier, half wave rectifiers, full wave rectifiers, bridge rectifiers harmonic components in a rectifier circuit. Inductor filters, capacitor filters, L –section filters, d- section filters, composition of filters, voltage regulation using zener diode.

UNIT- III: Bipolar Junction Transistor:

The junction transistor, transistor current components. Transistor as an amplifier. Transistor construction. BJT operation, BJT symbol, common base, common emitter and common collector configuration, limits of operation , BJT specification.

UNIT- IV: Transistor Biasing and Stabilization

Operating point, the DC and AC load lines. Need for biasing . fixed bias . collector feedback bias. Emitter feedback bias, collector-emitter feedback bias. Voltage divider bias. Bias stability. Stabilization factors. Stabilization against variations in V_{BE} and . Bias compensation using diodes and transistors . thermal runaway, thermal stability.

UNIT-V: Small Signal Low Frequency BJT Models

BJT hybrid model, determination of h-parameters from transistor characteristics. Analysis of a transistor amplifier circuit using h-parameters. Comparison of CB, CE, and CC amplifiers, configurations.

UNIT- VI: Field Effect Transistor

The Junction field effect transistor (construction, principle of operation, symbol) pinch of voltage, voltage-ampere characteristics, the JFET small signal model, MOSFET construction, principle of operation, symbol), MOSFET characteristics in enhancement and depletion modes.

UNIT- VII: FET AMPLIFIERS

FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT, and FET., Uni junction Transistor.

UNIT-VIII

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

TEXT BOOKS :

1. Millman s Electronic Devices and Circuits J.Millman, C.C.Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed., 1998 . TMH
2. Electronic Devices and Circuits R.L. Boylestad and Louis Nashelsky, pearson/Prentice Hall,9th Edition,2006.
3. Introduction to electronic devices and circuits-r obert t painter PE.

REFERENCES :

1. Integrated electronics J.Millman and Christos c halkias 1991, 2008, TMH.
2. Electronic Devices and Circuits Dr. K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
3. Electronic Devices and Circuits Anil k maini , varsha agarwal , 2009 WIPL
4. Electronic Devices and Circuits s salivahana n suresh kumar, a vallavaraj 2008 TMH.

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MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech EEE I-Sem

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ELECTRICAL CIRCUITS

Objective :

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

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 (the diff input signals, square , ramp, saw tooth, triangular)- problems

UNIT – II

Kirchhoff's laws - network reduction techniques - series, parallel, series parallel, star-to-delta or delta-to-star transformation. Nodal analysis, mesh analysis, super node and super mesh for D-C excitation. problems

UNIT - III Single Phase A.C Circuits

R.M.S and Average values and form factor and peak 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, concept of power triangle - J-notation, Complex and Polar forms of representation, Complex power, problems

UNIT - IV Locus diagrams & Resonance

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

UNIT - V Magnetic Circuits

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

UNIT - VI Network topology:

Definitions - Graph - Tree, Basic cutset and Basic Tieset matrices for planar networks - Loop and Nodal methods of analysis of Networks with independent voltage and current sources - Duality & Dual networks, problems

UNIT - VII Network theorems (with D.C)

Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for DC excitations, problems

UNIT - VIII Network theorems (with A.C)

Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for AC excitations, problems

TEXT BOOKS:

1. Engineering circuit analysis by William Hayt and Jack E. Kemmerly McGraw Hill 6th edition.
2. Circuits & networks by A. Sudhakar and Shyam Mohan A. Palli, TMH
3. Electric circuits by A. Chakravarty, Dhanipati Rai & Sons - 6th edition

REFERENCE BOOKS:

1. Network analysis by M. E. Van Valkenberg - 3rd edition - 1974.
2. Linear circuit analysis (time domain phasor and Laplace transform approaches) second ed. By Raymond A. DeCarlo Oxford Press 2004
3. Network theory N. C. Jagan & C. Lakshminarayana 2006, BSP.
4. Electric circuit theory by K. Rajeshwaran, Pearson Education 2004
5. Basic circuit analysis by D. R. Cunningham & J. A. Stuller, Jaico

ELECTROMAGNETIC FIELDS

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, $\text{div}(\mathbf{D}) = \rho_v$

UNIT – II **Conductors and Dipole:**

Laplace’s and Poisson’s equations – Solution of Laplace’s equation in one variable. Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behaviour of conductors in an electric field – Conductors and Insulators, problems on electric dipole and field intensity.

UNIT – III **Dielectric & Capacitance :**

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, simple problems on capacitance and energy.

UNIT – IV **Magneto Statics :**

Static magnetic fields – Biot-Savart’s law – Oesterd’s experiment - 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, $\text{div}(\mathbf{B})=0$.

UNIT – V **Ampere’s circuital law and its applications**

Ampere’s circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere’s circuital law – Maxwell’s third equation, $\text{Curl}(\mathbf{H}) = \mathbf{J}_c$, Field due to a circular loop, rectangular and square loops and polygon.

UNIT – VI **Force in Magnetic fields:**

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

UNIT – VII **Magnetic Potential:**

Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson’s equations. Self and Mutual inductance – Neumann’s formulae – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field. Introduction to permanent magnets, their characteristics and applications, simple problems on inductance and magnetic energy.

UNIT – VIII Time Varying Fields :

Time varying fields – Faraday’s laws of electromagnetic induction – Its integral and point forms – Maxwell’s fourth equation, $\text{Curl } (E) = -\partial B / \partial t$ – 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-3rd edition-2004

REFERENCE BOOKS:

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

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MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

Code: 20203

II Year B.Tech EEE I-Sem

L T/P/D C
4 -/1/- 4

ELECTRICAL MACHINES – I

Objective :

Electrical machines course is one of the important courses of the Electrical discipline. In this course the different types of DC generators and motors which are widely used in industry are covered and their performance aspects will be studied.

UNIT – I Electromechanical Energy Conversion

Electromechanical Energy conversion – coupling field reaction- forces and torque in magnetic field systems – energy balance equation – energy and force in a singly excited magnetic field system, determination of magnetic force - co-energy – multi excited magnetic field systems.

UNIT – II D.C. Generators – Construction & Operation

D.C. Generators – Principle of operation – Action of commutator – constructional features & essential parts– armature windings – lap and wave windings – simplex and multiplex windings, dummy coils – use of laminated armature – E. M.F Equation – Problems

UNIT – III Armature reaction in D.C. Generator

Armature reaction – Cross magnetizing and de-magnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation and interpoles.

UNIT – IV Types of D.C Generators

Methods of Excitation – separately excited and self excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self excite and remedial measures and problems.

UNIT – V Load Characteristics of Generators

Load characteristics of shunt, series and compound generators – parallel operation of d.c series generators – use of equalizer bar and cross connection of field windings – load sharing, problems.

UNIT – VI D.C. Motors

D.C Motors – Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation.

UNIT – VII Speed control of D.C. Motors

Speed control of d.c. Motors: Armature voltage and field flux control methods. Ward-Leonard system.Principle of 3 point and 4 point starters – protective devices.

UNIT – VIII Testing of D.C. Machines

Testing of d.c. machines: Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency.

Methods of Testing – direct, indirect and regenerative testing – brake test – Swinburne's test – Hopkinson's test – Field's test – Retardation test – separation of stray losses in a d.c. motor test, problems.

TEXT BOOKS:

1. Electric Machinery – A. E. Fitzgerald, C. Kingsley and S. Umans, Mc Graw-Hill Companies, 5th edition.
2. Electrical Machines – P.S. Bimbra., Khanna Publishers-6th edition-2003.

REFERENCE BOOKS:

1. Performance and Design of D.C Machines – by Clayton & Hancock, BPB Publishers-1st edition-1990.
2. Electrical Machines -S.K. Battacharya,
3. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers, 3rd edition, 2004.
4. Electromechanics – I (D.C. Machines) S. Kamakshaiiah Hi-Tech Publishers- Revised edition-2005.

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MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

Code: 20340

II Year B.Tech EEE I-Sem

L T/P/D C
- -/3/- 2

FLUID MECHANICS AND HYDRAULIC MACHINES LAB

1. Impact of jets on Vanes
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine
4. Performance Test on Kaplan Turbine
5. Performance Test on Single Stage Centrifugal Pump
6. Performance Test on Multi Stage Centrifugal Pump
7. Performance Test on Reciprocating Pump
8. Calibration of Venturimeter
9. Calibration of Orifice meter.
10. Determination of friction factor for a given pipe line.
11. Determination of loss of head due to sudden contraction in a pipeline.
12. Turbine flow meter.

Note: Any 10 of the above 12 experiments are to be conducted.

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MALLA REDDY ENGINEERING COLLEGE
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Code: 20404

II Year B.Tech EEE I-Sem

L T/P/D C
- /3/- 2

ELECTRONIC DEVICES AND CIRCUITS LAB

PART A : (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 3 lab sessions) :

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Low power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, SCR, UJT
3. Study and operation of
 - Multimeters (Analog and Digital)
 - Function Generator
 - Regulated Power Supplies
 - CRO

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

1. PN Junction diode characteristics A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Transistor CB characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Half wave Rectifier with & without filters
6. Full wave Rectifier with & without filters
7. FET characteristics
8. Measurement of h parameters of transistor in CB, CE, CC configurations
9. Frequency Response of CE Amplifier
10. Frequency Response of CC Amplifier
11. Frequency response of Common Source FET amplifier
12. SCR Characteristics

13. UJT Characteristics

PART C:

Equipment required for conducting experiments:

1. Regulated Power supplies (RPS) - 0-30v
2. CROs - 0-20M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Micro Ammeters (Analog or Digital) - 0-20 QA, 0-50QA, 0-100QA, 0-200QA
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V
9. Electronic Components - Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs, FETs, LEDs, MOSFETs, diodes (germanium & silicon type), transistors (npn & pnp type)

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MALLA REDDY ENGINEERING COLLEGE
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Code: 20B01

II Year B.Tech EEE II-Sem

L T/P/D C
4 -/- 4

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Unit I Introduction to Managerial Economics:

Definition, Nature and Scope of Managerial Economics–Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

Unit II Elasticity of Demand:

Definition, Types, Measurement and Significance of Elasticity of Demand. Demand Forecasting, Factors governing demand forecasting, methods of demand forecasting (survey methods, statistical methods, expert opinion method, test marketing, controlled experiments, judgmental approach to demand forecasting)

Unit III Theory of Production and Cost Analysis:

Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.

Cost Analysis: Cost concepts, Opportunity cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

Unit IV Introduction to Markets & Pricing Policies:

Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly.

Objectives and Policies of Pricing- Methods of Pricing: 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 Business & New Economic Environment:

Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.

Unit VI 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 VII 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).

Unit VIII 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, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

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

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.
6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson.
7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI.
8. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech.
9. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas.
10. Truet and Truet: Managerial Economics:Analysis, Problems and Cases, Wiley.
11. Dwivedi:Managerial Economics, 6th Ed., Vikas.

Prerequisites: Nil

Objective: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

Codes/Tables: Present Value Tables need to be permitted into the examinations Hall.

Question Paper Pattern: 5 Questions to be answered out of 8 questions.

Each question should not have more than 3 bits.

2012-16

Code: 20204

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

II Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

POWER SYSTEMS-I

Objective :

Electrical Power plays significant role in day to day life of entire mankind. This course concerns the generation and distribution of power along with the economic aspects.

UNIT-1 Thermal Power Stations

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

UNIT-2 Gas and Nuclear Power Stations

Nuclear Power Stations: Nuclear Fission and Chain reaction.- Nuclear fuels.- Principle of operation of Nuclear reactor.-Reactor Components: Moderators, Control rods, Reflectors and Coolants.- Radiation hazards: Shielding and Safety precautions.- Types of Nuclear reactors and brief description of PWR, BWR and FBR.

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

UNIT-3 General Aspects of Distribution Systems and D.C. Distribution Systems

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

Unit-4 A.C. Distribution Systems.

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

Unit-5 Substations.

Classification of substations: **Air insulated substations** - Indoor & Outdoor substations: Substations layout showing the location of all the substation equipment. Bus bar arrangements in the Sub-Stations: Simple arrangements like single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams.

Gas insulated substations (GIS) – Advantages of Gas insulated substations, different types of gas insulated substations, single line diagram of gas insulated substations, bus bar, construction aspects of GIS, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations.

UNIT-6 Power factor and Voltage Control

Causes of low p.f -Methods of Improving p.f -Phase advancing and generation of reactive KVAR using static Capacitors-Most economical p.f. for constant KW load and constant KVA type loads, Numerical Problems.

Dependency of Voltage on Reactive Power flow.- Methods of Voltage Control: Shunt Capacitors, Series Capacitors, Synchronous Capacitors, Tap changing and Booster Transformers

UNIT-7 Economic Aspects of Power Generation

Load curve, load duration and integrated load duration curves-load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems.

Unit-8 Tariff Methods

Costs of Generation and their division into Fixed, Semi-fixed and Running Costs.Desirable Characteristics of a Tariff Method.-Tariff Methods: Flat Rate, Block-Rate, two-part, three –part, and power factor tariff methods and Numerical Problems

TEXT BOOKS

1. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti, Dhanpat Rai & Co. Pvt. Ltd., 1999.
2. Principles of Power Systems by V.K Mehta and Rohit Mehta S.CHAND& COMPANY LTD., New Delhi 2004.

REFERENCE BOOKS

1. Elements of Power Station design and practice by M.V. Deshpande, Wheeler Publishing -3rd edition-1986.
2. Electrical Power Systems by C.L.Wadhawa New age International (P) Limited, Publishers 1997.
3. Electrical Power Generation, Transmission and Distribution by S.N.Singh., PHI, 2003.
4. Gas turbine performance, by PP Wals, P.Fletcher, Blackwell Publisher, 2004.

2012-16

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

Code: 20433

II Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

ELECTRONIC CIRCUITS

UNIT I : SINGLE STAGE AMPLIFIERS DESIGN AND ANALYSIS :

Review of CE, CB,CC&CS amplifiers- Classification of Amplifiers, Distortion in amplifiers-Approximate analysis,CE, CB,CC amplifiers comparison.

UNIT II : BJT & FET FREQUENCY RESPONSE

Logarithms-Decibels-General frequency consideration-Low frequency analysis-Low frequency response of BJT amplifiers-low frequency response of FET amplifier-Miller effect capacitance-High frequency response of BJT amplifier-square wave testing

UNIT III: FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on amplifier characteristics, Voltage series, voltage shunt, current series, and current shunt feedback configuration –simple problems

UNIT IV: OSCILLATORS: Condition for oscillations. RC& LC oscillators, Crystal oscillators Frequency and amplitude stability of oscillators.Generalized analysis of LC oscillators, Quartz, Hartley and Colpitts oscillators, RC phase shift & Wien bridge oscillator,

UNIT V : LARGE SIGNAL AMPLIFIERS : Class A Power Amplifier, Maximum Value of Efficiency of Class A Amplifier, Transformer Coupled Amplifier, Transformer Coupled Audio Amplifier, Push Pull Amplifier, Complimentary Symmetry Circuits (Transformer Less Class B Power Amplifier), Phase Inverters, Class D Operation, Class S Operation, Heat Sinks.

LINEAR WAVE SHAPING

High pass, low pass RC Circuits, their response for sinusoidal, step, pulse, square and ramp inputs

UNIT VI: CLIPPERS ANDCLAMPERS:

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.

UNIT VII: SWITCHING CHARACTERISTICS OF DEVICES:

Diode and Transistor as switches, Break down voltage consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

UNIT VIII: MULTIVIBRATORS: Analysis & design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors.

TEXT BOOKS :

1. Electronic Devices 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-1992

REFERENCES:

1. Introductory Electronic Devices and circuits (Conventional flow version)- Robert T. Paynter, 7th Edition, 2009,PEI
2. Electronic Devices and Circuits, Anil K. Maini, Varsha Agarwal, 1st Edition, WILEY.
3. Pulse, Digital & Switching Waveforms by Jacob Mlliman, Harbert Taub and Mothiki S Prakash Rao, 2nd edition 2008, Tata McGraw Hill Companies.

2012-16

Code: 20109

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

II Year B.Tech EEE II-Sem

L T/P/D C
4 -/1/- 4

ENVIRONMENTAL STUDIES

UNIT-I : ECOSYSTEMS: Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classifications of ecosystem, Structure and Structural Components of an ecosystem, Functions of ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Homeostasis / Cybernetics, Food chain concentration, Biomagnification, ecosystems value, services and carrying capacity.

UNIT-II: NATURAL RESOURCES: Classification of Resources: Living and Non-Living resources, Renewable and non-renewable resources. Water resources use and over utilization of surface and ground water, floods and droughts, Dams: benefits and problems. Mineral resources: use and exploitation, environmental effects of extracting and using mineral resources- case studies. Energy resources: growing energy needs, renewable and non renewable energy sources, use of alternative energy sources – case studies. Land resources: land as a resource, land degradation, man induced landslides and land use / land cover mapping.

UNIT-III: BIODIVERSITY AND BIOTIC RESOURCES: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity: consumptive use, social, ethical, aesthetic and intrinsic values. Hot spots of biodiversity. Threats to biodiversity: habit loss, poaching of wildlife, man-wildlife conflicts, conservation of biodiversity: In-Situ and Ex-situ conservation. Food and fodder resources, Timber and non-timber forest products.

UNIT-IV: ENVIRONMENTAL POLLUTION AND CONTROL: Classification of pollution and pollutants, causes, effects and control technologies. Air Pollution: Primary and secondary pollutants, Automobile and Industrial pollution, Ambient air quality standards. Water pollution: point and non-point sources of pollution, Major pollutant of water and their sources, drinking water quality standards, Waste water treatment methods: effluent treatment plants (ETP), Sewage treatment plants (STP), common and combined effluent treatment plants (CEPT). Soil pollution: Soil as sink for pollutants, Impact of modern agriculture on soil, degradation of soil. Marine Pollution: Misuse of International water for dumping of hazardous waste, coastal pollution due to sewage and marine disposal of industrial effluents. Noise Pollution: Sources, Industrial Noise- Occupational Health hazards, standards, Methods of control of Noise. Thermal Pollution: Thermal Comforts, Heat Island effect, Radiation effects, Nuclear Pollution: Nuclear power plants, nuclear radiation, disasters and impacts, genetical disorders. Solid waste: types, Collection processing and disposal of industrial and municipal solid wastes composition and characteristics of e-waste and its management.

UNIT-V: GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS: Green house effect, Green Houses Gases (GHG), Global Warming, Sea level rise, climatic change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and Montreal Protocol.

UNIT-VI: ENVIRONMENTAL IMPACT ASSESSMENT (EIA) AND ENVIRONMENTAL MANAGEMENT PLAN: Definition of Impact: classification of impacts, Positive and Negative, Reversible and irreversible, light, moderate and severe, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society. Prediction of impacts and impact assessment methodologies. Environmental Impact Statement (EIS). Environmental Management plan (EMP): Technological Solutions, preventive methods, Control technologies, treatment technologies: green-belt-development, rain water harvesting, Remote sensing and GIS methods.

UNIT-VII: ENVIRONMENTAL POLICY, LEGISLATION,RULES AND REGULATIONS: National Environmental Policy, Environmental Protection act, Legal aspects Air (Prevention and Control of Pollution) Act-1981, Water(Prevention and control of pollution) Act-1974, Water pollution Cess Act- 1977, Forest Conservation Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules.

UNIT-VIII- TOWARDS SUSTAINABLE FUTURE: Concept of Sustainable Development, Threats to Sustainability, Population and its explosion, Crazy Consumerism,Over-exploitation of resources, Strategies for Achieving Sustainable development, Environmental Education, Conservation of Resources, Urban Sprawl, Sustainable Cities and Sustainable Communities, Human health, Role of IT in Environment, Environmental Ethics, Environmental Economics, Concept of Green Building, Clean Development Mechanism(CDM).

TECT BOOKS:

1. Environmental studies, From crisis to cure by R.Rajagopalan,2005
2. Text book of Environmental Science and Technology by M.Anji Reddy 2007
3. Environmental studies by Erach Bharuchu 2005, University Grants Commission, University press.

REFERENCE BOOKS:

1. Environmental Science towards a sustainable future by Richard T. Wright 2008 PHL Learning private Ltd. New Delhi.
2. Environmental Engineering and science by Gilbert M>Masters and Wendell P.Ela.2008 PHI Learning Pvt Ltd.

2012-16

MALLA REDDY ENGINEERING COLLEGE
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Code: 20205

II Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

NETWORK THEORY

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& unbalanced three phase circuits- Measurement of Active and Reactive power in balanced three phase systems.

UNIT-II D.C Transient Analysis

Transient response of R-L, R-C, R-L-C series series& parallel circuits for D.C excitation-Initial conditions- solution method using differential equation and laplace transforms

UNIT-III A.C Transient Analysis

Transient response of R-L, R-C, R-L-C series& parallel circuits for sinusoidal excitations-Initial conditions-Solution method using differential equations and Laplace transforms

UNIT IV Network Functions: the concept of complex frequency, physical interpretation of complex frequency, transform impedance and transform circuit, series and parallel combination of element, terminal pairs or ports, network functions for one port and two port, poles and zeroes of network functions, significance of poles and zeros, properties of driving point functions, properties of transfer functions, necessary condition for driving point function , necessary condition for transfer functions, time domine response from pole zero plot.

UNIT-V Two Port Networks - I

Two port network parameters – Z, Y, ABCD and hybrid parameters and their relations.

UNIT-VI Two Port Networks -II

Cascaded networks Concept of transformed network - 2port network parameters using transformed variables.

UNIT VII Filters

Low Pass, High Pass, Band Pass, Band Elimination, Prototype filters design

UNIT-VIII Fourier analysis of A.C Circuits

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

TEXT BOOKS :

1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, 3rd Edition, 2000.
2. Networks, Lines and Fields - JD Ryder, PHI, 2nd Edition, 1999.
3. Engineering Circuit Analysis by William Hayt and Jack E. Kemmerley, Mc Graw Hill Company, 6th edition

REFERENCES :

1. Network Analysis – N.C. Jagan and C. Lakshminarayana, B.S. Publications, 2006.
2. Electric Circuits – J. Edminister and M. Nahvi – Schaum's Outlines, TMH, 1999.
3. Electrical circuits by A. Chakraborthy, Dhanpath Rai & Co-6th edition-2010.

2012-16

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

Code: 20206

II Year B.Tech EEE II-Sem

L T/P/D C
4 -/1/- 4

ELECTRICAL MACHINES – II

Objective :

As an extension of Electrical machines I course this subject facilitates to study of the performance of Transformers and Induction motors which are the major part of industrial drives and agricultural pump sets.

UNIT-I Single Phase Transformers – Construction & Operation

Single phase transformers-types - constructional details-principle of operation of transformer and EMF equation-minimization of hysteresis and eddy current losses- operation on no load and on load - phasor diagrams

UNIT-II Single Phase Transformers - Performance

Equivalent circuit - losses and efficiency-regulation. All day efficiency - effect of variations of frequency & supply voltage on iron losses.

UNIT-III Testing of Single Phase Transformer and Autotransformer

OC and SC tests - Sumpner's test - predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios - auto transformers-equivalent circuit - comparison with two winding transformers.

UNIT-IV Polyphase Transformers

Polyphase transformers - Polyphase connections - Y/Y, Y/ Δ , Δ /Y, Δ / Δ and open Δ , Third harmonics in phase voltages-three winding transformers-tertiary windings-determination of Z_p , Z_s and Z_t transients in switching - off load and on load tap changing; Scott connection.

UNIT-V Polyphase Induction Motors

Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor emf and rotor frequency - rotor reactance, rotor current and pf at standstill and during operation.

UNIT-VI Characteristics of Induction Motors

Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation- deduction from torque equation - expressions for maximum torque and starting torque - torque slip characteristic - double cage and deep bar rotors - equivalent circuit - phasor diagram - crawling and cogging

UNIT-VII Circle Diagram of Induction Motors

Circle diagram-no load and blocked rotor tests-predetermination of performance-methods of starting and starting current and torque calculations

UNIT-VIII Speed Control Methods

Speed control-change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation.

TEXT BOOKS:

1. Electric machinery - A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill Companies, 5th edition,2003.
2. Electrical machines-PS Bhimbra, Khanna Publishers-6th edition-2003.

REFERENCE BOOKS:

1. Performance and Design of AC Machines by MG.Say, BPB Publishers-2000.
2. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition 1990.
3. Electric Machines –by I.J.Nagrath & D.P.Kothari,Tata Mc Graw Hill, 7th Edition.2005
4. Electromechanics-II (transformers and induction motors) S. Kamakashaiah Hitech publishers

2012-16

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

Code: 20207

II Year B.Tech EEE II-Sem

L T/P/D C
- -/3/- 2

ELECTRICAL MACHINES LAB – I

The following EIGHT experiments are to be compulsorily conducted:

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.
2. Load test on DC shunt generator. Determination of characteristics.
3. Load test on DC series generator. Determination of characteristics.
4. Load test on DC compound generator. Determination of characteristics.
5. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
6. Fields test on DC series machines. Determination of efficiency.
7. Swinburne's test and speed control of DC shunt motor. Predetermination of efficiencies.
8. Brake test on DC compound motor. Determination of performance curves.

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

9. Brake test on DC shunt motor. Determination of performance curves.
10. Retardation test on DC shunt motor. Determination of losses at rated speed.
11. Separation of losses in DC shunt motor.

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II Year B.Tech EEE II-Sem

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ELECTRICAL CIRCUITS AND SIMULATION LAB

PART-A: ELECTRICAL CIRCUITS (Any Eight experiments are to be conducted)

- 1) Thevenin's, Norton's and Maximum Power Transfer Theorems
- 2) Superposition theorem and RMS value of complex wave
- 3) Verification of Compensation Theorem
- 4) Reciprocity, 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) Z and Y Parameters
- 9) 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: PSPICE SIMULATION (Any Two experiments are to be conducted)

- 1) Simulation of DC Circuits
- 2) DC Transient response
- 3) Mesh Analysis
- 4) Nodal Analysis

NOTE:

- PSPICE Software Package is necessary.

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MALLA REDDY ENGINEERING COLLEGE
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3 -/1/- 3

IC APPLICATIONS

Part-1 : LINEAR INTEGRATED CIRCUITS

UNIT I: INTEGRATED CIRCUITS

Moore's Law, Classification, 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 of Op-amp, applications of Op-amp.

UNIT II: OP-AMP APPLICATIONS

Instrumentation amplifier, ac amplifier, V to I and I to V converters, sample & hold circuits, multipliers and dividers, Differentiators and Integrators, Comparators, Schmitt trigger, Multivibrators, introduction to voltage regulators, features of 723.

UNIT III: ACTIVE FILTERS & OSCILLATORS

Introduction, 1st order LPF, HPF filters. Band pass, Band reject and all pass filters (Butter worth and cheybshev fitter). Oscillator types and principle of operation – RC, Wien and quadrature type, waveform generators – triangular, saw tooth, square wave and VCO.

UNIT IV: TIMERS & PHASE LOCKED LOOPS

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

Part-2: DATA CONVERTER INTEGARTOR CIRCUIT IC's

UNIT V: 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.

Part-3: DIGITAL INTEGRATED CIRCUITS

UNIT VI: INTRODUCTION

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

UNIT VII: COMBINATIONAL CIRCUITS

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

UNIT VIII: SEQUENTIAL CIRCUITS

Flip-flops & their interrelationships. Design of synchronous counters. Decade counter, shift registers & applications, familiarities with commonly available 74XX & CMOS 40XX series of IC counters.

TEXT BOOKS

1. Linear Integrated Circuits –D. Roy Chowdhury, New Age International (p) Ltd, 2nd Ed., 2003.
2. Op-Amps & Linear ICs – Ramakanth A. Gayakwad, PHI, 1987.
3. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Edition, 2005.

REFERENCES:

1. Operational Amplifiers and Linear Integrated Circuits – R.F. Coughlin and Fredrick F. Driscoll, PHI, 1977.
2. Op Amps & linear integrated circuits – concepts and applications James M.Fiore cengage learning 2009.
3. Operating Amplifiers and Linear Integrated Circuits:4/e William D Stanley PEI 2009.
4. Operational Amplifiers and Linear Integrated Circuits: Theory and Applications –Denton J. Daibey, TMH.
5. Operational Amplifiers and Linear Integrated Circuits K.Lal Kishore pearson 2008.
6. Modern Digital Electronics RP Jain 4/e TMH 2010.
7. Design with Operational Amplifiers and Analog Integrated Circuits - Sergio Franco, McGraw Hill, 3rd Ed., 2002.

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MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE I-Sem

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3 -/1/- 3

ELECTRICAL MEASUREMENTS

UNIT-I Measuring Instruments

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

UNIT –II Instrument transformers

- a) CT and PT – Ratio and phase angle errors – design considerations and testing of CT & PT
- b) Types of P.F. Meters – dynamometer and moving iron type – 1-ph and 3-ph meters – Frequency meters – resonance type and Weston type – synchrosopes.

UNIT –III Measurement of Power

Single phase dynamometer wattmeter, LPF and UPF, Double element and three element dynamometer wattmeter, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers – Measurement of active and reactive powers in balanced and unbalanced systems.

UNIT –IV Measurement of Energy

Single phase induction type energy meter – driving and braking torques – errors and compensations – testing by phantom loading using R.S.S. meter. Three phase energy meter – trivector meter, maximum demand meters.

UNIT – V Potentiometers

Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage.A.C. Potentiometers: polar and coordinate types standardization – applications.

UNIT – VI Resistance Measurements

Method of measuring low, medium and high resistance – sensitivity of Wheatstone's bridge – Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, measurement of high resistance – loss of charge method.

UNIT –VII A.C. Bridges

Measurement of inductance, Quality Factor - Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge. Measurement of capacitance and loss angle - Desauty bridge. Wien's bridge – Schering Bridge.

UNIT – V III Magnetic Measurements:

Ballistic galvanometer – equation of motion – flux meter – constructional details, comparison with ballistic galvanometer.

TEXT BOOK:

1. Electrical Measurements and measuring Instruments – by E.W. Golding and F.C. Widdis, fifth Edition, Wheeler Publishing.
2. Electrical & Electronic Measurement & Instruments by A.K.Sawhney Dhanpat Rai & Co. Publications.

REFERENCE BOOKS:

1. Electrical Measurements – by Buckingham and Price, Prentice – Hall
2. Electrical Measurements by Harris.
3. Electrical Measurements: Fundamentals, Concepts, Applications – by Reissland, M.U, New Age International (P) Limited, Publishers.

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4 -/- 4

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 & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems.

Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT-II Performance of Short and Medium Length Transmission Lines

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

UNIT-III Performance of Long Transmission Lines

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

UNIT – IV Power System Transients

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

UNIT-V Various Factors Governing the Performance of Transmission lines

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

UNIT-VI Overhead Transmission Line Insulators

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

UNIT-VII Sag and Tension Calculations

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

UNIT-VIII Underground Cables

Types of Cables, Construction, Types of Insulating materials, Calculations of Insulation resistance and stress in insulation, Numerical Problems. Capacitance of Single and 3-Core belted cables, Numerical Problems. Grading of Cables - Capacitance grading, Numerical Problems, Description of Inter-sheath grading.

TEXT BOOKS:

1. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar, A.Chakrabarthy, Dhanpat Rai & Co Pvt. Ltd-6th edition-2003.
2. Electrical power systems - by C.L.Wadhwa, New Age International (P) Limited, Publishers,1998.

REFERENCE BOOKS:

1. Power system Analysis-by John J Grainger William D Stevenson TMC Companies, 4th edition,1982.
2. Power System Analysis and Design by B.R.Gupta, Wheeler Publishing-3rd edition,1998.
3. Power System Analysis by Hadi Saadat – TMH Edition-2004.
4. Modern Power System Analysis by I.J.Nagaraj and D.P.Kothari, Tata McGraw Hill, 2nd Edition-2001.

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III Year B.Tech EEE I-Sem

L T/P/D C
3 -/1/- 3

CONTROL SYSTEMS

UNIT – I INTRODUCTION

Concepts of Control Systems- Transfer function, Basics of matrices, Differential Equations, Integral Equations, Open Loop and closed loop control systems and their differences- With examples of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical modelling of Translational and Rotational mechanical systems.

UNIT II TRANSFER FUNCTION REPRESENTATION

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

UNIT-III TIME RESPONSE ANALYSIS

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

UNIT – IV STABILITY ANALYSIS IN S-DOMAIN

The concept of stability – Routh's & Hurwitz 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 – V FREQUENCY RESPONSE ANALYSIS

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

UNIT – VI STABILITY ANALYSIS IN FREQUENCY DOMAIN

Polar Plots-Nyquist Plots-Stability Analysis. Constant M and N circles.

UNIT – VII CLASSICAL CONTROL DESIGN TECHNIQUES

Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers (Conventional and Discrete).

UNIT – VIII STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization-Solving the Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability (for state and output).

TEXT BOOKS:

1. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and son's.,
2. Automatic control systems 7th edition – by B.C.Kuo 2009-PHI/John Wiley 8th ed.
3. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
4. Control systems principles and Design – by I.M.Gopal , TMH 3rd edition , 2008.

REFERENCE BOOKS:

1. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.
2. Control systems by Anand Kumar, PHI 2008.
3. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
4. Control Systems Engg. by NISE 5th Edition – John wiley-2000.
5. “Modelling & Control Of Dynamic Systems” by Narciso F. Macia George J. Thaler, Thomson Publishers.

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MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE I-Sem

L T/P/D C
4 -/1/- 4

POWER ELECTRONICS

UNIT – I POWER SEMI CONDUCTOR DEVICES

Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points (data sheets , manufacturers).

UNIT – II DEVICES AND COMMUTATION CIRCUITS

Two transistor analogy – SCR - UJT firing circuit — Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – III SINGLE PHASE HALF CONTROLLED CONVERTERS

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

UNIT – IV SINGLE PHASE FULLY CONTROLLED CONVERTERS

Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average and rms values of load voltage and current – Line commutated inverters -Active and Reactive power inputs to the converters without and with Freewheeling Diode, Effect of source inductance – Derivation of load voltage and current – Numerical problems.

UNIT – V THREE PHASE LINE COMMUTATED CONVERTERS

Three phase converters – Three pulse and six pulse converters – Mid point and bridge connections -average and rms load voltage With R and RL loads – Effect of Source inductance–Dual converters (both single phase and three phase) - Waveforms –Numerical Problems.

UNIT – VI AC VOLTAGE CONTROLLERS & CYCLO CONVERTERS

AC voltage controllers – Single phase two SCR's in anti parallel – With R and RL loads – modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor wave forms – Firing circuits -Numerical problems -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 only) – Waveforms

UNIT – VII CHOPPERS

Choppers – Time ratio control and Current limit control strategies – Step down choppers Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression-Morgan's chopper – Jones chopper and Oscillation chopper (Principle of operation only) Waveforms — AC Chopper – Problems.

UNIT – VIII INVERTERS

Single phase inverters – Classification-Basic series inverter and basic parallel inverters, – single-phase half and full-bridge inverters with R and R-L Loads – Waveforms.

TEXT BOOKS :

1. Power Electronics – by M. D. Singh & K. B. Kanchandhani, Tata Mc Graw – Hill Publishing company, 1998.
2. Power Electronics : Circuits, Devices and Applications – by M. H. Rashid, Prentice Hall of India, 2nd edition, 1998

REFERENCE BOOKS :

1. Power Electronics – by Vedam Subramanyam, New Age International (P) Limited, Publishers -1997.
2. Power Electronics - by V.R.Murthy , 1st edition -2005, OXFORD University Press
3. Power Electronics-by P.C.Sen,Tata Mc Graw-Hill Publishing-1987.
4. Thyristorised Power Controllers – by G. K. Dubey, S. R. Doradra, A. Joshi and R. M. K. Sinha, New Age International (P) Limited Publishers, 1996.

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MALLA REDDY ENGINEERING COLLEGE
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ELECTRICAL MACHINES - III

UNIT – I Construction and Principle of operation

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.

UNIT-II Synchronous Generator Characteristics

Harmonics in generated e.m.f. – suppression of harmonics – armature reaction - leakage reactance – synchronous reactance and impedance – experimental determination - phasor diagram – load characteristics.

UNIT – III Regulation of Synchronous Generator

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 – IV Parallel Operation of Synchronous Generator

Synchronizing alternators with infinite bus bars – synchronizing power torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input. Analysis of short circuit current wave form – determination of sub-transient, transient and steady state reactances.

UNIT – V Synchronous Motors – Principle of Operation

Theory of operation – phasor diagram – Variation of current and power factor with excitation – synchronous condenser – Mathematical analysis for power developed.

UNIT-VI Power Diagrams

Introduction and Applications of power diagrams, Excitation and power diagrams – hunting and its suppression – Methods of starting – synchronous induction motor.

UNIT – VII Single Phase Motors

Single phase Motors: Single phase induction motor – Constructional features-Double revolving field theory – Elementary idea of cross-field theory – split-phase motors – shaded pole motor, capacitor start & run motors.

UNIT – VIII Special Motors

Principle & performance of A.C. Series motor-Universal motor – Principle of permanent magnet and reluctance motors.

TEXT BOOKS

1. Electric Machines – by I.J.Nagrath & 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 Pitman & Sons-3rd edition-1983.
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-1999.
4. Electromechanics-III (Synchronous and single phase machines), S.Kamakashiah, Right Publishers-3rd edition-2008.

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III Year B.Tech EEE I-Sem

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ELECTRICAL MACHINES LAB – II

The following experiments are to be compulsorily conducted:

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner's test on a pair of single phase transformers
3. Scott connection of transformers
4. No-load & Blocked rotor tests on three phase Induction motor
5. Regulation of a three –phase alternator by synchronous impedance & m.m.f. methods
6. V and Inverted V curves of a three-phase synchronous motor.
7. Equivalent Circuit of a single phase induction motor
8. Determination of X_d and X_q of a salient pole synchronous machine

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

1. Parallel operation of Single phase Transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase Induction Motor
4. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
5. Efficiency of a three-phase alternator
6. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
7. Measurement of sequence impedance of a three-phase alternator.
8. Performance characteristics of a Schrage motor

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CONTROL SYSTEMS AND SIMULATION LAB

Any Eight of the following experiments are to be conducted:

1. Time response of Second order system
2. Characteristics of Synchros
3. Programmable logic controller – Study and verification of truth tables of logic gates, simple Boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. Lag and lead compensation – Magnitude and phase plot
8. Transfer function of DC generator
9. Temperature controller using PID(open loop & closed loop)
10. Characteristics of magnetic amplifiers(series, parallel & separately-excited)
11. Characteristics of AC servo motor

Any two simulation experiments are to be conducted:-

1. PSPICE simulation of Op-Amp based Integrator and Differentiator circuits.
2. Linear system analysis (Time domain analysis, Error analysis) using MATLAB.
3. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant system using MATLAB
4. State space model for classical transfer function using MATLAB – Verification.

REFERENCE BOOKS:

1. Simulation of Electrical and electronics 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 Books user's manual and – Mathworks, USA.

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MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

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MANAGEMENT SCIENCE

Unit I: Introduction to Management: Concepts of Management and organization- Nature and Importance of Management, Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

Unit II: Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, 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, lean and flat organization structure) and their merits, demerits and suitability.

Unit III: Operations Management: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement-Statistical Quality Control: \bar{X} chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling, Deming's contribution to quality.

Unit IV: A) Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records - Supply Chain Management

B) Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle., Channels of distribution.

Unit V: Human Resources Management (HRM): Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs. PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating.

Unit VI: Project Management (PERT/CPM): Network Analysis, Programme Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing. (simple problems)

Unit VII: Strategic Management: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives.

Unit VIII: Contemporary Management Practices: Basic concepts of Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Value Chain Analysis, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

Text Book:

1. Aryasri: Management Science, TMH, New Delhi.

Reference Books:

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2007
2. Koontz & Wehrich: *Essentials of Management*, 6/e, TMH, 2007
3. Thomas N.Duening & John M.Ivancevich *Management—Principles and Guidelines*, Biztantra,2007.
4. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2007.
5. Memoria & S.V.Ganker, *Personnel Management*, Himalaya, 25/e, 2007
6. Schermerhorn: *Management*, Wiley, 2007.
7. Parnell: Strategic Management, Biztantra,2007.
8. L.S.Srinath: PERT/CPM,Affiliated East-West Press, 2007.

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Code: 20216

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
4 -/1/- 4

POWER SEMICONDUCTOR DRIVES

UNIT I: ELECTRIC DRIVES

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

UNIT –II: Control of DC motors by Single phase Converters

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

UNIT-III: Control of DC motors by three phase Converters

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

UNIT – IV: Four Quadrant operations of DC Drives

Introduction to Four quadrant operation – Motoring operations, Electric Braking – Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by dual converters.

UNIT-V: Control of DC motors by Choppers

Single quadrant, Two –quadrant and four quadrant chopper fed dc separately excited and series excited motors – Continuous current operation – Output voltage and current wave forms – Speed torque expressions – speed torque characteristics – Problems on Chopper fed d.c Motors

UNIT-VI: 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- control of induction motor by Voltage source inverter and current source inverter - cyclo converters- PWM control – Comparison of VSI and CSI operations – Speed torque characteristics – numerical problems on induction motor drives

UNIT –VII: Control of Induction motor of Rotor side

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

UNIT – VIII: Control of Synchronous Motors

Separate control & self control of synchronous motors – Operation of self controlled synchronous motors by VSI.

TEXT BOOKS:

1. Fundamentals of Electric Drives – by G K Dubey Narosa Publications-5th edition-reprint,2005.
2. Power Electronic Circuits, Devices and applications by M.H.Rashid, PHI-2nd edition-reprint,2004.

REFERENCE BOOKS:

1. Power Electronics – MD Singh and K B Khanchandani, Tata – McGraw-Hill Publishing company,1998-12th edition-reprint 2004.
2. Modern Power Electronics and AC Drives by B.K.Bose, PHI-2002.
3. Thyristor Control of Electric drives – Vedam Subramanyam Tata McGraw Hill Publilcations-1988,1989, reprint 2001.
4. A First course on Electrical Drives – S K Pillai New Age International(P) Ltd. 2nd Editon-9th edition, reprint 2009.

2012-16

Code: 20217

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
4 -/-/ 4

COMPUTER METHODS IN POWER SYSTEMS

UNIT -I Power System Network Matrices-1

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

UNIT -II Power System Network Matrices-2

Formation of Z_{bus} : Partial network, Algorithm for the Modification of Z_{bus} Matrix for addition element for the following cases: Addition of element from a new bus to reference, Addition of element from a new bus to an old bus, Addition of element between an old bus to reference and Addition of element between two old busses (Derivations and Numerical Problems).- Modification of Z_{bus} for the changes in network (Problems)

UNIT -III Power flow Studies-1

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

UNIT – IV Power flow Studies-2

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

UNIT – V Short Circuit Analysis-1

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

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

UNIT –VI Short Circuit Analysis-2

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

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

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

UNIT –VII Power System Steady State Stability Analysis

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

UNIT –VIII Power System Transient State Stability Analysis

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

TEXT BOOKS:

1. Computer Techniques in Power System Analysis by M.A.Pai, TMH Publications.
2. Modern Power system Analysis – by I.J.Nagrath & D.P.Kothari: Tata McGraw-Hill Publishing company, 2nd edition, 4th edition-reprint 2005.
3. Electrical Power Systems –by C.L. Wadhva

REFERENCE BOOKS:

1. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill-2nd edition, reprint 2004.
2. Power System Analysis – by A.R.Bergen, Prentice Hall, Inc-3rd edition- reprint 2004.
3. Power System Analysis by Hadi Saadat – TMH Edition-5th edition-reprint 2004.
4. Power System Analysis by B.R.Gupta, Wheeler Publications-reprint 2004.
5. Computer methods in power systems by William stagg.

2012-16

Code: 20419

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
4 -/1/- 4

MICROPROCESSORS AND MICROCONTROLLERS

Objective :

The objective of the Microprocessor and Microcontrollers is to do the students familiarize the architecture of 8086 processor, assembling language programming and interfacing with various modules. The student can also understand of 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers. Student able to do any type of industrial and real time applications by knowing the concepts of Microprocessor and Microcontrollers.

UNIT-I 8086 ARCHITECTURE:

Functional Diagram, Register Organization, Addressing modes, Instructions, Functional schematic, Minimum and Maximum mode operations of 8086, 8086 Control signal interfacing, Timing Diagrams.

UNIT-II ASSEMBLY LANGUAGE PROGRAMMING OF 8086

Assembly Directives, Macro's, Simple Programs using Assembler, Implimentation of FOR Loop, WHILE, REPEAT and IF-THEN-ELSE Features.

UNIT-III I/O INTERFACE

8255 PPI, Various modes of operations and interface of I/O devices to 8086, A/D, D/A Converter Interfacing.

UNIT-IV INTERFACING WITH ADVANCED DEVICES.

8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control).

UNIT-V COMMUNICATION INTERFACE

Serial Communication Standards, USART Interfacing RS-232, IEEE-488, 20mA Current Loop, Prototyping and Trouble shooting, Software Debugging tools, MDS.

UNIT-VI INTRODUCTION TO MICRO CONTROLLERS

Overview of 8051 Micro Controller, Architecture, I/O ports and Memory Organization, Addressing modes and Instruction set of 8051, Simple Programs using Stack Pointer, Assembly language programming.

UNIT-VII 8051 INTERRUPTS COMMUNICATION

Interrupts, Timer/Counter and Serial Communication, Programming Timer Interrupts, Programming External H/W interrupts, Programming the serial communication interrupts, Interrupt Priority in the 8051, Programming 8051 Timers, Counters and Programming.

UNIT- VIII INTERFACING AND INDUSTRIAL APPLICATIONS

Applications of Micro Controllers, Interfacing 8051 to LED's, Push button, Relay's and Latch Connections, Keyboard Interfacing, Interfacing Seven Segment Display, ADC and DAC Interfacing.

TEXT BOOKS:

1. Kenneth J Ayala, “ The 8051 Micro Controller Architecture, Programming and Applications”, Thomson Publishers, 2nd Edition.
2. D.V.Hall, “Micro Processor and Interfacing “, Tata McGraw-Hill.

REFERENCE BOOKS:

1. Ajay V. Deshmukh, “Microcontrollers – theory applications”, Tata McGraw-Hill Companies – 2005.
2. Ray and BulChandi, “ Advanced Micro Processors”, Tata McGraw-Hill.
3. Kenneth J Ayala, “ The 8086 Micro Processors Architecture, Programming and Applications”, Thomson Publishers, 2005.
4. Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design, 2nd ed., Liu & Gibson

2012-16

Code: 202A1

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE)

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 tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT II: SOLAR ENERGY COLLECTION:

Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT III: SOLAR ENERGY STORAGE AND APPLICATIONS:

Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT IV: WIND ENERGY:

Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria

UNIT V: BIO-MASS:

Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking.

UNIT VI: GEOTHERMAL ENERGY:

Resources, types of wells, methods of harnessing the energy, potential in India.

UNIT VII: OCEAN ENERGY:

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

UNIT VIII: DIRECT ENERGY CONVERSION:

Need for DEC, Carnot cycle, limitations, principles of DEC.

TEXT BOOKS:

1. Renewable Energy Resources by Twidell & Wier, CRC Press(Taylor & Francis)
2. Renewable energy sources and emerging technologies by D.P.Kothari,K.C.Singhal, P.H.I.

REFERENCE BOOKS:

1. Renewable energy resources/ Tiwari and Ghosal/ Narosa.
2. Renewable Energy Technologies /Ramesh & Kumar /Narosa
3. Non-Conventional Energy Systems / K Mittal /Wheeler
4. Non-Conventional Energy Sources /G.D. Rai, Khanna Publishers-5th edition 2012.

2012-16

Code: 20B04

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE)

UNIT-I

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

UNIT-II

Trade Marks: Purpose and function of trademarks, acquisition of trade mark rights, protectable matter, selecting and evaluating trade mark, trade mark registration processes.

UNIT-III

Law of copy rights: Fundamental of copy right law, originality of material, rights of reproduction, rights to perform the work publicly, copy right ownership issues, copy right registration, notice of copy right, international copy right law.

UNIT-IV

Law of patents: Foundation of patent law, patent searching process, ownership rights and transfer.

UNIT-V

Trade Secrets: Trade secrete law, determination of trade secret status, liability for misappropriations of trade secrets, protection for submission, trade secrete litigation.

UNIT-VI

Unfair competition: Misappropriation right of publicity, false advertising.

UNIT-VII

New development of intellectual property: new development in trade mark law: copy right law, patent law, and intellectual property audits.

UNIT-VIII

International overview on intellectual property, international-trade mark law, copy right law, international patent law, and international development in trade secrets law.

REFERENCE & TEXT BOOKS:

1. Intellectual property right, Deborah, E.Bouchoux, cengage learing.
2. Intellectual property right – nleashmy the knowledge economy, prabuddha ganguli, tate Mc Graw Hill Publishing company Ltd.

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MALLA REDDY ENGINEERING COLLEGE
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Code: 202A2

III Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

**NANO TECHNOLOGY
(OPEN ELECTIVE)**

UNIT-I: Introduction to nanotechnology:

Importance of nanoscale, Nanostructure types, electronic, magnetic, optical properties of Nanomaterials, top-down and bottom-up approach to nanostructures.

UNIT-II: Quantum Mechanical phenomenon in nanostructures:

Quantum confinement of electrons in semiconductor nano structures, one dimensional confinement (Quantum wires), two dimensional confinements (Quantum wells), three dimensional confinements (Quantum dots).

UNIT-III: Carbon Nano Structures:

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

UNIT-IV: Fabrication of Nanomaterials:

Physical Methods: Inert gas condensation, Arc discharge, RF plasma, Plasma arc technique, Ion sputtering, Laser ablation, Laser prolysis, Molecular beam epitaxy, chemical vapour deposition method.

UNIT-V: Nano scale characterization techniques:

Scanning probe techniques (AFM, MFM, STM, SEM, TEM), XRD.

UNIT-VI: Nanodevices and Nanomedicine:

Lab on chip for bioanalysis, core/Shell Nanoparticles in drug delivery system I (site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

UNIT-VII: Nano and molecular electronics:

Resonant-Tunneling structures, single electron tunneling, single Electron transistors, coulomb blockade, giant magneto resistance, tunneling magneto resistance.

UNIT-VIII: Nanolithography and Nanomanipulation:

e-beam lithography and SEM based nanolithography and nanomanipulation, Ion beam lithography, oxidation and metallization. Mask and its application, Deep UV lithography, X-ray based lithography.

TEXT BOOKS:

1. Charles, p.ode, Introduction to nanotechnology, Springer publications.
2. Spring Handbook of Nanotechnology – Bharat Bhusan.
3. Phani kumar, principles of nanotechnology, scitech publications.

REFERENCES BOOKS:

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

2012-16

Code: 20540

MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

OPERATING SYSTEMS
(OPEN ELECTIVE)

UNIT I:

Computer System and Operating System Overview: Overview of computer operating systems operating systems functions protection and security distributed systems special purpose systems operating systems structures and systems calls operating systems generation

UNIT-II:

Process Management – Process concepts threads, scheduling-criteria algorithms, their evaluation, Thread scheduling, case studies UNIX, Linux, Windows

UNIT III:

Concurrency : Process synchronization, the critical- section problem, Peterson’s Solution, ynchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples, atomic transactions. Case studies UNIX, Linux, Windows

UNIT IV:

Memory Management : Swapping, contiguous memory allocation, paging, structure of the page table ,segmentation, virtual memory, demand paging, page-Replacement, algorithms, case studies UNIX, Linux, Windows

UNIT V:

Principles of deadlock – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock, I/O systems, Hardware, application interface, kernel I/O subsystem, Transforming I/O requests Hardware operation, STREAMS, performance.

UNIT VI:

File system Interface- the concept of a file, Access Methods, Directory structure, File system mounting, and file sharing, protection. File System implementation- File system structure, file system implementation, directory implementation, directory implementation, allocation methods, free-space management, efficiency and performance, case studies. UNIX, Linux, Windows

UNIT VII :

Mass-storage structure overview of Mass-storage structure, Disk structure, disk attachment disk scheduling, swap-space management, RAID structure, stable-storage implementation, Tertiary storage structure.

UNIT VIII:

Protection : Protection, Goals of Protection, Principles of Protection, Domain of protection Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection, Security- The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer –security classifications, case studies UNIX, Linux, Windows

TEXT BOOKS :

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley -8th edition-reprint-2010.
2. Operating systems- A Concept based Approach-D.M.Dhamdhare, 2nd Edition, TMH-1st reprint -2006.

REFERENCES :

1. Operating Systems' – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI
2. Operating System A Design Approach-Crowley, TMH.
3. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

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MALLA REDDY ENGINEERING COLLEGE
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Code: 20406

III Year B.Tech EEE II-Sem

L T/P/D C
3 -/1/- 3

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.

UNIT II

BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS: Fundamental postulates of Boolean Algebra - Basic theorems and properties - switching functions–Canonical and Standard forms-Algebraic simplification digital logic gates, properties of XOR gates –universal gates-Multilevel NAND/NOR realizations.

UNIT III

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 IV

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.

UNIT V

PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC: Basic PLD's-ROM, PROM, PLA, PLD Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.

UNIT VI

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 VII

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.

UNIT VIII

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

TEXTBOOKS :

1. Switching & Finite Automata theory – Zvi Kohavi, TMH, 2nd Edition 48th reprint.
2. Digital Design – Morris Mano, PHI, 3rd Edition, 2006.

REFERENCES :

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

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MALLA REDDY ENGINEERING COLLEGE
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III Year B.Tech EEE II-Sem

L T/P/D C
- -/3/- 2

ELECTRICAL MEASUREMENTS LAB

The following experiments are to be conducted as compulsory experiments:

1. Calibration and Testing of single phase energy Meter
2. Calibration of dynamometer power factor meter
3. Crompton D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter
4. Kelvin's double Bridge – Measurement of resistance – Determination of Tolerance.
5. Dielectric oil testing using H.T testing Kit
6. Schering bridge & Anderson bridge.
7. Measurement of 3 phase reactive power with single-phase wattmeter.
8. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.

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

9. Calibration LPF wattmeter – by Phantom testing
10. Measurement of 3 phase power with single watt meter and 2 No's of C.T.
11. C.T. testing using mutual Inductor – Measurement of % ratio error and phase angle of given C.T. by Null method.
12. P.T. testing by comparison – V.G. as Null detector – Measurement of % ratio error and phase angle of the given P.T.
13. LVDT and capacitance pickup – characteristics and Calibration
14. Resistance strain gauge – strain measurements and Calibration
15. Transformer turns ratio measurement using a.c. bridge.
16. Measurement of 1% ratio error and phase angle of given C.T. by comparison.

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MALLA REDDY ENGINEERING COLLEGE
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Code: 20219

III Year B.Tech EEE II-Sem

L T/P/D C
- -/3/- 2

POWER ELECTRONICS AND SIMULATION LAB

LIST OF EXPERIMENTS:

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate firing circuits 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. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E)
6. DC Jones chopper with R and RL Loads
7. Single Phase Parallel, inverter with R and RL loads
8. Single Phase Cycloconverter with R and RL loads
9. Single Phase Half controlled converter with R load
10. Three Phase half controlled bridge converter with R-load
11. Single Phase series inverter with R and RL loads
12. Single Phase Bridge converter with R and RL loads
13. Single Phase dual converter with RL loads

ANY TWO OF SIMULATION EXPERIMENTS WITH PSPICE/PSIM

1. PSPICE simulation of single-phase full converter using RLE loads and single-phase AC voltage controller using RLE
2. loads
3. PSPICE simulation of resonant pulse commutation circuit and Buck chopper.
4. PSPICE simulation of single phase Inverter with PWM control.

Reference Books:

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 Books user's manual and- Mathworks, USA.
5. Spice for power electronics and electric power by Rashid, CRC Press

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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SWITCH GEAR AND PROTECTION

Objective :

This course introduces all varieties of Circuit Breakers and Relays for protection of Generators, Transformers and feeder bus bars from over voltages and other hazards. It emphasis on Neutral grounding for overall protection.

UNIT – I Circuit Breakers-1

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

UNIT –II Circuit Breakers-2

Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

UNIT – III 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 verses Electromagnetic Relays.

UNIT – IV Generator Protection

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

UNIT –V Transformer Protection

Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholtz relay Protection.

UNIT –VI Feeder and Bus-Bar Protection

Protection of Lines: Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay. Protection of Bus bars – Differential protection.

UNIT – VII 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 – VIII Protection against over voltages

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

TEXT BOOKS:

1. Switchgear and Protection – by Sunil S Rao, Khanna Publlishers
2. Power System Protection and Switchgear by Badari Ram , D.N Viswakarma, TMH Publications

REFERENCE BOOKS:

1. Fundamentals of Power System Protection by Paithankar and S.R.Bhide.,PHI, 2003.
2. Art & Science of Protective Relaying – by C R Mason, Wiley Eastern Ltd.
3. Electrical Power Systems – by C.L.Wadhwa, New Age international (P) Limited, Publishers, 3nd editon
4. A Text book on Power System Engineering by B.L.Soni, Gupta, Bhatnagar, Chakrabarthy, Dhanpat Rai & Co.

**MALLA REDDY ENGINEERING COLLEGE
(Autonomous)**

IV Year B.Tech EEE I-Sem

L	T/P/D	C
3	1/-/-	3

UTILIZATION OF ELECTRICAL ENERGY

Objective :

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

UNIT – I ELECTRIC DRIVES

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

UNIT – II ELECTRIC HEATING

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

UNIT – III ELECTRIC WELDING

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

UNIT – IV ILLUMINATION FUNDAMENTALS

Introduction, terms used in illumination, laws of illumination, polar curves, photometry, integrating sphere, sources of light.

UNIT – V VARIOUS ILLUMINATION METHODS

Discharge lamps, MV and SV lamps – comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and flood lighting.

UNIT – VI ELECTRIC TRACTION – I

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

UNIT – VII ELECTRIC TRACTION – II

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

UNIT – VIII ELECTRIC TRACTION-III

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

TEXT BOOK:

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

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.

2012-16

Code: 20222

**MALLA REDDY ENGINEERING COLLEGE
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IV Year B.Tech EEE I-Sem

L	T/P/D	C
3	1/-/-	3

INSTRUMENTATION

Objective :

Instrumentation is essential in monitoring and analysis of any Physical system and its control. This course deals with different types of transducers, digital voltmeters, oscilloscopes and measurement of non electrical quantities.

UNIT-I Characteristics of Signals

Measuring Systems, Performance Characteristics, - Static characteristics, Dynamic Characteristics; Errors in Measurement – Gross Errors, Systematic Errors, Statistical Analysis of Random Errors.

UNIT-II Signals and their representation

Signal and their representation: Standard Test, periodic, aperiodic, modulated signal, sampled data, pulse modulation and pulse code modulation

UNIT-III Oscilloscope

Cathode ray oscilloscope-Cathode ray tube-time base generator-horizontal and vertical amplifiers-CRO probes-applications of CRO-Measurement of phase and frequency-lissajous patterns-Sampling oscilloscope-analog and digital type

UNIT-IV Digital Voltmeters

Digital voltmeters- Successive approximation, ramp, dual-Slope integration continuous balance type-Micro processor based ramp type DVM digital frequency meter-digital phase angle meter-

UNIT-V Signal Analyzers

Wave Analysers- Frequency selective analyzers, Heterodyne, Application of Wave analyzers- Harmonic Analyzers, Total Harmonic distortion, spectrum analyzers, Basic spectrum analyzers, spectral displays, vector impedance meter, Q meter. Peak reading and RMS voltmeters

UNIT-VI Transducers

Definition of transducers, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers; Principle operation of resistor, inductor, LVDT and capacitor transducers; LVDT Applications, Strain gauge and its principle of operation, gauge factor, Thermistors, Thermocouples, Synchros, Piezo electric transducers, photovoltaic, photo conductive cells, photo diodes.

UNIT-VII Measurement of Non-Electrical Quantities-I

Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Angular Velocity, Acceleration, Force, Torque.

UNIT-VIII Measurement of Non-Electrical Quantities-II

Measurement of Temperature, Pressure, Vacuum, Flow, Liquid level.

TEXT BOOKS:

1. Transducers and Instrumentation by D.V.S Murthy, Prentice Hall of India
2. A course in Electrical and Electronic Measurements and Instrumentation, A.K.Sawhney,Dhanpatrai & Co.

REFERENCE BOOKS:

1. Measurements Systems, Applications and Design – by D O Doebelin
2. Principles of Measurement and Instrumentation – by A.S Morris, Pearson /Prentice Hall of India
3. Electronic Instrumentation-by H.S.Kalsi Tata MCGraw-Hill Edition, 1995.
4. Modern Electronic Instrumentation and Measurement techniques – by A.D Helfrick and W.D.Cooper, Pearson/Prentice Hall of India.

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CODE: 20223

MALLA REDDY ENGINEERING COLLEGE
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IV Year B.Tech EEE I-Sem

L	T/P/D	C
4	-/-	4

POWER SYSTEM OPERATION AND CONTROL

Objective :

This subject deals with Economic operation of Power Systems, Hydrothermal schedulings and modeling of turbines, generators and automatic controllers. It emphasizes on single area and two area load frequency control and reactive power control.

UNIT - I Economic Operation of Power Systems-1

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 - II Economic Operation of Power Systems-2

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

UNIT - III Hydrothermal Scheduling

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

UNIT -IV Modeling of Turbine, Generator and Automatic Controllers

Modeling of Turbine: First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models. Modeling of Governor: Mathematical Modeling of Speed Governing System – Derivation of small signal transfer function. Modeling of Excitation System: Fundamental Characteristics of an Excitation system, Ttransfer function, Block Diagram Representation of IEEE Type-1 Model

UNIT - V 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.

UNIT - VI Two-Area Load Frequency Control

Load frequency control of 2-area system – uncontrolled case and controlled case, tie-line bias control

UNIT-VII Load Frequency Controllers

Proportional plus Integral control of single area and its block diagram representation, steady state response – Load Frequency Control and Economic dispatch control.

UNIT - VIII 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 (qualitative treatment).

TEXT BOOKS:

1. Electrical Power Systems by C.L.Wadhwa, Newage International-3rd Edition
2. Modern Power System Analysis – by I.J.Nagrath & D.P.Kothari Tata M Graw – Hill Publishing Company Ltd, 2nd edition.

REFERENCE BOOKS:

1. Power System Analysis and Design by J.Duncan Glover and M.S.Sarma., THOMPSON, 3rd Edition.
2. Electric Energy systems Theory – by O.I.Elgerd, Tata Mc Graw-hill Publishing Company Ltd., Second edition.
3. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill.
4. Power System Analysis by Hadi Saadat – TMH Edition.

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IV Year B.Tech EEE I-Sem

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**HIGH VOLTAGE ENGINEERING
(Elective-I)**

Objective ;

This subject deals with the detailed analysis of Breakdown occur in gaseous, liquids and solid dielectrics. Information about generation and measurement of High voltage and current. In addition the High voltage testing methods are also discussed.

UNIT I INTRODUCTION TO HIGH VOLTAGE TECHNOLOGY AND APPLICATIONS

Electric Field Stresses, Gas / Vacuum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, rotating machines, circuit breakers, cable power capacitors and bushings.

UNIT II BREAK DOWN IN GASEOUS AND LIQUID DIELECTRICS

Gases as insulating media, collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, pure and commercial liquids, breakdown in pure and commercial liquids.

UNIT III BREAK DOWN IN SOLID DIELECTRICS

Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, solid dielectrics used in practice.

UNIT IV 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 V MEASUREMENT OF HIGH VOLTAGES AND CURRENTS

Measurement of High Direct Current voltages, Measurement of High Voltages alternating and impulse, Measurement of High Currents-direct, alternating and Impulse, Oscilloscope for impulse voltage and current measurements.

UNIT VI OVER VOLTAGE PHENOMENON AND INSULATION CO-ORDINATION

Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

UNIT VII NON-DSTRUCTIVE TESTING OF MATERIAL AND ELECTRICAL APPARATUS

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

UNIT VIII HIGH VOLTAGE TESTING OF ELECTRICAL APPARATUS

Testing of Insulators and bushings, Testing of Isolators and circuit breakers, Testing of cables, Testing of Transformers, Testing of Surge Arresters, 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.

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VLSI DESIGN
(Elective-I)

Objective: This subject deals with introduction of IC technology, basic electrical properties and design processes, gate level design, CMOS testing and etc are also discussed.

UNIT I

INTRODUCTION : Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT II

BASIC ELECTRICAL PROPERTIES : Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit \square o; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT III

VLSI CIRCUIT DESIGN PROCESSES: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 microm CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

UNIT IV

GATE LEVEL DESIGN : Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT V

DATA PATH SUB SYSTEMS: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.

UNIT VI

ARRAY SUB SYSTEMS: SRAM, DRAM, ROM Serial access memories, content addressable memory.

UNIT VII

SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN: VHDL SYNTHESIS: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach parameters influencing low power design.

UNIT VIII

CMOS TESTING : CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXTBOOKS :

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas and A. Pucknell, PHI, 2005 Edition.
2. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, 1999.

REFERENCES :

1. Chip Design for Submicron VLSI: CMOS Layout & Simulation, - John P. Uyemura, Thomson Learning.
2. Introduction to VLSI Circuits and Systems - John .P. Uyemura, JohnWiley, 2003.
3. Digital Integrated Circuits - John M. Rabaey, PHI, EEE, 1997.
4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
5. VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.

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DIGITAL CONTROL SYSTEMS
(Elective-I)

Objective: To impart basic knowledge of A/D and D/A conversion, understand the basics of Z- Transform, the stability analysis of digital control system and digital process control design.

UNIT - I SAMPLING AND RECONSTRUCTION

Introduction, Examples of Data control systems – Digital to Analog conversion and Analog to Digital conversion, sample

UNIT-II THE Z – TRANSFORMS

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

UNIT-III Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM

Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT – IV 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

UNIT – V 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 – VI STABILITY ANALYSIS

Mapping between the S-Plane and the Z-Plane – Primary strips and Complementary Strips – Constant frequency loci, Constant damping ratio loci, Stability Analysis of closed loop systems in the Z-Plane. Jury stability test – Stability Analysis by use of the Bilinear Transformation and Routh Stability criterion.

UNIT – VII DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS

Transient and steady – State response Analysis – 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.

UNIT – VIII 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.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.
2. Digital Control and State Variable Methods by M.Gopal, TMH

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EMBEDDED SYSTEMS
(Elective-I)

Objective: To impart basic knowledge on software developments and its applications of embedded system, process and memory organization, device networks, programming and hardware.

UNIT-I

Embedded computing: Introduction, complex systems and Microprocessor, The Embedded system Design process, Formalisms for system Design, Design Examples

UNIT-II

The 8051 Architecture: Introduction, 8051 Micro controller Hardware, Input/Output ports and circuits, External Memory, counter and Timers, serial data Input/Output, interrupts.

UNIT-III

Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.

UNIT-IV

Arithmetic Operations, decimal Arithmetic, Jump and call Instructions, Further Details on Interrupts.

UNIT-V

Applications: Interfacing with keyboards, Displays, D/A and D/A conversions, Multiple Interrupts, serial Data communication.

UNIT-VI

Introduction to Real – Time Operating system: 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.

UNIT-VII

Basic Design Using a Real – Time Operating system: Principles, Semaphores and Queues, Hard Real – Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (open source), Embedded

Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, using Laboratory Tools, An example system. Resonant-Tunneling structures, single electron tunneling, single Electron transistors, coulomb blockade, giant magneto resistance, tunneling magneto resistance.

UNIT-VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus; Internet – Enabled Systems, design Example – Elevator Controller.

TEXT BOOKS:

1. Computers as components principles of Embedded computer System design, Wayne Wolff, Elsevir.
2. The 8051f micro controller, Third edition, Kenneth J. Ayala, Thomson

REFERENCES:

1. Embedded system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukshi, TMH.
4. Embedded System design, Frank vahid, Tony Givargis, John Willey

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OPTIMIZATION TECHNIQUES
(Elective-II)

Objective: To impart knowledge on basics of classical optimization techniques, linear programming problems, non-linear programming with constrained and unconstrained problems, dynamic programming and its applications.

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.

UNIT – II 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 – III 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.

UNIT – IV 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 – V Unconstrained Nonlinear Programming:

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

UNIT – VI Unconstrained Optimization Techniques

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

UNIT – VII 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 – VIII 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 & K.D. Kumar, Springer(India), Pvt .LTd.

REFERENCE BOOKS:

- 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 – by Dr. S.D.Sharma.
3. “Operations Research : An Introduction” – by H.A. Taha, PHI Pvt. Ltd., 6th edition
4. Linear Programming – by G. Hadley

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ELECTRICAL DISTRIBUTION SYSTEMS
(Elective-II)

Objective: After completing this course the students should be able to: Ability to carry on “load Analysis”, Understanding of load forecasting using Box-Jenkins methodology, Ability to apply distribution transformers, Ability to model and understand sub-transmission and distribution lines, Ability to calculate a voltage regulation and voltage drops, Understanding of Automated Distribution Operations.

UNIT – 1 GENERAL CONCEPTS

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

UNIT – II DISTRIBUTION FEEDERS

Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage levels, feeder loading; basic design practice of the secondary distribution system.

UNIT – III SUBSTATIONS

Location of Substations: Rating of distribution substation, service area within primary feeders. Benefits derived through optimal location of substations.

UNIT – IV 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 – V PROTECTION

Objectives of distribution system protection, types of common faults and procedure for fault calculations. Protective Devices: Principle of operation of Fuses, Circuit Reclosures, line sectionalizes, and circuit breakers

UNIT – VI COORDINATION

Coordination of Protective Devices: General coordination procedure.

UNIT – VII COMPENSATION FOR POWER FACTOR IMPROVEMENT

Capacitive compensation for power-factor control. Different types of power capacitors, shunt and series capacitors, effect of shunt capacitors (Fixed and switched), Power factor correction, capacitor allocation - Economic justification - Procedure to determine the best capacitor location.

UNIT – VIII VOLTAGE CONTROL

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, Mc Graw-hill Book Company.
2. Electric Power Distribution – by A.S. Pabla, Tata Mc Graw-hill Publishing company, 4th edition, 1997.

REFERENCE BOOK:

1. Electrical Power Distribution and Automation by S.Sivanagaraju, V.Sankar, Dhanpat Rai & Co, 2006
2. Electrical Power Distribution Systems by V.Kamaraju, Right Publishers.

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PRINCIPLES OF DIGITAL SIGNAL PROCESSING
(ELECTIVE-II)

Objective: To impart basic knowledge of DSP, signal analysis, Laplace and Z-transform and its applications.

UNIT-I: Signal Analysis:

Analogy between vectors and signals, Classification of signals with examples, Classification of systems with examples.

Fourier series: Trigonometric Fourier series, Exponential Fourier series, Line spectrum, Properties of Fourier series, Dirchlet's conditions, Problems. Fourier Transform: Fourier transform and relation between Fourier series and Fourier transform(F.T), Properties of Fourier Transform, conditions for existence of F.T, Inverse Fourier Transform, Significance of energy density and power density spectrum, Evaluation of convolution Integral, Problems.

UNIT-II: Signal Transmission Through Linear System:

Linear system, Impulse response, Response of a linear system, Linear time invariant(LTI), Transfer function of a LTI system, Filter characteristics of linear system, Distortion less transmission through a system, Physical Realizability of LTI systems, Ideal LPF,HPF and BPF characteristics, Relation between rise time and band width of s system, Relation between input and output Power Spectral Densities, Sampling Theorem and signal Reconstruction, Aliasing, Problems.

UNIT-III: Laplace and Z-Transforms:

Laplace Transform (L.T): Concept of L.T, properties of Laplace Transform, Region of Convergence, Solution to differential equations, Inverse Laplace Transform, Problems.Z-Transforms (Z.T): Concept of Z.T, properties of Z-Transform, Region of convergence, Inverse Z-Transform, Solution to difference equations, Relation between F.T.L.T and Z.T, Problems.

UNIT-IV: Introduction to DSP:

Discrete Time (DT) signals and sequences, Properties of DT LTI system Linearity, Time invariance, Stability, Causality, memory less, linear constant Coefficient Difference Equations and its solution, Concept of Discrete Time Fourier Transform (DTFT), Frequency domain representation of discrete time signals and system, properties of DTFT, Problems.

UNIT-V: Discrete Fourier Representation:

Discrete Fourier series (DFS): DFS representation of periodic sequences, properties, problems.

Discrete Fourier Transform (DFT): Discrete Fourier Transform, Properties of DFT, Linear convolution of sequence using DFT, Computation of DFT, Relation between DTFT, DFS,Z.T and DFT, Problem.

UNIT-VI: Fast Fourier Transforms:

Fast Fourier transforms (FFT)-Radix-2 Decimation – in – time (DIT) and Decimation – in- frequency (DIF)FFT Algorithms, Comparison of DFT FFT, Inverse FFT and FFT for composite N, Problems.

UNIT-VII: IIR Digital Filters:

Anlog filter approximations – Butterworth and Chebyshev, Design of HR Digital filter from Analog filter – step Invariance, impulse invariance and bilinear transformation techniques, design examples, realization of IIR filters direct, canaonic, cascade and parallel forms.

UNIT-VIII: FIR digital filters:

Characteristics of FIR digital filters, frequency response, design of FIR digital filters-Fourier method, window techniques, frequency sampling technique, comparison of IIR and FIR filters, realization of FIR filters direct, canaonic, cascade and parallel forms.

TEXT BOOKS:

1. Signals, Systems and communications B.P.lathi B.S.Publications 2009.
2. Digital Time Signal Processing – A.V.Oppenheim and R.W.Schaffer, and JR Buck pearson education 2009.
3. Fundamentals of Digital Signal Processing - loney ludeman, John wiley2010.

REFERENCES BOOKS:

1. Signal & systems –A.V. Oppenheim and A S Wilsky and SH Nawab PHI 2/e 2008
2. Digital Signal Processing: S Salivahanan, A Vallava raj and C.Gnanapriya TMH, 2008
3. Digital Signal Processing, principles, algorithms and applications-John G proakis, Dimitris G. manolakis pearson education/phi 2007.
4. Digital Signal Processing –fundamentals applications Litan Elsevier 2008
5. Digital Signal Processing A practical approach, Emmanuel C.IFEACHOR and Barie Jervis 2/e 2009

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DATABASE MANAGEMENT SYSTEMS
(Elective-II)

Objective:

Learn about database design concepts, data models (Entity-Relationship and Relational Model), the database query language SQL and components of a database management system. Further topics include query processing and optimization techniques, transaction management, and storage and file structures

Syllabus:**UNIT – I:**

Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems. Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT – II:

Relational Model: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views. Relational Algebra and Calculus: Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

UNIT – III:

Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity's – AND, OR and NOTR – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL 0 Triggers and Active Data bases.

UNIT – IV:

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.

UNIT – V:

Overview of Transaction Management: ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

UNIT – VI:

Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions – Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking. Crash recovery: Introduction to ARIES – the Log – Other Recovery related Structures – the Write-Ahead Log Protocol – Check

pointing – recovering from a System Crash – Media recovery – Other approaches and Interaction with Concurrency control.

UNIT – VII:

Overview of Storage and Indexing: Data on External Storage – File Organization and Indexing – Cluster Indexes, Primary and Secondary Indexes – Index data Structures – Hash Based Indexing – Tree base Indexing – Comparison of File Organizations – Indexes and Performance Tuning.

UNIT – VIII:

Storing data: Disks and Files: - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.

Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Extendable vs. Linear hashing.

Text Books:

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, Mc.Graw hill, IV edition.

References:

1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Systems design, Implementation, and Management, Rob & Coronel 5th Edition.Thomson
3. Data base Management System, Elmasri Navrate Pearson Education
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education

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MICROPROCESSORS AND MICROCONTROLLERS LAB

The following programs are to be written for assembler and execute the same with 8086 and 8051 kits:

PART-I

1. Programs for 16 bit arithmetic operations for 8086 (using various addressing modes)
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessor kits using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.

PART-II

10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify timer/counter in 8051.
12. Program and verify interrupt handling in 8051.
13. UART operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/keyboard to 8051..
17. Data Transfer from peripheral to memory through DMA controller 8237/8257.

Note: Minimum of 12 experiments to be conducted.

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ADVANCED ENGLISH COMMUNICATIONS SKILLS LAB

1. Introduction

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

The proposed course should be an integrated theory and lab course to enable students to use 'good' English and perform the following:

- Gather ideas and information, to organise ideas relevantly and coherently.
- Engage in debates.
- Participate in group discussions.
- Face interviews.
- Write project/research reports/technical reports.
- Make oral presentations.
- Write formal letters.
- Transfer information from non-verbal to verbal texts and vice versa.
- To take part in social and professional communication.

2. Objectives:

This Lab focuses on using computer-aided multimedia instruction for language development to meet the following targets:

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

3. Syllabus:

The following course content is prescribed for the Advanced Communication Skills Lab:

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

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:

- i) P – IV Processor
 - a) Speed – 2.8 GHZ
 - b) RAM – 512 MB Minimum
 - c) Hard Disk – 80 GB
- ii) 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)**
- **The following software from ‘train2success.com’**
 - **Preparing for being Interviewed,**
 - **Positive Thinking,**
 - **Interviewing Skills,**
 - **Telephone Skills,**
 - **Time Management**
 - **Team Building,**
 - **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

6. Books Recommended:

1. **Effective Technical Communication**, M. Ashraf Rizvi, Tata Mc. Graw-Hill Publishing Company Ltd.
2. **A Course in English communication** by Madhavi Apte, Prentice-Hall of India, 2007.
3. **Communication Skills** by Leena Sen, Prentice-Hall of India, 2005.
4. **Academic Writing- A Practical guide for students** by Stephen Bailey, Rontledge Falmer, London & New York, 2004.
5. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
6. **Body Language- Your Success Mantra** by Dr. Shalini Verma, S. Chand, 2006.
7. **DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice**, New Age International (P) Ltd., Publishers, New Delhi.
8. Books on **TOEFL/GRE/GMAT/CAT** by Barron’s/cup
9. **IELTS series with CDs** by Cambridge University Press.
10. **Technical Report Writing Today** by Daniel G. Riordan & Steven E. Pauley, Biztantra Publishers, 2005.
11. **Basic Communication Skills for Technology** by Andra J. Rutherford, 2nd Edition, Pearson Education, 2007.
12. **Communication Skills for Engineers** by Sunita Mishra & C. Muralikrishna, Pearson Education, 2007.
13. **Objective English** by Edgar Thorpe & Showick Thorpe, 2nd edition, Pearson Education, 2007.
14. **Cambridge Preparation for the TOEFL Test** by Jolene Gear & Robert Gear, 4th Edition.
15. **Technical Communication** by Meenakshi Raman & Sangeeta Sharma, Oxford University Press.

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HVDC TRANSMISSION

Objective :

This subject deals with the importance of HVDC transmission, analysis of HVDC converters, Faults and protections, Harmonics and Filters. It also deals with Reactive power control and Power factor improvements of the system.

UNIT – I BASIC CONCEPTS

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

UNIT – II ANALYSIS OF HVDC CONVERTERS

Choice of Converter configuration – analysis of Graetz – characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star – star mode – their performance.

UNIT – III CONVERTER & HVDC SYSTEM CONTROL

Principal of DC Link Control – Converters Control Characteristics – Firing angle control – Current and extinction angle control – Effect of source inductance on the system; Starting and stopping of DC link; Power Control.

UNIT-IV REACTIVE POWER CONTROL IN HVDC

Reactive Power Requirements in steady state-Conventional control strategies-Alternate control strategies-sources of reactive power-AC Filters – shunt capacitors-synchronous condensers.

UNIT –V POWER FLOW ANALYSIS IN AC/DC SYSTEMS

Modeling of DC Links-DC Network-DC Converter-Controller Equations-Solution of DC load flow – P.U. System for d.c. quantities-solution of AC-DC Power flow-Simultaneous method-Sequential method.

UNIT-VI CONVERTER FAULT & PROTECTION

Converter faults – protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers –Audible noise-space charge field-corona effects on DC lines-Radio interference.

UNIT – VII HARMONICS

Generation of Harmonics –Characteristics harmonics, calculation of AC Harmonics, on- Characteristics harmonics, adverse effects of harmonics – Calculation of voltage & Current harmonics – Effect of Pulse number on harmonics

UNIT-VIII 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. EHVAC and HVDC Transmission Engineering and Practice – S.Rao.

REFERENCE BOOKS:

1. HVDC Transmission – J.Arrillaga.
2. Direct Current Transmission – by E.W.Kimbark, John Wiley & Sons.
3. Power Transmission by Direct Current – by E.Uhlmann, B.S.Publications.

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NEURAL NETWORKS AND FUZZY LOGIC
(Elective-III)

Objective :

This course introduces the basics of Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components. The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work.

Unit – I: Introduction to Neural Networks

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

Unit- II: 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–III: Single Layer Feed Forward Neural Networks

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

Unit- IV: Multilayer Feed forward Neural Networks

Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

Unit V: 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),

Unit VI:

Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem

Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network Summary and Discussion of Instance/Memory Based Learning Algorithms, Applications.

Unit – VII: Classical & Fuzzy Sets

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

UNIT VIII: Fuzzy Logic System Components

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

TEXT BOOK:

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Neural Networks using MATLAB 6.0 - S.N.Sivanandam, S.Sumathi, S.N.Deepa, TMH, 2006

REFERENCE BOOKS:

1. Neural Networks – James A Freeman and Davis Skapura, Pearson Education, 2002.
2. Neural Networks – 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.

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LINEAR SYSTEMS ANALYSIS
(Elective-III)

Objective: It imparts knowledge on state space analysis, Fourier analysis and applications of Fourier transform, Laplace transform, testing of polynomials and basics of sampling.

UNIT-I STATE VARIABLE ANALYSIS

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

UNIT-II FOURIER SERIES AND FOURIER TRANSFORM REPRESENTATION

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

UNIT-III APPLICATIONS OF FOURIER SERIES AND FOURIER TRANSFORM REPRESENTATION

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

UNIT – IV LAPLACE TRANSFORM APPLICATIONS

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

UNIT-V TESTING OF POLYNOMIALS

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

UNIT-VI NETWORK SYNTHESIS

Network synthesis: Synthesis of one port LC networks-Foster and Cauer methods-Synthesis of RL and RC one port networks-Foster and Cauer methods

UNIT-VII SAMPLING

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

UNIT-VIII Z-TRANSFORMS

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

TEXT BOOKS:

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

REFERENCE BOOKS:

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

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RELIABILITY ENGINEERING APPLICATIONS TO POWER SYSTEMS
(Elective-III)

Objective: It imparts basics of probability and statistics, reliability and network modeling and its analysis and functions, markov modeling, frequency and duration techniques, composite analysis and its applications.

UNIT – I Basics of Probability theory & Distribution

Basic probability theory – rules for combining probabilities of events – Bernoulli's trials – probabilities density and distribution functions – binomial distribution – expected value and standard deviation of binomial distribution.

UNIT – II Network Modeling and Reliability Analysis

Analysis of Series, Parallel, Series-Parallel networks – complex networks – decomposition method.

UNIT – III Reliability functions

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

UNIT – IV Markov Modelling

Markov chains – concept of stochastic transitional probability Matrix, Evaluation of limiting state Probabilities. – Markov processes one component repairable system – time dependent probability evaluation using Laplace transform approach – evaluation of limiting state probabilities using STPM – two component repairable models.

UNIT – V Frequency & Duration Techniques

Frequency and duration concept – Evaluation of frequency of encountering state, mean cycletime, for one , two component repairable models – evaluation of cumulative probability and cumulative frequency of encountering of merged states.

UNIT – VI 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 – VII Composite Systems Reliability Analysis

Decompositions method – Reliability Indices – Weather Effects on Transmission Lines.

UNIT – VIII Distribution System and Reliability Analysis

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

TEXT BOOKS:

1. Reliability Evaluation of Engg. System – R. Billinton, R.N.Allan, Plenum Press, New York, reprinted in India by B.S.Publications, 2007.
2. Reliability Evaluation of Power systems – R. Billinton, R.N.Allan, Pitman Advance Publishing Program, New York, reprinted in India by B.S.Publications, 2007.

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ELECTRICAL POWER QUALITY
(Elective-III)

Objective: It imparts knowledge on power quality, interrupts and its problems, voltage-sag characterization, mitigations and EMC standards and its industrial applications.

Unit 1: Introduction:

Introduction of the power quality abc to $\alpha\beta 0$ problem, terms used in PQ: voltage, sag, swell, surges, Harmonics, over voltages, spikes, voltage fluctuations, transients, interruption, overview of power quality phenomenon. Remedies to improve power quality, power quality monitoring.

Unit II: Interruptions

Interruptions-definition-difference between failure, outage, interruptions-causes of long interruptions origin of interruptions-limits for the interruption frequency-limits for the interruption duration-costs of interruption-overview of reliability evaluation to power quality, comparison of observations and reliability evaluation.

Unit III: Short interruptions

Short interruptions-definitions, origin of short interruptions, basic principle, fuse saving, voltage magnitude events due to re-closing, voltage during the interruption, monitoring of short interruptions, difference between medium and low voltage systems, multiple events, single phase tripping-voltage and current during fault period, voltage and current at post fault period, stochastic prediction of short interruptions.

Unit IV: Voltage sag-characterization-Single phase

Voltage sag-definition, causes of voltage sag, voltage sag magnitude, monitoring theoretical calculation of voltage sag magnitude, voltage sag calculation in non-radial systems meshed systems. Voltage sag duration.

Unit V: Voltage sag-characterization-three phase:

Three phase faults, phase angle jumps, magnitude and phase angle for three phase unbalanced sags. Load influence on voltage sags.

Unit VI: PQ consideration in industrial power systems:

Voltage sag-equipment behavior of power electronic loads, induction motors, synchronous motors, computers, consumer electronics adjustable speed AC drives and its operation. Mitigation of AC drives, adjustable speed DC drives and its operation, mitigation methods of DC drives.

Unit VII: mitigation of interruptions and voltage sags:

Overview of mitigation methods-from fault trip, reducing the number of faults, reducing the fault clearing time changing the power system, installing mitigation equipment, improving equipment immunity, different events and mitigation methods. System equipment interface-voltage source converter, series voltage controller, shunt controller, combined shunt and series controller.

Unit VIII: Power quality and EMC standards:

Introduction to standardization, IEC electromagnetic compatibility standards, European voltage characteristics standards, PO surveys.

REFERENCE BOOK:

1. "Understanding power quality problems" by math H J Bollen. IEEE press.

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ADVANCED CONTROL SYSTEMS
(Elective-IV)

Objective :

This subject deals with state space, describing function, phase plane and stability analysis including controllability and observability. It also deals with modern control and optimal control systems.

UNIT – I STATE SPACE ANALYSIS

State Space Representation, Solution of State Equation, State Transition Matrix, Canonical Forms – Controllable Canonical Form, Observable Canonical Form, Jordan Canonical Form.

UNIT – II CONTROLLABILITY AND OBSERVABILITY

Tests for controllability and observability for continuous time systems – Time varying case, minimum energy control, time invariant case, Principle of Duality, Controllability and observability form Jordan canonical form and other canonical forms.

UNIT – III DESCRIBING FUNCTION ANALYSIS

Introduction to nonlinear systems, Types of nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-IV PHASE-PLANE ANALYSIS

Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems.

UNIT-V STABILITY ANALYSIS

Stability in the sense of Lyapunov., Lyapunov's stability and Lyapunov's instability theorems. Direct method of Lyapunov for the Linear and Nonlinear continuous time autonomous systems.

UNIT – VI MODAL CONTROL

Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.

UNIT-VII CALCULUS OF VARIATIONS

Minimization of functionals of single function, Constrained minimization. Minimum principle. Control variable inequality constraints. Control and state variable inequality constraints. Euler Lagrangine Equation.

UNIT -VIII OPTIMAL CONTROL

Formulation of optimal control problem. Minimum time, Minimum energy, minimum fuel problems. State regulator problem. Output regulator problem. Tracking problem, Continuous-Time Linear Regulators.

TEXT BOOKS:

1. Modern Control System Theory – by M. Gopal, New Age International Publishers, 2nd edition, 1996

REFERENCE BOOKS:

1. Modern Control Engineering – by K. Ogata, Prentice Hall of India, 3rd edition, 1998
2. Control Systems Engineering by I.J. Nagarath and M.Gopal, New Age International (P) Ltd.
3. Digital Control and State Variable Methods – by M. Gopal, Tata Mc Graw-Hill Companies, 1997.
4. Systems and Control by Stainslaw H. Zak , Oxford Press, 2003.

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EHV AC TRANSMISSION
(Elective-IV)

Objective: It imparts knowledge on necessity of EHV AC transmission, line and ground reactive parameters, voltage gradients of conductors, voltage control and corona and travelling wave theory and its problems.

Unit – I: Preliminaries:

Necessity of EHV AC transmission – advantages and problems–power handling capacity and line losses-mechanical considerations – resistance of conductors – properties of bundled conductors – bundle spacing and bundle radius- Examples.

Unit – II: Line and ground reactive parameters:

Line inductance and capacitances – sequence inductances and capacitances – modes of propagation – ground return – Examples

Unit – III: Voltage gradients of conductors:

Electrostatics – field of sphere gap – field of line charges and properties – charge – potential relations for multi-conductors – surface voltage gradient on conductors – distribution of voltage gradient on sub-conductors of bundle – Examples.

Unit – IV: Corona effects – I:

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.

Unit – V: Corona effects – II:

Radio interference (RI) - corona pulses generation, properties, limits – frequency spectrum – modes of propagation – excitation function – measurement of RI, RIV and excitation functions – Examples.

Unit – VI: Electro static field:

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- VII: Traveling wave theory

Traveling 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 –VIII: 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. EHVAC Transmission Engineering by R. D. Begamudre, New Age International (p) Ltd.
2. HVAC and DC Transmission by S. Rao

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COMPUTER SYSTEM ORGANIZATION
(Elective-IV)

Objective:

- Is to acquaint budding engineers with the basic principles of organization, operation and performance of modern-day computer systems.
- It covers all aspects of computer technology, from the underlying integrated circuit technology used to construct computer components, to the use of parallel organization concepts in combining those components.

UNIT-I:

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT-II:

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

UNIT – III:

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer

UNIT-IV:

MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit hard wired control. Micro programmed control

UNIT-V:

THE MEMORY SYSTEM: Basic concepts semiconductor RAM memories. Read-only memories Cache memories performance considerations, Virtual memories secondary storage.

UNIT-VI:

INPUT-OUTPUT ORGANIZATION: Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access.

UNIT-VII:

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

UNIT-VIII:

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

TEXT BOOKS:

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

REFERENCES:

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

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FLEXIBLE AC TRANSMISSION SYSTEMS
(Elective-IV)

Objective: It imparts knowledge on necessity of power flow, Dynamic stability and FACTS, voltage source converters, compensators and SVC, STATCOM and its problems, applications.

Unit I : Transmission interconnections, power flow in an AC System, loading capability limits, Power flow and Dynamic stability considerations, importance of controllable parameters.

Unit II : Opportunities for FACTS, basic types of FACTS controllers, benefits from FACTS controllers, Requirements and Characteristics of High Power devices – Voltage and Current rating, losses and speed of switching, parameter trade-off of devices.

Unit III : Basic concept of Voltage source converter, Single phase full wave bridge converter, Single phase-leg (pole) operation, Square-wave voltage harmonics for a single phase Bridge, 3 Phase full wave bridge converter.

Unit IV : Transformer connections for 12 pulse, 24 and 48 pulse operation. Three level voltage source converter, pulse width modulation converter, basic concept of current source converters, comparison of current source converters with voltage source converters.

Unit V : Objectives of shunt compensation, mid point voltage regulation for line segmentation, End of line voltage support to prevent voltage instability, improvement of transient stability, Power oscillation damping.

Unit VI : Methods of controllable var generation: variable impedance type static var generators – TCR and TSR, TSC, FC-TCR, TSC-TCR, switching converter type var generators, hybrid var generators.

Unit VII : SVC and STATCOM : The regulation and slope transfer function and dynamic performance, transient stability enhancement and power oscillation damping, operating point control and summary of compensation control.

Unit VIII : Static series compensators : Concept of series capacitive compensation, improvement of transient stability, power oscillation damping, functional requirements. GTO thyristor controlled series capacitor (GSC), thyristor switched series capacitor (TSSC), and thyristor controlled series capacitor (TCSC), control schemes for GSC, TSSC and TCSC.

Reference Books:

1. "Understanding FACTS " N.G.Hingorani and L.Guygi, IEEE Press. Indian Edition is available:--Standard Publications, 2001.
2. "Flexible a c transmission system (FACTS)" Edited by YONG HUE SONG and ALLAN T JOHNS, Institution of Electrical Engineers, London.

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INDUSTRY ORIENTED MINI PROJECT

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PROJECT

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COMPREHENSIVE VIVA