ACADEMIC REGULATIONS

COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRICAL & ELECTRONICS ENGINEERING

B. Tech. Four Year Degree Course

(Applicable for the batches admitted from 2014-15)

(MR-14 Regulations)

(I, II, III & IV Years Syllabus)

MALLA REDDY ENGINEERING COLLEGE

(AUTONOMOUS)

(An Autonomous institution, Autonomy granted by UGC and affiliated to JNTUH, Accredited by NAAC with 'A' Grade, Accredited by NBA (2008-11) & Recipient of World Bank Assistance under TEQIP phase – II S.C.1.1for the period (2011-14))

Maisammaguda, Dhulapally (Post. Via. Kompally), Secunderabad – 500 100.

Website: www.mrec.ac.in Email: mrec.2002@gmail.com

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

(AUTONOMOUS)

(An Autonomous institution, Autonomy granted by UGC and affiliated to JNTUH, Accredited by NAAC with 'A' Grade, Accredited by NBA (2008-11) & Recipient of World Bank Assistance under TEQIP phase – II S.C.1.1for the period (2011-14))

Maisammaguda, Dhulapally (Post. Via. Kompally), Secunderabad – 500 100.

Website: www.mrec.ac.in Email: mrec.2002@gmail.com

Academic Regulations for B. Tech. (Regular)

(MR14 Regulations)

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

1. **Award of B. Tech. Degree**

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

1.1 The candidate shall pursue a course of study for not less than four academic years and not more than eight academic years.

1.2 **After eight academic years of course of study, the candidate is permitted to write the Examinations for two more years.**

1.3 The candidate shall register for 224 credits and secure 216 credits with compulsory subjects as listed in Table-1.

Table 1: Compulsory Subjects

Serial Number	Subject Particulars
1	All practical subjects
2	Industry oriented mini project
3	Comprehensive Viva-Voce
4	Seminar
5	Project work

2. The students, who fail to fulfill all the academic requirements for the award of the degree within ten academic years from the year of their admission, shall forfeit their seats in B. Tech. course.

3. Courses of study

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

Branch Code	Branch
1	Civil Engineering(CE)
2	Electrical and Electronics Engineering (EEE)
3	Mechanical Engineering(ME)
4	Electronics and Communication Engineering(ECE)
5	Computer Science and Engineering (CSE)
7	Mining Engineering(MNE)

4. Credits

	Semester	
	Periods/ Week	**Credits**
Theory	04	04
	--	--
Practical	03	02
Drawing	Theory - 02 Practical - 03	04
Mini Project	--	02
Comprehensive Viva Voce	--	02
Seminar	--	02
Project	15	10

5 Distribution and Weightage of Marks

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

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

5.3 For theory subjects, during a semester there shall be 2 mid-term examinations. Each mid- term examination consists of one objective paper, one essay paper and one assignment. The objective paper and the essay paper shall be for 10 marks each with a total duration of 1 hour 20 minutes (20 minutes for objective and 60 minutes for essay paper). The Objective paper is set with 20 bits of multiple choices and filling the blanks type of questions for a total of 10 marks. The essay paper shall contain 4 full questions out of which, the student has to answer 2 questions, each carrying 5 marks. While the first mid-term examination shall be conducted in First 2 1/2 units of the syllabus, the second mid-term examination shall be conducted in Remaining 2 1/2 units. Five (5) marks are allocated for Assignments (as specified by the subject teacher concerned). Assignment should be submitted before the end of the first mid-examination, and the second Assignment should be submitted before the conduct of the second mid-examination. The total marks secured by the student in each mid-term examination are evaluated for 25 marks, and the average of the two mid-term examinations shall be taken as the final marks secured by each student. If any student is absent for any subject of a mid-term examination, a re-exam will be conducted in the deserving cases based on the recommendations of College Academic Committee. The end examination will be conducted for 75 marks, which contains PART A and PART B. Part A for 25 marks contains 5 to 8 questions, each two marks and remaining are one mark questions covering the entire syllabus. Part B is for maximum of 50 marks with 5 questions covering from all units consisting of two parts each (a) and (b), Out of which the student has to answer either (a) or (b) not both. Each question in Part B carries 10 marks.

5.4 For practical subjects there shall be a continuous evaluation during a semester for 25 sessional marks and 50 end semester examination marks. Out of the 25 marks for internal evaluation, day-to-day work in the laboratory shall be evaluated for 15 marks and internal practical examination shall be evaluated for 10 marks conducted by the laboratory teacher concerned. The end semester examination shall be conducted with an external examiner and internal examiner. The external examiner shall be appointed by the principal / Chief Controller of examinations

5.5 For the subject having design and/or 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

semester examination. There shall be two internal tests in a Semester and the average of the two shall be considered for the award of marks for internal tests.

5.6 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 a report form and presented before the committee. It shall be evaluated for 50 marks. The committee consists of an **External Examiner**, head of the department, and the supervisor of the mini-project and a senior faculty member of the department. There shall be no internal marks for industry-oriented mini-project.

5.7 There shall be a seminar presentation on specific Applied Engineering Topic 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 of the topic, and submit it to the department. It 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 the seminar.

5.8 There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of Head of the Department and two Senior Faculty members of the Department. The Comprehensive Viva-Voce is intended to assess the students understanding of the subjects he 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.

5.9 Out of a total of 200 marks for the project work, 50 marks will be allotted for Internal Evaluation and 150 marks for the End Semester Examination (Viva Voce). The End Semester Examination of the project work shall be conducted by the same committee as appointed for the 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 one another. The evaluation of project work shall be made at the end of the IV year II Semester. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

5.10 Laboratory marks and the sessional marks awarded by the concerned teacher are subjected to scrutiny and scaling by the Principal / Chief Controller of examinations wherever necessary. In such cases, the sessional and laboratory marks awarded by the concerned teacher will be referred to a Committee headed by principal consisting of HOD, senior professor in that particular department. 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 internal test papers including Lab end exam test papers shall be preserved in the exam branch for a minimum period of 6 years from the commencement of the batch, as per the University norms and shall be produced to the Committees as and when the same are asked for.

6 Attendance Requirements

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

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

6.3 Condonation of shortage of attendance in aggregate up to 10% amounting to 65% and above and below 75% in each semester may be granted by the College Academic Committee.

6.4 A student will not be promoted to next semester unless he satisfies the attendance requirement of the present semester as applicable.

6.4 A student who is short of attendance in a semester has to seek re-admission into that semester as and when offered within 4 weeks from the date of the commencement of class work.

6.5 Students whose shortage of attendance is not condoned in any semester are not eligible to write their end semester examination of that class and their registration Stands cancelled.

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

6.7 A student will be promoted to the next semester if he satisfies the attendance requirement of the present semester, as applicable, including the days of attendance in sports, games, NCC and NSS activities.

6.8 If any candidate fulfills the attendance requirement in the present semester, shall not be eligible for readmission into the same class.

7. Minimum Academic Requirements

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

7.1 A student is deemed to have satisfied the minimum academic requirements if he has earned the credits allotted to each theory/practical design/drawing subject/project and secures not less than 35% of marks in the end semester exam, and minimum 40% of marks in the sum total of the mid-term and end semester exams.

7.2 A student shall be promoted from II to III year only if he fulfills the academic requirement of

34 credits (out of 84 credits) secured from all Regular and Supplementary examinations conducted upto second year first semester examination.

(or)

44 credits (out of 112) secured from all Regular and Supplementary examinations conducted upto second year second semester examination.

7.3 A student shall be **promoted from III year to IV year** only if he fulfills the academic requirements of

56 credits (out of 140 credits) secured from all Regular and Supplementary examinations conducted upto Third year First semester examination.

(or)

68 credits (out of 168) secured from all Regular and Supplementary examinations conducted upto Third year Second semester examination.

7.4 A student shall register and put up minimum attendance in all 224 credits and earn 216 credits. Marks obtained in the best 216 credits shall be considered for the calculation of percentage of marks.

7.5 Students who fail to earn 216 credits as indicated in the course structure within ten academic years (8 years of study + 2 years additionally for appearing for exams only) from the year of their admission, shall forfeit their seat in B.Tech. Course and their admission stands cancelled.

8 Course pattern

8.1 The entire course of study is for four academic years. All 4 years on semester pattern.

8.2 A student, eligible to appear for the end examination in a subject, but absent from it or has failed in the end semester examination, may write the exam in that subject during the period of supplementary exams.

8.3 When a student is detained for lack of credits/shortage of attendance, he may be re-admitted into the next semester. However, the academic regulations under which he was readmitted shall continue to be applicable to him.

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	
First Class with Distinction	70% and above	From the aggregate marks secured from 216 Credits.
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 obtained in internal evaluation and end semester examination shall be shown separately in the memorandum of marks.)

10 Minimum Instruction Days

The minimum instruction days for each semester shall be 90 days.

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

12 Transfer from other colleges will be permitted, as per the rules stipulated by the affiliating University and the State government.

13 WITHHOLDING OF RESULTS

If the student has not paid the dues, if any, to the college or if any case of indiscipline is pending against him, the result of the student will be withheld and he will not be allowed into the next semester. His degree will be withheld in such cases.

14. TRANSITORY REGULATIONS

14.1 Discontinued, detained, or failed candidates are eligible for readmission into that Semester as and when next offered.

14.2 After the revision of the regulations, the students of the previous batches will be given two chances for passing in their failed subjects, one supplementary and the other regular. If the students cannot clear the subjects in the given two chances, they shall be given equivalent subjects as per the revised regulations which they have to pass in order to obtain the required number of credits.

14.3 In case of transferred students from other Universities, the credits shall be transferred to MREC (A) as per the academic regulations and course structure of the MREC (A).

15. GENERAL

15.1 Wherever the words he, him, his, occur in the regulations, they include she, her, hers.

15.2 The academic regulation should be read as a whole for the purpose of any interpretation.

15.3 In case of any doubt or ambiguity in the interpretation of the above rules, the decision of the College Academic Committee is final.

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

.

15.5. The students seeking transfer to MREC from various other Universities / Institutions have to pass the failed subjects which are equivalent to the subjects of MREC, and also pass the subjects of MREC which the candidates have not studied at the earlier Institution on their own without the right to sessional marks. Further, though the students have passed some of the subjects at the earlier institutions, if the same subjects are prescribed in different semesters of MREC, the candidates have to study those subjects in MREC in spite of the fact that those subjects are repeated.

MALLA REDDY ENGINEERING COLLEGE (AUTONOMOUS)

Maisammaguda, Dhulapally (Post via. Kompally), Secunderabad - 500100

ACADEMIC REGULATIONS FOR B. TECH (LATERAL ENTRY SCHEME)

(Effective for the students admitted into II year from the Academic year 2015-2016 onwards)

1 **Eligibility for award of B. Tech. Degree (LES)**

I. The LES candidates shall pursue a course of study for not less than three academic years and not more than six academic years.

II. They shall be permitted to write the examinations for two more years after six academic years of course work.

2. The candidate shall register for 168 credits and secure 160 credits from II to IV year B.Tech. Program (LES) for the award of B.Tech. Degree with compulsory subjects as listed in Table-1

Serial Number	Subject Particulars
1	All practical subjects
2	Industry oriented mini project
3	Comprehensive Viva-Voce
4	Seminar
5	Project work

Table 1: Compulsory Subjects

3. The students, who fail to fulfill the requirement for the award of the degree in 8 consecutive academic years (6 years of study + 2 years additionally for appearing exams only) from the year of admission, shall forfeit their seats.
4. The attendance regulations of B. Tech. (Regular) shall be applicable to B.Tech. (LES).
5. **Promotion Rule**

A student shall be promoted from second year to third year if he fulfills the minimum attendance requirement.

A student shall be promoted from III year to IV year only if he fulfills the academic requirements of

34 credits (out of 84 credits) secured from all Regular and Supplementary examinations conducted upto Third year First semester examination

(or)

44 credits (out of 112) secured from all Regular and Supplementary examinations conducted upto Third year Second semester examination.

6. **Award of Class**

After a student has satisfied the requirement 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	
First Class with Distinction	70% and above	**From the aggregate marks secured from 160 Credits from 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 obtained in the internal evaluation and the end semester examination shall be shown separately in the marks memorandum.)

7. All the other regulations as applicable to **B. Tech. 4-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**
	If the candidate:	
1. (a)	Possesses or keeps accessible in examination hall, any paper, note book, programmable calculators, Cell phones, pager, palm computers or any other form of material concerned with correlated 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 and sent to the University.

3	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall beexpelledfrom 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 candidates also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
5	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.

6	Refuses to obey the orders of the Chief Superintendent/Assistant Superintendent / any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to the person or to any of his relations whether bywords, either spoken or written or by signs or by visible representation, assaults the officer-in charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	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 cases registered against them.
7	Leaves the exam hall taking away answer scripter intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all University examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.

9	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat. Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against them.
10	Comes in a drunken condition to the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/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 University for further action toward suitable punishment.	

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)
Maisammaguda, Dhulapally (Postvia. Kompally), Secunderabad- 500100
B. TECH (Electrical & Electronics Engineering)
MR-14 Regulations

I YEAR- I semester

Code	Subject	L	T/P/D	C
40E01	English - I	3	-/-/-	3
40P01	Engineering Physics - I	4	-/-/-	4
40C01	Engineering Chemistry - I	3	-/-/-	3
40M01	Mathematics - I	4	-/-/-	4
40501	Computer Programming	4	-/-/-	4
40301	Engineering Drawing - I	2	1/-/3	4
40502	Computer Programming Lab	-	-/3/-	2
40P03	Engineering Physics Lab	-	-/3/-	2
40305	Engineering & IT Workshop	-	-/3/-	2
	Total	20	13	28

I YEAR- II semester

Code	Subject	L	T/P/D	C
40E02	English & Professional Ethics	4	1/-/-	4
40P02	Engineering Physics – II	3	-/-/-	3
40C02	Engineering Chemistry – II	3	-/-/-	3
40M02	Mathematics – II	4	1/-/-	4
40M03	Mathematics – III	4	1/-/-	4
40503	Data Structures and Software Tools	4	1/-/-	4
40C03	Engineering Chemistry Lab	-	-/3/-	2
40504	Data structures and Software Tools Lab	-	-/3/-	2
40E03	English Language Communication Skills Lab	-	-/3/-	2
	Total	22	13	28

II year – I Semester

Code	SUBJECT	L	T/P/D	Credits
40M04	Mathematics-IV	4	-	4
40339	Fluid Mechanics and Hydraulic Machinery	4	-	4
40401	Electronic Devices and Circuits	4	-	4
40201	Electrical Circuits	4	-	4
40202	Electromagnetic Fields	4	-	4
40203	Electrical Machines-I	4	-	4
40340	Fluid Mechanics and Hydraulic Machinery Lab	-	3	2
40405	Electronic Devices & circuits Lab	-	3	2
	Total	**24**	**6**	**28**

B.Tech (ELECTRICAL AND ELECTRONICS ENGINEERING)

MR14 Regulations

II year – II Semester

CODE	SUBJECT	L	T/P/D	Credits
40B01	Managerial Economics and Financial Analysis	4	-	4
40204	Power Systems-I	4	-	4
40432	Electronic Circuits	4	-	4
40403	Switching Theory and Logic Design	4	-	4
40205	Network Theory	4	-	4
40206	Electrical Machines-II	4	-	4
40207	Electrical Machines Lab – I	-	3	2
40208	Electrical Circuits and Simulation Lab	-	3	2
	Total	**24**	**6**	**28**

III year – I Semester

CODE	SUBJECT	L	T/P/D	Credits
40412	Linear & Digital IC Applications	4	-	4
40209	Electrical and Electronics Instrumentation	4	-	4
40210	Power Systems-II	4	-	4
40211	Control Systems	4	-	4
40212	Power Electronics	4	-	4
40213	Electrical Machines-III	4	-	4
40214	Electrical Machines Lab – II	-	3	2
40215	Control Systems and Simulation Lab	-	3	2
	Total	**24**	**6**	**28**

III year –II Semester

CODE	SUBJECT	L	T/P/D	Credits
40B02	Management Science	4	-	4
40216	Static Drives	4	-	4
40217	Computer Methods In Power Systems	4	-	4
40433	Microprocessors and Micro controllers	4	-	4
40109	Environmental studies	4	-	4
	Open Elective	4	-	4
402A1	Renewable Energy Sources			
40B05	Intellectual property rights			
40B04	Human values and Professional Ethics			
40218	Electrical & Electronics Measurements lab	-	3	2
40219	Power Electronics and Simulation Lab	-	3	2
	Total	**24**	**6**	**28**

B.Tech (ELECTRICAL AND ELECTRONICS ENGINEERING)

MR14 Regulations

IV year – I Semester

CODE	SUBJECT	L	T/P/D	Credits
40220	Switch Gear and Protection	4	-	4
40221	Utilization of Electrical Energy	4	-	4
40418	Digital signal Processing	4	-	4
40222	Power System Operation and Control	4	-	4
	Elective I	4	-	4
402B1	High Voltage Engineering			
40424	VLSI Design			
402B2	Digital Control Systems			
40534	Data Structures			
	Elective II	4	-	4
40M12	Optimization Techniques			
402C1	Electrical Distribution Systems			
402C2	Electrical Estimation and Costing			
40435	Embedded Systems Design			
40434	Microprocessors and Interfacing Devices lab	-	3	2
40E07	Advanced Communications Skills Lab	-	3	2
	Total	**24**	**6**	**28**

IV year – II Semester

CODE	SUBJECT	L	T/P/D	Credits
40223	Fundamentals of HVDC and Fact Devices	4	-	4
	Elective III	4	-	4
402D1	Neural Networks and Fuzzy Logic			
401A1	Disaster Management			
402D2	Reliability Engineering and its applications to Power Systems			
402D3	Linear System Analysis			
	Elective IV	4	-	4
402E1	Advanced Control Systems			
402E2	EHV AC Transmission			
402E3	Introduction to Nanotechnology			
402E4	Electrical Power Quality			
40224	Industry Oriented Mini Project	0	0	2
40225	Seminar	0	6	2
40226	Project Work	0	15	10
40227	Comprehensive Viva	0	0	2
	Total	**12**	**21**	**28**

2014-2015 **code: 40E01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – I Sem

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

ENGLISH- I
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

1. To facilitate for the improvement of the language proficiency of the students in English with emphasis on Reading and writing skills.
2. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
3. Analyzing intensive reading strategies and discussing how to distinguish between facts and opinions and draw inferences.
4. Enable the students to improve effective writing skills.
5. To develop English Language communication skills in formal and informal situations.

Unit I:
Chapters entitled 'Competition Matters' and 'Light Pollution' from **English Today**, Published by Foundation Books
Vocabulary: parts of speech
Grammar: Articles, Prepositions
Reading: Introduction to Reading Skills, reading comprehension.
Writing: Introduction to writing skills, characteristics of effective writing

Unit II:
Chapters entitled 'Key to Courage' and 'The Eternal Pilgram' from **English Today**, Published by Foundation Books
Vocabulary: formation of words, prefixes, suffixes and root words,
Grammar: Tense, aspect and concord
Reading: Skimming and Scanning
Writing: paragraph writing- use of cohesive devises

Unit III:
Chapters entitled 'The Wonders of the New Millennium' and The Lost Child' from **English Today**, Published by Foundation Books
Reading: reading for details.
Grammar: integrated exercises in error detection and correction in tenses and concord.
Vocabulary: homonyms and homophones
Writing: paragraph writing and arranging jumbled sentences into paragraphs

Unit IV:
Chapters entitled 'A Special Kind of Blessing' and 'How to avoid an Argument' from **English Today**, Published by Foundation Books
Grammar: voice – exercises
Vocabulary: phrasal verbs.
Reading: Note making
Writing: notice and circular writing

Unit V:
Chapters entitled 'Food: Family and Culture' and 'English in India Today: Some Views' from **English Today**, Published by Foundation Books
Grammar: speech- exercises,
Vocabulary: idiomatic expressions
Reading: reading for specific purposes
Writing: Letter writing- both formal and informal.
* Exercises from the texts not prescribed shall also be used for classroom tasks

TEXTBOOK S:
In order to improve the proficiency of the student in the acquisition of Grammar error free language, the following text and course content, divided into Five Units, is prescribed.

1. Text book English Today by K.Durga Bhavani & Co. Published by Foundation Books

For Grammar practice

2. A Work Book on English Grammar and Composition published by Tata Mac Graw –Hill , New Delhi 2012.
3. Headway's Academic Skills-reading, writing and study skills-Level-2 student's book. Oxford publications

REFERENCE BOOKS:

1. Murphy English Grammar (Intermediate)
2. Basic English by Michael Swan
3. Practical English Grammar by Thomson & Martinet
4. Understanding and Using English Grammar by Betty Schrampfer Azar
5. A Communicative Grammar of English by Geoffrey N. Leech
6. Practical English Usage by Michael Swan
7. Oxford Word Skills Basic by Ruth Gairns
8. Improve Your Written English by Marion Field
9. A Student's Introduction to English Grammar (South Asian Edition) 1st Edition by Author: Rodney Huddleston, Geoffrey K. Pullum
10. Essential English Grammar: A Self-Study Reference and Practice Book for Intermediate Students of English with Answers 2nd Edition by Murphy
11. Better English Revised Edition 1st Edition by Norman Lewis
12. Learn English: A Fun Book of Functional Language, Grammar, and Vocabulary 1st Edition (Paperback) by Santanu Sinha Chaudhuri, Tata McGraw Hill Education
13. OXFORD GUIDE TO ENGLISH GRAMMAR 1st Edition by John Eastwod
14. How to Write Correct English (Applied English Grammar) by Rajendra Prasad Sinha
15. Collins Easy Learning Grammar & Punctuation by HarperCollins
16. Vocabulary word power made easy by Norman Lewis

Course Outcomes:

1. Usage of English Language, written and spoken.
2. Enrichment of language accuracy and fluency.
3. Gaining confidence in using flawless English language and skills for writing in real life situations..

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – I Sem

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

ENGINEERING PHYSICS – I
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

1. To teach the students classification of materials based on the arrangement of atoms, basic concepts of crystallography.
2. To make the students learn the concepts of defects in crystals.
3. To make the students understand the concept of SHM, and different kinds of oscillations.
4. To teach the students the concept of dual nature of matter and experimental support to this concept
5. To expose the students to classical free electron theory and quantum free electron theory and their drawbacks.
6. To teach the students the Band theory and classification of materials based on band theory.
7. To make the students understand the concepts of Fermi level and charge carrier concentrations in semi conductors.
8. To make the students get acquainted with the p n junction diode and its characteristics.
9. To teach the basics of Electromagnetic theory.

UNIT I:

Crystallography and Crystal Structures: Classification of materials – Crystalline, Amorphous, Poly crystalline; Lattice point, Space Lattice, Basis, Crystal structure, Unit Cell, Crystallographic axes, Lattice Parameters; Crystal Systems – Bravais Lattices; Atomic Radius, Co-ordination Number and Packing Factor of SC, BCC, FCC and Diamond structures; Crystal Planes and Directions - Miller Indices, Expression for interplanar distance in cubic system

Defects in Crystals: Defects and their classification; Point Defects – Vacancies, Interstitial, Impurities, Electronic defects; Qualitative discussion of Schottky and Frenkel defects; Qualitative treatment of line defects (Edge and Screw dislocations); Burger's Vector

UNIT II:

Oscillations: 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 simple oscillator; Damped oscillations – under damping, critical damping and over damping; Qualitative treatment of Forced vibrations; sharpness of resonance, Qualitative treatment of electrical oscillator circuit containing inductor, capacitor and resistor

UNIT III:

Principles of Quantum Mechanics:Waves and Particles - de Broglie's concept of Matter Waves; Davisson and Germer's experiment; G.P.Thomson's experiment. Heisenberg's Uncertainty Principle; Schrödinger's Time Independent Wave Equation - Physical Significance of the Wave Function; Energy of a particle in a one dimensional infinite potential well.

Band Theory of Solids: Qualitative discussion of Classical free electron theory; Expression for electrical conductivity of metals; Qualitative discussion of Quantum free electron theory; Electron in a periodic Potential (Bloch Theorem), Kronig-Penny Model (Qualitative Treatment), Origin of energy Band formation in solids, Classification of materials into Conductors, Semi Conductors & Insulators, Concept of effective mass of an electron

UNIT IV:

Semiconductor Physics: Introduction, Classification of Semiconductors; Formation of p type and n type materials; Charge carrier concentration in Intrinsic semiconductors; Qualitative treatment of charge carrier concentration in Extrinsic semiconductors; Qualitative treatment of Fermi Level in Intrinsic and Extrinsic Semiconductors; Direct & Indirect Band Gap Semiconductors; Hall Effect; formation of p n junction diode; forward bias and reverse bias, I-V characteristics of pn junction diode; Zener Break down, Avalanche Break down

UNIT V:

Electro Magnetic Theory:

Scalar and Vector fields, Gradient of Scalar field and its physical significance; Divergence and Curl of Vector field; Ampere's Law, Faraday's Law of electromagnetic induction; Induced E.M.F. in a conductor; Lenz's Law, Displacement current, Maxwell equations in differential and integral form, wave equation .

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. Unified Physics Vol – I by S L Gupta and Sanjeev Gupta JNPN Publications.
5. Engineering Physics by B K Panedy, S Chaturvedi, Cengage learning

REFERENCE BOOKS:

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. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
4. Basic Electronics and Linear Circuits by D C Kulshreshtha, S C Gupta, N N Bhargava, TTTI, Chandigarh
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
9. Physics Vol 2 – Resnick, Halliday & Krane – Fifth edition, Wiley Student edition.
10. Physics – B.Sc. First Year by Dr B Sanjeeva Rao, et al, Telugu Akademi

Course Outcomes:

1. Students shall learn the classification of materials into three categories. With an emphasis on Crystals, they shall learn the concepts of unit cell and Bravais lattices and evaluation of packing factors for different cubic structures and diamond structure.
2. Students shall learn in detail about various point defects like Vacancies, interstitials etc and extend their understanding up to one dimensional defect like Edge and screw dislocations.
3. Student shall understand and appreciate the physics behind the mathematical equations that govern free oscillations, damped oscillations and forced oscillations. Also they shall understand the concept of resonance
4. Students shall get introduced to the fascinating world of quantum mechanics with the basic and key concepts like de Broglie's concept of matter waves and the experimental support given by Davisson and Germer and G.P.Thomson and learn to solve the Particle in one dimensional infinite potential well problem.
5. Students shall learn the Kronig – Penney model which gives rise to Band theory of solids. Also they understand the concept of effective mass of electron.
6. Students shall learn the mathematical treatment of charge carrier concentration in intrinsic and extrinsic semi conductors. Also they shall learn a very interesting phenomenon called Hall Effect and its applications besides learning pn junction diode, its characteristics and the associated breakdown mechanisms.
7. They shall be able to understand the Faraday's laws of electromagnetism and get introduced to Maxwell's equations.

2014-2015 **Code: 40C01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – I Sem

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

ENGINEERING CHEMISTRY – I
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course objectives:

To make the students to understand the basic concepts of chemistry to develop futuristic materials for high-tech application in the area of engineering.

1. Explore the economically viable technologies developed for utilizing water resources and recycle them. To provide basic skills in chemical analysis of water and materials.
2. Study of chemistry of portable energy storage devices like various conventional as well as modern batteries and their usage in different aspects of life.
3. Gain the knowledge of corrosion science and anti corrosive techniques to protect faster corrosion and monitoring of corrosion.
4. To predict and control properties through an understanding of atomic, molecular, crystalline and microscopic structures of engineering materials.

UNIT I:

Water technology I :

Hardness of Water: Causes of hardness, expression of hardness – units – types of hardness, estimation of temporary & permanent hardness of water by EDTA method - numerical problems. Boiler troubles – Scale & sludges, Priming and foaming, caustic enbrittlement and boiler corrosion; Treatment of boiler feed water – Internal treatment (Phosphate, Colloidal, carbonate and calgon conditioning) .

UNIT II:

Water technology II:

External treatment – Lime Soda process, Zeolite process and ion exchange process. Numerical Problems. Potable Water- Its Specifications – Steps involved in treatment of potable water – Disinfection of water by chlorination and ozonisation. Reverse osmosis, Electro dialysis and their significance.

UNIT III:

Electrochemistry: Electro Chemical Cells: EMF: Galvanic Cells, types of Electrodes – (Calomel, Quinhydrone and glass electrodes); Nernst equation and its applications ; concentration cells; classification with examples, electro chemical series, Potentiometric titrations, determination of p^H using glass electrode-Numerical problems. Batteries: Primary cells (dry cells) and secondary cells (lead-Acid cell, Ni-Cd cell). Applications of batteries. Fuel cells – Hydrogen – Oxygen fuel cell; Advantages and Applications.

UNIT IV:

Corrosion and its control: Causes and effects of corrosion; Theories of corrosion – Chemical & Electrochemical corrosion; Types of corrosion (Galvanic, Water line, Pitting and Inter granular); Factors affecting rate of corrosion – Nature of metal and Nature of Environment – Corrosion control methods – Cathodic protection (sacrificial anodic and impressed current). Surface coatings: Metallic coatings & methods of application of metallic coatings - hot dipping (galvanization & tinning), Cementation, cladding, electroplating (copper plating) Electro less plating (Ni plating**).**

UNIT V:

Material chemistry: Lubricants: Classification with examples- Characteristics of a good lubricant & properties of lubricants: viscosity, Cloud point, flash and fire points. **Refractories**: Classification, characteristics of a good refractory and applications. **Nanomaterials**: Introduction, preparation by sol-gel & chemical vapor deposition methods. Applications of nano materials

TEXT BOOKS:

1. P. C. Jain and Monica Jain, A text Book of Engineering Chemistry, Dhanapat Rai Publications, New Delhi, 12th Edition 2006.
2. R.V. Gadag and Nithyananda Shetty, A text Book of Engineering Chemistry. I.K International publishing house. Edition 2012.

REFERENCE BOOKS:

1. F.W. Billmeyer, Text Book of Polymer Science, John Wiley & Sons, 4nd Edition, 1996.
2. M.G. Fontana, N. D. Greene, Corrosion Engineering, McGraw Hill Publications, New York, 3rd Edition, 1996.
3. Principles of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand

Course Outcomes:

1. Analyze the water samples and will have the knowledge to prepare potable water using different techniques.
2. Have concept on different batteries & fuel cells and their Applications.
3. Interpret the reasons of corrosion and will be monitor them by using the proper technique
4. Be able to apply core concepts in Materials Science to solve engineering problems.

2014-2015 **code: 40M01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – I Sem

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

MATHEMATICS – I
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

1. Finding inverse of a matrix by elementary transformations
2. Solving system of simultaneous equations
3. Calculate the powers of the matrix & Calculate the inverse of the matrix by CHT
4. Know about the properties of the Eigen values and Vectors, Quadratic forms
5. Know the Applications of second order differential equations
6. Converts a real life problem into a differential equation

UNIT I:

Matrices and Linear systems of equations: Rank of the matrix - Elementary transformations –Echelon form - Normal form – PAQ Form - Inverse from Elementary matrices – Solution of Linear Systems – Consistency of Linear system of equations – Linear and Orthogonal Transformations –Linearly independent and dependent of vectors-LU Decomposition- LU Decomposition from Gauss Elimination –Solution of Tri-diagonal Systems

UNIT II:

Eigen Values, Eigen Vectors, Complex matrices : Eigen values, Eigen vectors – properties – Cayley-Hamilton Theorem (without Proof) - Inverse and powers of a matrix by Cayley-Hamilton theorem. Diagonolization of matrix- Calculation of powers of matrix – Modal and spectral matrices. Real matrices – Symmetric, skew – symmetric. Complex Matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and Eigen vectors of complex matrices and their properties.

UNIT III:

Quadratic forms, Ordinary Differential Equations of First Order:G^{-1} – MP inverse- Singular value decomposition Quadratic forms , Reduction of quadratic form to canonical form – Rank- Nature - index – signature of Quadratic forms.
Applications of First Order Differential Equations: Orthogonal trajectories, Newton's Law of cooling, Law of natural growth and decay.

UNIT IV:

Differential Equations of Second & Higher Order : Definitions- Complete Solutions –Rules for finding Complementary function-Particular integral (R.H.S of the type e^{ax} , $Sin\,ax$, $Cos\,ax$, $Polynomial\ in\ x$, $e^{ax}V(x)$, $x^m v(x)$) and Method of variation of Parameters.

UNIT V:

Laplace Transforms: Definition of Laplace transform, Condition for existence –L.T. of standard functions –Properties of L.T. Transforms of Periodic function, derivatives and integrals – Multiplication by t^n - division by t -Evolution of Integrals - Inverse Transforms- Other methods of finding Inverse Transforms. Convolution theorem –Application of Laplace transforms to ordinary differential equations - Dirac's delta function – Unit step function.

TEXT BOOKS:

1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Introduction to Matrix Analysis by Richard Bellman, Dover Publications
4. Differential Equations by Shepley L Ross, Wiley Publications

REFERENCE BOOKS:

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain&S.R.K. Iyengar,3rd edition, Narosa Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prism Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press ,Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

Course Outcomes:

1. Applies the Theory of Matrices in solving n number of equations
2 Understands how to convert problems in engineering to differential equations
3 Understands the applications of differential equations in second and higher order
4 Understands the Newton's Law of cooling, Law of Natural growth or Decay

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

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

COMPUTER PROGRAMMING
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course objectives

1. Learn how to write modular, efficient and readable C programs
2. Declare and manipulate single and multi-dimensional arrays of the C data types.
3. Describe the techniques for creating program modules in C using functions and recursive functions.
4. Create and manage derived data types and perform operations on files.
5. Utilize pointers and dynamic memory allocation functions to efficiently solve problems.
6. To provide an overview on current technologies in Software Industry like Open Source-LINUX and PHP.

UNIT I: Computer fundamentals-Hardware, Software, Programming languages, Translators, Overview of Operating System, Program Development steps-Algorithm, Flow chart; Number Systems,
Introduction to C Language – History, Simple C Program, Identifiers, Basic data types, User defined data types, Variables, Constants, Type qualifiers, Managing Input / Output, Operators, Precedence and Associativity, Expression Evaluation, Type conversions, Simple C Programming examples.

UNIT II: Conditional Statements – if and switch statements, Loop Control Statements – while, for, do-while statements, C Programming examples, Other statements related to control statements – break, continue, goto, C Programming examples.
Arrays– Basic concepts, One-dimensional arrays, Two–dimensional arrays, Multi-dimensional arrays, C programming examples.

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

UNIT III: Introduction to Structured Programming- Functions- Basics, User defined functions, Inter function communication, Standard functions, Storage Classes-auto, register, static, extern, Scope rules, Array and string manipulations using functions, Recursive functions, C programming examples.
Derived types – Structures – Basic concepts, Nested structures, Arrays of structures, Structure manipulations using functions, Unions, bit fields, C programming examples.

UNIT IV: Pointers – Basic concepts, Pointer arithmetic, Pointers and functions, Pointers and strings, Pointers and arrays, Pointers and structures, Self-referential structures, C programming examples.
Preprocessor Directives-include, define, etc., Dynamic Memory Allocation.

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

UNIT V: Open Source: Introduction to Open Standard, Open Standards Model, Standards and Applications, Open Source Software and Technology.
Linux: History, Properties, Flavors, Introduction to file system, Basic commands and shell programming, Execution of c programs.
PHP: - History, Features of PHP, Key Driver of LAMP Stack, PHP Deployment Platform – Sample web site using PHP.

TEXT BOOKS:

1. Programming in C by Pradip Dey, Manas Ghosh – Second Edition, Oxford University Press.
2. C programming: A Problem-Solving Approach by Behrouz A. Forouzan, E.V.Prasad, Richard F.Gilberg – First Edition, Cengage Learning Press
3. C How to Program by Paul Deitel and Harvey Deitel – Seventh Edition, PH.
4. C Programming and Data Structures by E Balagurusamy, Second Edition, Tata McGraw Hill.
5. Introduction to Linux-A Beginner's Guide by Machtelt Garrels
6. Beginning PHP 5.3, by Matt Doyle, SPD/Wrox Press-2011

REFERENCES:

1. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie – Second Edition, PH.
2. C Programming: Absolute beginner's guide by Greg Perry and Dean Miller, Third Edition, QUE Publishers.
3. Let Us C by Yashwant Kanetkar – Fifth Edition, BPB Publications.

Course Outcomes:

Upon completion of the course, the students are expected to:

1. Write, compile and debug programs in C language.
2. Use different data types in a computer program.
3. Design programs involving decision structures, loops, arrays and functions.
4. Explain the difference between call-by-value and call-by-reference
5. Understand the dynamic allocation of memory by using pointers.
6. Use different file operations to create/update basic data files.
7. Use the basic commands of Linux
8. Able to create basic web pages using PHP Deployment

2014-15 **Code: 40301**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech I-sem. **L T/P/D C**
2 1/-/3 4

ENGINEERING DRAWING – I
(Common to CE/EEE/ME/ECE/CSE/Mining)

Pre-requisite: Knowledge in Mathematics

Course Objective:

- The objective of this subject is to provide the basic concepts in projections, technical drawing, dimensioning and specifications.

UNIT – I

Introduction To Engineering Drawing: Principles of Engineering Drawing/Graphics – Various Drawing Instruments – Conventions in Drawing –

Lettering Practice – BIS Conventions.

Curves: Constructions of Curves used in Engineering Practice:

a) Conic Sections - Construction of ellipse, parabola by different methods and hyperbola by general method.

b) Cycloid, Epicycloid and Hypocycloid

c) Involute - circle, polygon.

Tangent and normal for all the curves(a, b & c)

UNIT – II

Orthographic Projections in First Angle

Projection: Principles of Orthographic Projections – Conventions – First Angle projections.

Projections of Points.-Including Points in all four quadrants.

Projections of Lines - Parallel, perpendicular, inclined to one plane and inclined to both planes. True length and true angle and traces of a line.

UNIT – III

Projections of Planes: Plane parallel, perpendicular and inclined to one reference plane. Plane inclined to both the reference planes.

UNIT – IV

Projections of Solids: Projections of regular solids, cube, prisms, pyramids, tetrahedron, cylinder and cone, axis inclined to one and both the planes.

UNIT – V

Isometric Projections : Principles of Isometric Projection – Isometric Scale – Isometric Views– Conventions –Plane Figures, Simple and Compound Solids – Isometric Projection of objects having non- isometric lines. Isometric Projection of parts with Spherical surface.

Transformation of Projections: Conversion of Isometric Views to Orthographic Views. Conversion of orthographic views to isometric views – simple objects.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhat / Charotar Publications
2. Engineering Drawing - Basant Agrawal, TMH

REFERENCES:

1. Engineering Drawing - P.J. Shah/S.Chand Publications
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 Publications
6. Engineering Drawing , Venugopal / New age Publications

Course Outcome:

- At the end of learning this course the student shall be able to interpret the drawing commonly used in Engineering practice and manufacturing drawing.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

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

COMPUTER PROGRAMMING LAB
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course objectives:

1. Gain practical knowledge of C programming to write modular, efficient and readable C programs by identifying the structural elements and layout of C source code.
2. Declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions.
3. Use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions.
4. Manipulate character strings in C programs. Utilize pointers to efficiently solve problems.
5. Allocate memory to variables dynamically and Perform operations on text and binary files.
6. Learns basic commands of Linux
7. Learns basics of PHP

Week l:
Practice various DOS internal and external commands.

Week 2:

a) Practice various Menu items and debugging techniques in IDE.
b) Practicing sample C programs using Conversion specification.
c) Implement various programs logics using algorithms and flowcharts.

Week 3:
a) Write a C program to find smallest and largest of given three numbers.
b) Write a C program to find the roots of a quadratic equation.
c) Write a C program to implement basic arithmetic operations.

Week 4:
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 find whether the given number is palindrome, perfect, Armstrong or strong.
d) Write a C program to generate all the prime numbers between n1 and n2, where n1 and n2 are values supplied by the user.

Week 5:
Write C programs that use both recursive and non-recursive functions
a) To find the factorial of a given integer.
b) To find the GCD (greatest common divisor) of two given integers.

Week 6:
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 7:
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
c) Write a C program to find substring in a given string.
d) Write a C program to count the lines, words and characters in a given text.

Week 8:
a) Write a C program to construct a pyramid of numbers.

b) Write a C program to generate Pascal's triangle.

Week 9:

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

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 10:

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 11:

a) 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.)

b) Write a C program to find grades of a student's using structures and unions.

Week 12:

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 13:

a) Practicing basic LINUX commands

b) Write simple shell programs

Week 14:

Develop a sample web Pages using PHP

Course Outcomes:

Upon completion of the course, the students are expected to:

1. Understand the basic terminology used in computer programming and to write, compile and debug programs in C language.
2. Design programs involving decision structures, loops, arrays and functions.
3. Understand the dynamics of memory by the use of pointers.
4. Use different file operations to create/update basic data files.
5. Familiarizes with basics of LINUX and PHP

2014-2015 **code: 40P03**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – I Sem

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

ENGINEERING PHYSICS LAB

Course Objectives:

1. To motivate the student to gain experimental skills, working with various measuring instruments.
2. To learn the basic circuit designing concepts.

Experiments:

*Any Ten experiments compulsory

1. Dispersion of Light –Dispersive power of material of a given glass and calcite prism
2. Diffraction grating – Determination of the wavelength of a Sodium vapour lamp.
3. Newton's Rings – Radius of curvature of Plano convex lens
4. Melde's Experiment – Longitudinal and Transverse modes
5. Study of RC time constant and RL circuit.
6. The series RLC circuit – determination of resonant frequency, bandwidth and quality factor.
7. Magnetic field along the axis of current carrying circular coil- Stewart and Gee's experiment.
8. LASER- Diffraction due to single slit and double slit.
9. Evaluation of Numerical aperture of the given fiber.
10. Energy band –gap of a material of a P-N junction diode.
11. Torsional Pendulum- Determination of Rigidity modulus of two different wires.
12. Sonometer- Frequency of A.C supply
13. LASER diode – I-V characteristics.
14. Michelson interferometer (Demonstration only)
15. Hall Sensor (Demonstration only)

Laboratory Manual:

Engineering Physics Practices by Dr. B.Srinivasa Rao, Kesava Vamsikrishna.V, K.S. Rudramamba (University Science Press)

Course Outcomes:

1. Various experiments related to Optics, Mechanics, Electrical and Electronics areas help the student understand the subtle concepts in a practical way.
2. Also the labs sessions inculcate the sense of team work.
3. Working with various measuring instruments help the student gain experimental skills.
4. Interpretation and analysis of data are also learnt by the student.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

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

ENGINEERING & IT WORKSHOP
(Common to CE/EEE/ME/ECE/CSE/Mining)

ENGINEERING WORKSHOP

Pre-requisite: Nil

Course Objective:

To provide the basic concepts about tools used in different trades like Fitting, Carpentry, House wiring, Tin smithy etc in Engineering Workshop.

Codes/Tables: Nil

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.

2. TRADES FOR DEMONSTRATION

1. Machine Shop
2. Plumbing

TEXT BOOKS:

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

Course Outcome:

The students shall be capable to do house wiring, tinsmith, fitting, foundry, carpentry and do some maintenance of wooden furniture. This subject/ practice keep the students a habit of life-long learning.

IT WORKSHOP

Course Objectives:

1. To study/demonstrate the concepts of computer w.r.t. its hardware, operating system, assembling and disassembling.
2. To conduct the experiments related to IT Workshop, installations

List of Tasks:

1. Computer Hardware: Identification of Peripherals
2. Assembling and disassembling of a PC
3. Simple diagnostic exercises – Related to hardware
4. Installation of Windows Operating System
5. Installation of Linux Operating System
6. Simple diagnostic exercises –Related to Operating System
7. Design the applications using following features of MS Word
   a) Letter
   b) Header and footer
   c) Hyperlink, Bullets and numbering
   d) Inserting various objects
   e) Spelling and grammar checking
   f) Tables
   g) Mail merge
9. Design the applications using following features of MS Excel

a) Formulas
b) Functions
c) Conditional formatting
d) Sorting
e) Filters

10. Design the applications using following features of MS Powerpoint
    a) Design Templates
    b) Layouts
    c) Inserting Objects
    d) Custom Animation
    e) Macros
11. Designing the same applications(8,9 & 10) using Open Office.

TEXTBOOKS:

1. IT Essentials PC Hardware and Software Companion Guide Third Edition by Davis Anfinson and Ken Quamme CISC Press, Pearson Education.
2. PC Hardware and A+ Handbook – Kate J. Chase PHI (Microsoft).

Course Outcomes:

Students will be able to:

1. Identify, assemble, dissemble, install and
2. Write commands for a given configuration of a computer.
3. Familiarizes with MS Word, Excel, Power Point and Open Office.

2014-2015 **Code: 40E02**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

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

ENGLISH &PROFESSIONAL ETHICS
(Common to CE/EEE/ME/ECE/CSE/Mining)

Introduction:

There is an increasing concern over the English language competency of Engineering students based on their academic and professional performance. The transformation and the mistreatment of language in the social networking over the last decade have greatly affected the language skills of the students. In keeping with the language skill deficiencies, the present syllabus is designed to hone not only the traditional LSRW skills but also their analytical skills that enable to think too in English. This effective approach to develop English Language competency among the Engineering students aims to kindle the thinking skills to communicate effectively. The classroom activities based on the textbook may be used to build confidence among the students as they become active participants and teachers taking the role of a facilitator.

In the English classes, the focus is on the grammar, vocabulary, reading and, writing. 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 focus is on language error detection as well as correction along with honing vocabulary, reading skills, and writing skills.

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

This course also has a few elements on professional ethics and human values. It helps the students know their responsibility towards the society and instills in students, a sense of respect towards harnessing values of life and spirit of fulfilling social responsibilities

Course Objectives:

1. To facilitate for the improvement of the language proficiency of the students in English with emphasis on Reading and writing skills.
2. To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
3. Analyzing intensive reading strategies and discussing how to distinguish between facts and opinions and draw inferences.
4. Enable the students to improve effective writing skills.
5. To develop English Language communication skills in formal and informal situations.
6. To create an awareness on Engineering Ethics and Human Values.
7. To understand social responsibility of an engineer.
8. To appreciate ethical dilemma while discharging duties in professional life.
9. To mould the students to the needs of the world.

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
• Scanning
• Recognizing coherence/sequencing of sentences

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

Writing Skills:

Objectives

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
- Circular writing
- Memo writing
- Report writing

UNIT I:
Chapters entitled "The Dream and the Message" and "Give Us a Role Model" from Ignited **Minds** by A.P.J. Abdul Kalam, Penguin Books.
Vocabulary: synonyms and antonyms.
Grammar: question tags, exercises related to questions.
Reading: Intensive Reading and Extensive Reading.
Writing: essay writing.

UNIT II:
Chapters entitled "Visionary Teachers and Scientists" and "Learning from Saints and Seers" from **Ignited Minds** by A.P.J. Abdul Kalam, penguin Books.
Vocabulary: words often confused, idioms and phrases
Grammar: degrees of comparison- exercises.
Reading**:** Reading for themes and gists
Writing: summarizing

UNIT III:
Chapters entitled "Patriotism beyond Politics and Religion" and "The Knowledge Society" from Ignited **Minds** by A.P.J. Abdul Kalam, , Penguin Books.
Grammar: types of sentences, transformation of sentences- simple , complex and compound sentences.
Vocabulary: one word substitutions.
Reading: reading for interpretation
Writing. Writing instructions

UNIT IV:
Chapters entitled "Getting the Forces Together" and "Building a New State" from **Ignited Minds** by A.P.J. Abdul Kalam, , Penguin Books.
Grammar: Conditionals- exercises.
Vocabulary: e-register, foreign expressions.
Reading: critical reading.
Writing: memo writing, review writing

UNIT V:
Chapter entitled "To My Countrymen" from **Ignited Minds** by A.P.J. Abdul Kalam, , Penguin Books.
Grammar: Common errors and integrated exercises.
Vocabulary: gender sensitive language, integrated exercises in vocabulary.
Reading: survey, question, read, recall and review.
Writing - Note-making, Report writing, types of reports

UNIT VI: Introduction to Engineering Ethics- Definition; Purpose of studying Ethics in Engineering. Engineers as Social Experimenters and Safety Officers, Learning from the past, Knowledge gained, Responsible Experimenters, Accountability, Assessment of Safety and Risk, Risk benefit analyses and reducing risk.
- Field work could be assigned to the students- interaction with the "real" Safety Officers

UNIT VII:
Responsibilities to Employers, Respect for Authority, confidentiality; conflicts of interest-Impairment of Judgment & Service, Gifts & Bribes, Moral Status; Occupational crime, Antidiscrimination Laws, Sexual harassment, Global Issues; Engineers- Leaders, Environmental/ Bio ethics, Computer Ethics, Hacking, Cyber Crime, Engineers as Managers, Moral Leadership
- Field work could be assigned – take up a role of a leader and work on any issue.

*unit VI&VII are to be tested only for internal evaluation. They are not meant for end semester examination.
*midterm I will cover unit1-3, midterm II will cover unit4-7.
* project based on field work in teams will carry 5marks.

TEXT BOOKS:

1. Ignited Minds by A. P. J. Abdul Kalam, Penguin Books.
2. Ethics in Engineering by Mike Martin and Roland Schinzinger , McGraw-Hill.

REFERENCE BOOKS:

1. Sharon J. Gerson Steve M. Gerson, "Technical Writing", New Delhi, Pearson education
2. Professional Report Writing by Simon Mort
3. Cambridge English for Engineering : Student's Book, Mark Ibbotson , PB + 2 ACD, ISBN:
4. English for Engineers, Regional Institute of English; Bangalore, PB + CD - ROM, ISBN:
5. Resonance: English for Engineers and Technologists, Dr. K. Elango; Dr. Veena Selvam; Dr. P. R. Sujatha Priyadarshini,
6. A Course in Communication Skills, P Kiranmai Dutt ; Geetha Rajeevan ; C.L.N. Prakash , PB
7. Developing Language and Communication Skills through Effective Small Group Work : SPIRALS: From 3-8, Marion Nash ; Jackie Lowe ; Tracey Palmer , PB
8. Technical Report Writing Today by Daniel G Reordan
9. Comprehension Connections: Bridges to Strategic Reading by Tanny McGregor
10. Keys to Comprehension: How to Help Your Kids Read It and Get It! By Susan Zimmermann
11. Deeper Reading by Kelly Gallagher
12. Notice and Note: Strategies for Close Reading by Kylene Beers
13. Cambridge English Skills Real Reading 3 with Answers by Liz Driscoll
14. Inferences & Drawing Conclusions: 35 Reading Passages for Comprehension by Linda Ward Beech

Course Outcomes:

1. Usage of English Language, written and spoken.
2. Enrichment of comprehension and fluency
3. Improving effective writing skills in personal and professional life.
4. The learners recognize ethical responsibilities of engineers and suggest ways to deal with ethical issues in engineering.
5. The learners can reach an ethically justified or morally reasoned practical solution to an ethical problem with an appropriate plan of action.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

ENGINEERING PHYSICS – II
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

1. To teach the students the phenomenon of Interference, Diffraction and Polarization.
2. To make the students aware of X – ray diffraction and different techniques of it.
3. To make the students understand the characteristics of LASER, different working LASERs.
4. To teach various applications of LASERs.
5. To teach the students, basic definitions related to Dielectric materials, different kinds of polarization, and different Dielectric materials.
6. To introduce them the phenomenon of superconductivity and its applications.
7. To teach the students the significance of nano size and its fascinating applications.
8. To teach the students working principle of optical fiber, classification of optical fibers and applications of optical fibers.
9. To teach the production and detection of ultrasonics and their applications.

UNIT I:

Optics: Introduction to Interference, Young's double slit experiment (Qualitative) – Optical path difference and Fringe width – Interference in thin films (Reflected light) Cosine law – Newton's rings experiment – Determination of wavelength of light. Basic Principles of X – ray diffraction - Bragg's Law, Bragg's X-Ray Spectrometer. Laue Method, Powder Method. Introduction to Polarization, Polarization of Light, Plane of Polarization, Double Refraction, Nicols's prism.

UNIT II:

Laser: Characteristics of LASER; Absorption, Spontaneous and Stimulated transitions; Einstein's Coefficients and Relations between them; Population Inversion; Pumping – Optical and Electrical; Meta-stable State; Three and Four level pumping schemes; Ruby LASER; Helium-Neon LASER; Semiconductor Diode LASER; Applications of LASER – Data storage, Medical, Scientific and industrial

UNIT III:

Dielectric Properties: Electric Dipole, Dipole Moment, Dielectric Constant, Polarizability, Electric Susceptibility, Displacement Vector; Electronic, Ionic and Orientation Polarizations; Expressions for electronic and ionic Polarizabilities; Qualitative treatment of Internal Field in dielectrics; Clausius - Mossotti Equation; Piezo-electricity and Ferro- electricity

Superconductivity: Concept of Perfect Diamagnetism; Meissner effect – Magnetic levitation; Type I and II Superconductors; Applications of Superconductors

UNIT IV:

Nano Technology: Introduction, Surface to volume ratio, Quantum confinement, Change of Electrical, magnetic and optical properties with size, Synthesis of nano materials – Sol-gel method, PVD; Characterization by TEM, applications.

Fiber Optics: Principle of Optical Fiber; Acceptance angle and Acceptance cone, Numerical Aperture; Step and Graded index Optical Fibers and their Refractive Index profiles; Attenuation in Optical Fibers, Application of Optical Fibers – Medical, Level sensor and Communication system.

UNIT V:

Ultrasonics: Introduction, Production of Ultrasonic waves – Magnetostriction method, Piezo electric method; Detection of ultrasonics – Piezo electric detector, Kundt's tube, Sensitive flame method, Thermal detector; Properties of Ultrasonic waves; Applications – Communication, Industrial, Biological and medical.

Acoustics:Basic requirements of acoustically good Hall; Reverberation; Sabine's formula for Reverberation Time (Qualitative Treatment); Factors Affecting the Architectural Acoustics and their Remedies.

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. Unified Physics Vol – I by S L Gupta and Sanjeev Gupta JNPN Publications.
5. Unified Physics Vol – II by S L Gupta and Sanjeev Gupta JNPN Publications.
6. Engineering Physics by B K Panedy, S Chaturvedi, Cengage learning
7. A Text book of Optics by N Subrahmanyam, Brijlal and M N Avadhanulu, S Chand & Co,

REFERENCE BOOKS:

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. Introduction to Solid State Physics – C. Kittel (Wiley Eastern).
4. Engineering Physics by R K Gaur and S L Gupta, Dhanpat Rai and Sons.
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
9. Physics Vol 2 – Resnick, Halliday & Krane – Fifth edition, Wiley Student edition.

Course Outcomes:

1. Students get introduced to the phenomenon of interference and understand the very famous Young's double slit experiment and Newton's rings experiment.
2. They shall understand the concept of X – ray diffraction and the two techniques Laue method and Powder method.
3. Students shall understand the theory of Double refraction as far as Polarization phenomenon is concerned.
4. Students shall be able to distinguish ordinary light and LASER. They shall learn the physics behind the production of LASER.
5. They shall understand and appreciate the applications of LASER.
6. The students shall be able to distinguish Electronic, Ionic and orientation polarizations, understand the significance of the Clausius – Mossotti relation.
7. The students shall learn regarding Piezo electric materials also.
8. They shall learn Meissner effect and be able to understand the classification of superconductors into two categories.
9. They shall be able to understand and appreciate the applications of Superconductivity.
10. Students shall understand the influence of size of the material on its properties.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

ENGINEERING CHEMISTRY– II
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course objectives:

1. Understand various techniques involved in polymerization and application of polymer technology in the area of various engineering fields and manufacturing process of important metallurgical materials.
2. Describe the fundamental aspects of colloids, surface chemistry and properties of multi-phase systems
3. Understanding how light interacts with matter and how it can be used to quantitatively understand chemical samples & engineering materials.
4. To learn about types of fuels and their characteristics, and combustion systems with emphasis on engineering applications.

UNIT I :

Polymers I: Classification of Polymers, Types of Polymerization (Chain (Free radical Mechanism) & Step growth). Plastics**:** Thermoplastic & Thermo setting resins, Compounding & fabrication of plastics (Compression and injection moulding). Preparation, properties, engineering applications of PVC, Teflon and Bakelite.Fibers**-** Characteristics of fibers – preparation, properties and uses of Nylon – 6,6 and Dacron – Fiber Reinforced Plastics (FRP) – applications.

UNIT II:

Polymers II : Rubbers – Natural rubber and its processing (vulcanization). Elastomers – Buna-s, Butyl rubber. Conducting polymers: Polyacetylene, Polyaniline, Mechanism of Conduction, doping; applications of Conducting polymers. Bio-degradable Polymers- preparation and Applications of Poly vinyl acetate and Poly lactic acid .Liquid Crystal Polymers and its Application.

UNIT III:

Photochemistry and Spectroscopy: Photochemistry: Laws of photochemistry - Grotthuss–Draper law, Stark–Einstein law and Lambert-Beer Law. Quantum efficiency – determination Spectroscopy: Electromagnetic spectrum - Absorption of radiation – Electronic, Vibrational and rotational transitions. UV-visible spectroscopy – principles, instrumentation and Applications (Block diagram only).

UNIT IV:

Phase rule & Surface chemistry: Phase Rule**:** Definition of terms: Phase, component, degree of freedom, phase rule equation. Phase diagrams –one component system- water system. Two component system Lead- Silver System. Adsorption: Types of Adsorption, Isotherms – Freundlich and Langmuir adsorption isotherm, applications of adsorption. Colloids: Classification of Colloids; Electrical & optical properties, micelles, applications of colloids in industry.

UNIT V:

Fuels & Combustion: Fuels – Classification – solid fuels: coal – analysis of coal - proximate and ultimate analysis and their significance. Liquid fuels – petroleum and its refining – cracking – types – fixed bed catalytic cracking. Knocking – octane and cetane rating, synthetic petrol, Fischer-Tropsch's process: Gaseous fuels - constituents, characteristics and applications of natural gas, LPG and CNG. Analysis of flue gas by Orsat's apparatus.

Combustion: Definition, Calorific value of fuel – HCV, LCV; Determination of calorific value by Junker's gas calorimeter – Numerical problems on combustion.

TEXT BOOKS:

1. Engineering Chemistry by R.P. Mani,K.N. Mishra, B. Rama Devi /CENGAGE learning.
2. Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008).

REFERENCE BOOKS:

1. Engineering Chemistry by B. Siva Shankar Mc.Graw Hill Publishing Company Limited, New Delhi (2006)
2. Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills Publishing Company Limited, New Delhi (2004).
3. Text Book of Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co Publishers, New Delhi(2006)
4. Chemistry of Engineering Materials by CV Agarwal,C.P Murthy, A.Naidu, BS Publications

Course Outcomes:

1. Demonstrate general knowledge and understanding concerning properties and use of polymeric materials, including knowledge and understanding of related environmental aspects.
2. The student will obtain an understanding of interactions between surfaces and gases, liquids or solutions, and how interfaces are important in many technological and biological processes.
3. Use of spectroscopy to characterize organic compounds. Students will use spectroscopic data to make meaningful observations about the chemical properties of compounds.

Understand and analyze the combustion mechanisms of various fuels

2014-2015 **Code: 40M02**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

MATHEMATICS – II
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

1. In engineering applications, data collected from the field are usually discrete and the physical meanings of the data are not always well known. To estimate the outcomes and, eventually, to have a better understanding of the physical phenomenon, a more analytically controllable function that fits the field data is desirable.
2. The process of estimating the outcomes in between sampled data points is called interpolation; whereas the process of estimating the outcomes beyond the range covered by the existing data is called extrapolation.
3. Understand the Rolles' theorem using intermediate value theorem ,Mean using Lagrange Mean Value theorem ,Cauchy Mean value theorem
4. Understand the beta function and relation between beta and gamma functions, Applications of beta, gamma functions in finding areas etc.,Applications of integration in Cartesian, Parametric & Polar co-ordinates ,Evaluation of double integrals,Evaluation of triple integrals.
5. Vector calculus studies various differential operators defined on scalar or vector fields, which are typically expressed in terms of the Del operator (∇), also known as "nabla". The five most important differential operations in vector calculus are: (a) Grad (b) Div (c) Curl (d) Vector Laplacian (e) Laplacian. , Green's theorem is mostly used to solve two-dimensional flow integrals, stating that the sum of fluid outflows at any point inside a volume is equal to the total outflow summed about an enclosing area. In plane geometry, and in particular, area surveying.
6. Green's theorem can be used to determine the area and centroid of plane figures solely by integrating over the perimeter. In vector calculus, the divergence theorem, also known as Gauss's theorem or Ostrogradsky's theorem, is a result that relates the flow (that is, flux) of a vector field through a surface to the behavior of the vector field inside the surface.

UNIT I:

Differential Calculus: Rolle's Theorem – Lagrange's Mean Value Theorem – Cauchy's mean value Theorem – Generalized Mean Value theorem. **Differentiability of multivariable functions**: Jacobian - Functional dependence - Maxima and Minima of functions of two variables with constraints and without constraints (Lagrange's method of multipliers).

UNIT II:

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.

UNIT III:

Solution of Non- linear Systems, Special Functions: Introduction, Solution of Algebraic and Transcendental Equations, The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method.Beta and Gamma Functions: Relation between them, their properties – evaluation of improper integrals using Gamma / Beta functions

UNIT IV:

Multiple Integrals: Multiple integrals - double and triple integrals – change of variables – change of order of integration – Finding Surface areas, volumes.

UNIT V:

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 (Without proof). Verification of Green's - Stoke's and Gauss's Theorems.

TEXT BOOKS:

1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Numerical Methods using MATLAB by John H Matthews, Kurt D Fink, Pearson Education
4. Numerical Methods, Jain, SRK Iyyengar Narosa Publications

REFERENCE BOOKS:

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

Course Outcomes:

1. Understands the geometrical interpretation of Rolle's, Lagrange's, Cauchy Mean value theorems,
2. Understands the Taylors theorem, Understands applications of Taylor theorem in complex analysis, Understands the geometrical interpretation of all the forms of remainders, Understands the maximum and minimum concept with and without constraints.
3. Learns about the solution of transcendental equations, Understands geometrical meaning of the solution of the curves.
4. Student learn about the interpolation process, He can find the interpolating polynomial function for the given data. Student understands how to find the unknown values of y wrt x values
5. Learn about vector and scalar fields, Grad, div and Curl and their applications and properties,
6. Study about Solenoidal and irrotational vectiors with scalar potential function. Vector integration like - Line integral, Surface and Volume integrals and their Evaluations. Study about Integral Theorems Like –Green's , Gauss's and Stokes's theorem's and their verifications

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

MATHEMATICS – III

Course Objectives:

1. Understands the applications of z-transforms
2. Find the Fourier series representation of the Periodic functions
3. Find the Fourier series representation for the functions in an arbitrary interval
4. Find the applications of numerical differentiation in evaluating engineering problems.
5. For the given data the student can fit the respective curves

UNIT I:

Fourier series & Transforms: 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.

Fourier Transforms: Fourier integral theorem - Fourier sine and cosine integrals. Fourier transforms – Fourier sine and cosine transforms – properties – inverse transforms – Finite Fourier transforms.

UNIT II:

Z-Transforms :Z-Transforms Inverse Z-Transform properties, damping rule, shifting rule, Initial and final value theorems, convolution theorem solution of difference equation by Z-Transforms

UNIT III:

Curve Fitting, Numerical Differentiation & Integration: Curve fitting: Fitting a first degree (linear) and second degree (parabola), exponential, power curves for a data by the Method of least squares.

Numerical Differentiation & Integration: Trapezoidal Rule, Simpson's $1/3^{rd}$, 3/8 Rule, Gaussian Integration, Evaluation of principal value integrals, Generalized Quadrature.

UNIT IV:

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 V:

Partial differential equations & Applications: Formation of partial differential equations by eliminating arbitrary constants or arbitrary functions, Solutions of first order linear (Lagrange) equation, Solution of nonlinear first order equations (four standard types), Solution using separation of variables, Application to heat equation (one dimension), wave equation (one dimension).

TEXT BOOKS:

1. Mathematical Methods of Science and Engineering by Kanti B.Datta ,Cengage Learning
2. Higher Engineering Mathematics by B.S. Grewal, Khanna Publishers.
3. Numerical Methods using MATLAB by John H Matthews, Kurt D Fink, Pearson Education
4. Numerical Methods, Jain, SRK Iyyengar Narosa Publications

REFERENCE BOOKS:

1. Advanced engineering Mathematics by Kreyszig, John Wiley & Sons Publishers.
2. Advanced Engineering Mathematics by R.K. Jain & S.R.K. Iyengar, 3rd edition, Narosa Publishing House, Delhi.
3. Engineering Mathematics – I by T.K. V. Iyengar, B. Krishna Gandhi & Others, S. Chand.
4. Engineering Mathematics – I by D. S. Chandrasekhar, Prison Books Pvt. Ltd.
5. Engineering Mathematics – I by G. Shanker Rao & Others I.K. International Publications.
6. Advanced Engineering Mathematics with MATLAB, Dean G. Duffy, 3rd Edi, CRC Press Taylor & Francis Group.
7. Mathematics for Engineers and Scientists, Alan Jeffrey, 6ht Edi, 2013, Chapman & Hall/ CRC
8. Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Pearson Education.

Course Outcomes:

1. This best-fitting curve can be obtained by the method of least squares.
2. Applications of Fourier transforms in engineering problems.
3. PDEs can be used to describe a wide variety of phenomena such as sound, heat, electrostatics, electrodynamics, fluid flow, elasticity, or quantum mechanics.

2014-2015 **Code: 40503**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

DATA STRUCTURES AND SOFTWARE TOOLS
(Common to EEE/ECE/CSE)

Course Objectives:

1. Develop skills to use and analyze simple linear and nonlinear data Structures
2. Strengthen the ability to identify and apply the suitable data structure for the given real world problem
3. Derive and express time and space complexities.
4. Understand the maintenance of data using XML and related technologies.
5. Learn Java development tools.
6. Develop skills in debugging a program.

UNIT I:

Stacks: Basic stack operations, Representation of a stack using arrays, Stack Applications: Reversing list, factorial calculation, infix-to-postfix transformation, postfix expression evaluation

Queues: Basic queue operations, Representation of a queue using array, Classification and implementation – Circular and Dequeues, Applications of Queues.

UNIT II:

Linear lists: Introduction, linked lists, single linked list, representation of a linked list in memory, operations on a single linked list, advantages and disadvantages of single linked list. Stacks and Queues representation using Single linked list

UNIT III:

Algorithm specification, Time and Space complexities using Asymptotic notations

Searching: Basic concepts, linear search, binary search, Fibonacci search

Sorting techniques: Basic concepts, Bubble sort, Selection sort, Insertion sort, Merge sort, Quick sort and their implementation programs

UNIT IV:

Introduction to XML and Related Technologies: Issues in information exchange, What is XML? XML basics, Document type definitions (DTDs), Working with DTDs, XML namespaces, Generating XML schemas, XML schemas-XPath, XSL transformation, simple XSL transforms.

Java Development Tools: The JDT environment, Creating and running a program, Automating testing with JUnit, Using Ant and javadoc.

UNIT V:

Debugging Applications: Using the debugger, Starting the debugger, Setting breakpoints, Stepping through the code, Inspecting variables and expressions, Hot code replace.

Introduction to Integrated Development Environment – Eclipse

Introduction, Terms and Concepts, Architecture - Platform Architecture, Plug-in Architecture. Finding, installing and updating plug-ins, Some popular plug-ins, Eclipse Case Studies.

Eclipse Web Tools Platform: Web Tools Platform (WTP 1.0) Project, Web Standard Tools, J2EE Standard Tools, The Data Tools Project, The AJAX Tools Framework.

TEXT BOOKS:

1. Data Structures using C by Reema Thareja – Second Edition, Oxford University Press.
2. Data Structures: A Pseudocode Approach with C by R.F.Gilberg and B.A.Forouzan - Second Edition, Cengage Learning.
3. Beginning XML, Joe Fawcett, Danny Ayers, Liam R. E. QuinJoe Fawcett, Danny Ayers, Liam R. E. Quin, Wrox Press. 2012.
4. Eclipse: Programming Java Applications , Steve Holzner, O'Reilley, 2004.

REFERENCE BOOKS:

1. C& Data structures by P. Padmanabham - Third Edition, B.S. Publications.
2. Data Structures using C by A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein – Seventh Edition, Pearson Education
3. C Programming & Data Structures by E. Balagurusamy - TMH.
4. C& Data structures by E V Prasad and N B Venkateswarlu - S. Chand & Co.

Course Outcomes:

At the end of the course, students able to:

1. Use and analyze different data structures
2. Identity the appropriate data structure for given problem
3. Analyzes the programs for time and space complexities
4. Create XML documents and related transformations.
5. Create and execute sample Java programs.
6. Debug and inspect variables in a program
7. Capable of creating projects in IDE Environment such as Eclipse.
8. Capable of creating Web based project and AJAX framework.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

ENGINEERING CHEMISTRY LAB
(Common to CE/EEE/ME/ECE/CSE/Mining)

Experiments:
***Any 10 of the following:**

Titrimetry:
1. Estimation of ferrous iron by dichrometry.
2. Estimation of hardness of water by EDTA method.

Mineral analysis:
3. Estimation of manganese dioxide in pyrolusite.

Instrumental Methods:

Colorimetry:
4. Determination of ferrous iron in cement by colorimetric method

Conductometry:
5. Conductometric titration of strong acid vs strong base.
6. Conductometric titration of mixture of acids vs strong base.

Potentiometry:
7. Titration of strong acd vs strong base by potentiometry.
8. Titration of weak acid vs strong base by potentiometry.

Physical properties:
9.Determination of viscosity of sample oil by redwood / oswald's viscometer.
10.Determination of Surface tension of lubricants.

Preparations:
11. Preparation of Aspirin

Kinetics:
12. To determine the Rate constant of hydrolysis of methyl acetate by an acid.

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 Harrmendra Goel, Ane Books Private Ltd.,
2. A text book on experiments and calculation Engg. S.S. Dara.
3. Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

DATA STRUCTURES AND SOFTWARE TOOLS LAB
(Common to EEE/ECE/CSE)

Course Objectives:

1. To develop skills to design and analyze simple linear and nonlinear data Structures
2. To strengthen the ability to identify and apply the suitable data structure for the given real world problem
3. To gain knowledge in practical applications of data structures

Week 1:
Write C programs that implement stack (its operations) using i) Arrays ii) Pointers

Week 2:
Write a C program that uses Stack operations to convert infix expression into postfix expression

Week 3:
Write a C program that uses Stack operations to evaluate the postfix expression

Week 4:
Write C programs that implement Linear Queue (its operations) using i) Arrays ii) Pointers

Week5:
Write C program that implement Circular Queue (its operations) using arrays

Week 6:
Write C program that implement Double-ended Queue (its operations) using arrays

Week 7:
Write a C program that uses functions to perform the following operations on single linked list.
i) Insertion ii) Deletion iii) Traversal

Week 8:
Write a C program to implement stack using single linked list.

Week 9:
Write a C program to implement queue using single linked list.

Week 10:
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 iii) Fib Search

Week 11:
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 iii) Insertion sort

Week 12:
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
i) Quick sort ii) Merge sort

Week 13:
Write an XML file to maintain student details such as Roll No, Student Name ,Email id and there mobile Number
Write a Schema(XSD) for Book details

(Hint: Book Name, Author Name, Publications, Price and Attributes accordingly)

Week 14:
a) Installation of Eclipse with required plug-ins.
b) Write a sample java program to accept a Number to check whether it is prime Number or not .
c)

TEXT BOOKS:

1. C Programming by D.Ravi Chandran
2. Data structures using Aaron M. Tenenbaum, Yedidyah Langsam, Moshe J.Augestien Pearson Education
3. C & Data structures, P.Padmanabham, BS Publications
4. C and Data Structures, Ashok N.Kamthane, Pearson Edition.
5. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.

Course Outcomes:

Upon completion of the course, the students are expected to:

1. Be able to design and analyze the time and space efficiency of the data structure
2. Be capable to identity the appropriate data structure for given problem
3. Have practical knowledge on the application of data structures
4. Have acquainted with different software tools.

2014-2015 **Code: 40E03**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech EEE – II Sem

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

ENGLISH LANGUAGE COMMUNICATION SKILLS LAB
(Common to CE/EEE/ME/ECE/CSE/Mining)

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.

Course Objectives:

To sensitize the students to the intelligibility in their pronunciation of English, speech sounds, word accent, intonation and rhythm
To improve the fluency in spoken English and neutralize mother tongue influence
To facilitate honing of listening and speaking skills of students
To train students to understand nuances of both verbal and non verbal communication during all activities
To develop confidence to face the audience and participate in activities
To help the students shed inhibitions and communicate with clarity

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 they can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, awareness regarding 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
• Just A Minute(JAM) Sessions.

Syllabus:

English Language Communication Skills Lab shall have two parts:
a. Computer Assisted Language Learning (CALL) Lab
b. Interactive Communication Skills (ICS) Lab

UNIT I:

CALL Lab: Introduction to Phonetics – Speech Sounds – Vowels and Consonants
ICS Lab: Ice-Breaking activity and JAM session
Listening: listening for sounds in context, for ideas.
Speaking: ideation and translation of ideas into sentences.

UNIT II:

CALL Lab: Structure of Syllables - Past Tense Marker and Plural Marker – Weak Forms and Strong Forms -Consonant Clusters.
ICS Lab: Situational Dialogues – Role-Play- Expressions in Various Situations – Self-introduction and Introducing others – Greetings – Apologies – Requests – Social and Professional Etiquette - Telephone Etiquette.
Listening: listening for specific purposes, for details.
Speaking: speaking in the above situations with clarity, connectivity, maintaining voice characters.

UNIT III:

CALL Lab: Word accent and Listening Comprehension-reading(aloud) meaningfully.
ICS Lab: Descriptions- Narrations- Giving Directions and guidelines.
Listening: listening for intelligible English

Speaking: formal and informal conversations, register.

UNIT IV:
CALL Lab: Intonation and Common errors in Pronunciation- reading aloud(evaluating through recording).
ICS Lab: Extempore- Public Speaking , Oral Presentation Skills
Listening: note taking and listening for speaker's tone/attitude
Speaking: organizing , connecting ideas and sentences, short forms in spoken English, errors in spoken English

UNIT V:
CALL Lab: Neutralization of Mother Tongue Influence and Conversation Practice
ICS Lab: Information Transfer, Debate

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

2. Interactive Communication Skills (ICS) Lab :
The Interactive Communication Skills Lab: A Spacious room with movable chairs and audio-visual aids with a Public Address System, a T. V., a digital stereo –audio & video system and camcorder etc.
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):
Prescribed Lab Manual: English Language Communication Skills laboratory Manual Published by Pearson, New Delhi 2012

Course Outcomes:
1. Better Understanding of nuances of language through audio- visual experience and group activities
2. Neutralization of accent for intelligibility
3. Speaking with clarity and confidence thereby enhancing employability skills of the students
4. Good understanding of listening skills and speaking skills and their application in real life situations.
5. Good understanding of non-verbal communication and developing confidence to face audience, shed inhibitions.

REFERENCE BOOKS:

1. Polyskills by Cambridge Foundation Course
2. Technical Communication by William Sanborn Pfeiffer and TVS Padmaja
3. English Language Communication, a Reader Cum Lab Manual Course Content and Practice by Dr. A Ramakrishna Rao, Dr. G. Natanam, Prof. S.A. Sankaranarayanan
4. A Course On English by K.R. Lakshminarayanan
5. Successful Presentations by John Hughes and Andrew Mallett
6. Oxford Word Skills, learn and Practise English Vocabulary by Ruth Gairns and Redman
7. Public Speaking Techniques, Speak Like a Winner by Akash Karia
8. The Art of Public Speaking by Stephen Lucas
9. Essential Communication Skills by Shalini Aggarwal, Linda Chapman
10. English Language Communication Skills, Lab Manual cum Workbook by Cengage Learning.

2014-15 **CODE: 40M04**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

MATHEMATICS – IV

Learning Objectives: To learn

1. Transforming the given variable coefficient equation (Cauchy's and Lagrange's) into the one with
2. constant coefficients.
3. Identifying ordinary points, singular points and regular singular points for the given ODE.
4. Finding the series solution around a regular singular point.
5. Solve the given ODE with variable coefficients by Frobenius method and test the convergence of its
6. series solution.
7. Series solutions for Legendre and Bessel differential equations, analyzing the properties of Legendre
8. and Bessel polynomials.
9. Differentiation and Integration of complex valued functions.
10. Evaluation of integrals using Cahchy's integral formula.
11. Taylor's series, Maclaurin's series and Laurent's series expansions of complex functions
12. Evaluation of integrals using residue theorem.
13. Transform a given function from z - plane to w – plane.
14. Identify the transformations like translation, magnification, rotation and reflection and inversion.
15. Properties of bilinear transformations.

Syllabus

UNIT – I:
Linear ODE with variable coefficients and series solutions(second order only):
Equations reducible to constant coefficients-Cauchy's and Lagrange's differential equations.
Motivation for series solutions, Ordinary point and Regular singular point of a differential equation , Transformation of non-zero singular point to zero
Singular point. Series solutions to differential equations around zero, Frobenius Method about zero.

Unit-II
Special Functions : Legendre's Differential equation, General solution of Legendre's equation, Legendre polynomials Properties: Rodrigue's formula – Recurrence relations, Generating function of Legendre's polynomials – Orthogonality. Bessel's Differential equation, Bessel functions properties: – Recurrence relations,
Orthogonality, Generating function , Trigonometric expansions involving Bessel functions.

UNIT-III:
Complex Functions –Differentiation and Integration :
Complex functions and its representation on Argand plane, Concepts of limit Continuity, Differentiability, Analyticity, Cauchy-Riemann conditions, Harmonic functions– Milne – Thompson method. Line integral – Evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula.

UNIT-IV:
Power series expansions of complex functions and contour Integration:
Radius of convergence -Expansion in Taylor's series, Maclaurin's series and Laurent series. Singular point –Isolated singular point – pole of order m – essential singularity. Residue – Evaluation of residue by formula and by Laurent series – Residue theorem. Evaluation of integrals of the type
(a) Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$
(b) $\int_{c}^{c+2\pi} f(cos\theta, \sin\theta)d\theta$

UNIT-V:
Conformal mapping: Transformation of z-plane to w-plane by a function, Conformal transformation. Standard transformations- Translation; Magnification and rotation; inversion and reflection,Transformations like e^z, log z, z2, and Bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given .

TEXT BOOKS:
1. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
2. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.
3. Complex Variables & Applications by JW Brown & R V Churchil

REFERENCES:

1) Complex Variables Principles And Problem Sessions By A.K.Kapoor, World Scientific Publishers
2) Engineering Mathematics-3 By T.K.V.Iyengar andB.Krishna Gandhi Etc
3) A Text Book Of Engineering Mathematics By N P Bali, Manesh Goyal
4) Mathematics for Engineers and Scientists, Alan Jeffrey, 6th Edit. 2013, Chapman & Hall/CRC
5) Advanced Engineering Mathematics, Michael Greenberg, Second Edition. Person Education
6) Mathematics For Engineers By K.B.Datta And M.A S.Srinivas,Cengage Publication.

2014-15 **CODE:40339**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

FLUID MECHANICS AND HYDRAULIC MACHINERY

Pre-requisite: Engineering Physics

Objective: The objective of this subject is to provide the basic knowledge of fluids behavior at different conditions and their applications.

Outcome: The student shall be able to apply the knowledge to access the performance of hydraulic machines.

Codes/Tables: Nil

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.

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

UNIT II

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.

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: pilot tube, venturimeter, and orifice meter, Flow nozzle, Turbine flow meter.

UNIT III

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 don and efficiency, flow over radial vanes.

Hydroelectric 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 IV

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.

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 V

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

Reciprocating Pumps : Working, Discharge, slip, indicator diagrams.

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 Durgaiah, New Age International.
3. Hydraulic Machines by Banga & Sharma, Khanna Publishers.
4. Instrumentation for Engineering Measurements by James W. Dally, William E. Riley ,JohnWiley & Sons Inc. 2004 (Chapter 12 - Fluid Flow Measurements.

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

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

ELECTRONIC DEVICES AND CIRCUITS

Objective: In real-time applications the most commonly used electronic devices are TV, radio, cell phone and etc. So to have a clear idea on semiconductor characteristics like diodes, transistors (FETs, BJTs and etc) the subject syllabus is framed accordingly to furnish full and clear knowledge on these basics.

UNIT - I

CATHODE RAY OSCILLOSCOPE: Motion of a charged particle in electric and magnetic fields, simple problems involving electric and magnetic fields only, electrostatic and magneto static deflection sensitivities, constituents of cathode ray oscilloscope, cathode ray tube, the electron gun, focusing, deflection system, uses of cathode ray oscilloscope.

REVIEW OF TRANSPORT PHENOMENA IN SEMICONDUCTORS: Electrons and holes in an Intrinsic semiconductor, conductivity of a semiconductor, carrier concentrations in an intrinsic semiconductor, donor and acceptor impurities, charge densities in a semiconductor, Fermi level in a semiconductor having impurities, diffusion, carrier lifetime, the continuity equation, the hall effect.

UNIT - II

SEMICONDUCTOR DIODE CHARACTERISTICS: Qualitative theory of the p-n Junction, the p-n junction as a diode, band structure of an open circuited p-n junction, the current components in a p-n diode, quantitative theory of the p-n diode currents, the volt ampere characteristics, the temperature dependence of V-I characteristics, diode resistance, ideal versus practical diodes, diode equivalent circuits, space charge or transition capacitance C_T, diffusion capacitance, breakdown mechanism in diode, Zener diode**,** V-I characteristics of Zener diode.

UNIT - III

DIODE APPLICATIONS: Introduction, load line analysis, series diode configurations, parallel and series-parallel configuration, half-wave rectification, full-wave rectification, general filter considerations, Inductive, Capacitive, LC and CLC filters, Zener diode as voltage regulator.

SPECIAL SEMICONDUCTOR DEVICES: Principle of operation, Characteristics and applications of Tunnel diode, Varactor diode, UJT, Photo Diode, LED, LCD, SCR.

UNIT - IV

BIPOLAR JUNCTION TRANSISTORS: Introduction, transistor construction, transistor operation, transistor current components, transistor as an amplifier, common base configuration, common emitter configuration, common collector configuration, limits of operation, transistor specifications.

FIELD EFFECT TRANSISTORS: Junction Field Effect Transistor (JFET) - Principle of operation, volt ampere characteristics, advantages of JFET over BJT. Introduction to MOSFETs - depletion and enhancement type MOSFETs, operation and volt-ampere characteristics.

UNIT - V

BJT BIASING: Need for biasing, Operating point, load line analysis, bias stabilization techniques: fixed bias, collector to base bias, self-bias, Stabilization against variations in I_{co}, V_{BE} and □ for the self bias circuit, bias compensation techniques, thermal runaway and thermal stability.

FET BIASING: Biasing techniques: Fixed bias, Source self-bias, Voltage divider bias.

TEXT BOOKS:

1. Jacob Milliman, Christos C .Halkias, Satyabrata Jit (2011), *Electronic Devices and Circuits*, 3rd edition, Tata McGraw Hill, New Delhi.
2. S. Shalivahanan, N. Suresh Kumar, A. Vallavaraj (2007), *Electronic Devices and Circuits*, 3rd edition, McGraw Hill, New Delhi, India
3. Robert Boylestad, Lowis Nashelsky (1993), *Electronic Devices and Circuit Theory*, 5th edition, Prentice Hall of India, New Delhi, India.

REFERENCE BOOKS:

1. David. A. Bell (1986), *Electronic Devices and Circuits*, 4th edition, Prentice Hall of India, New Delhi.
2. G. K. Mittal (1999), *Electronic Devices and Circuits*, 22nd edition, Khanna Publications, New Delhi
3. Theodore. F. Bogart Jr, Jeffrey S. Beasley, Guillermo Rico (2004), *Electronic Devices and Circuits*, 6th edition Pearson Education, India.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL CIRCUITS

Objective: To start with understanding of any circuit the important and primary elements in electrical are R , L and C .So this subject has the scope of knowing better of basics of electrical elements, magnetic elements and their circuitry and also network topology and its theorems for reducing the complexity of the circuit.

UNIT –I:

Introduction to Electrical Circuits:

Circuit Concept, R-L-C Parameters, Voltage and Current Sources, Independent and Dependent Sources, Source Transformation, Voltage – Current relationship for Passive Elements (for different input signals –Square, Ramp, Saw tooth and Triangular). Kirchhoff's Laws, Network Reduction Techniques – Series, Parallel, Series Parallel, Star –to-Delta or Delta-to-Star Transformations, Nodal Analysis, Mesh Analysis, Super node and Super mesh for DC Excitations.

UNIT –II:

Single Phase A.C. Circuits

R.M.S. and Average values and form factor for different periodic wave forms, Steady State Analysis of R, L and C (in Series, Parallel and Series Parallel Combinations) with Sinusoidal Excitation, Concept of Reactance, Impedance, Susceptance and Admittance, Phase and Phase difference, Concept of Power Factor, Real and Reactive powers, J-notation, Complex and Polar forms of representation, Complex power.

Resonance: Resonance – Series, Parallel Circuits, Concept of Band width and Q factor.

UNIT –III:

Magnetic Circuits:

Magnetic Circuits, Faraday's law of Electromagnetic Induction, Concept of Self and Mutual Inductance, Dot convention, Coefficient of Coupling, Composite Magnetic Circuit, Analysis of Series and Parallel Magnetic Circuits.

UNIT –IV:

Network Topology:

Definitions, Graph, Tree, Basic cutset and Basic Tie set Matrices for Planar Networks, Loop and Nodal methods for analysis of Networks with Dependent & Independent Voltage and Current Sources, Duality & Dual Networks.

UNIT –V:

Network Theorems (With A.C. & D.C):

Tellegen's, Superposition, Reciprocity, Thevinin's, Norton's, Maximum Power Transfer, Milliman's and Compensation theorems for D.C excitations.

TEXT BOOKS:

1. Electric Circuits - A.Chakrabarhty, Dhanipat Rai & Sons.
2. Network analysis - N.C Jagan and C. Lakhminarayana, BS publications.
3. Basic circuit analysis by d.r. Cunningham & j.a. stuller, jaico

REFERENCE BOOKS:

1. Engineering Circuit Analysis - William Hayt ,Jack E. Kemmerly, S M Durbin, Mc Graw Hill Companies.
2. Electric Circuit Analysis - K.S.Suresh Kumar, Pearson Education.
3. Electrical Circuits - David A.Bell, Oxford University Press.
4. Network Analysis and Circuits - M.Arshad, Infinity Science Press.
5. Circuits - A.Bruce Carlson, Cengage Learning.
6. Electrical Circuits: An Introduction - KCA Smith & RE Alley, Cambridge University Press.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTROMAGNETIC FIELDS

Objective: To expose the students to a variety of basic laws which drive all the electrical and electronics devices. The two categories of fields are studied in this subject i.e. electro static and dynamic, magneto static, dynamic or time varying with their mathematical formulations.

UNIT – I: Electrostatics:

Sources and effects of electromagnetic fields – Vector fields – Different co-ordinate systems

– Divergence theorem –Stoke's theorem. Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential– Properties of potential function – Potential gradient – Guass's law – Application of Guass's Law – Maxwell's first law. Laplace's and Poison's equations – Solution of Laplace's equation in one variable.

UNIT – II: Conductors, Dielectric & Capacitance :

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

Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions, Capacitance – Capacitance of parallel plate and spherical and co-axial capacitors with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of continuity.

UNIT – III: Magneto Statics, Ampere's circuital law:

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. 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, Field due to a circular, rectangular and square loops.

UNIT –IV: Force in Magnetic fields, Magnetic Potential:

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

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

UNIT – V: Inductance, Time Varying Fields :

Self and Mutual inductance – Neumans'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.

Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation – 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 - *William H. Hayt & John. A. Buck* Mc. Graw-Hill Companies, 7th Editon, 2012.
2. Electromagnetic Fields - *Sadiku*, Oxford Publications, 7th edition, 2006.

REFERENCE BOOKS:

1. Introduction to Electro Dynamics - *D J Griffiths*, Prentice-Hall of India Pvt. Ltd, 2nd editon, 1989.
2. Electromagnetic - *J P Tewari*, Khanna Publishers, 2nd edition, 2005.
3. Electromagnetics - *J. D Kraus*, Mc Graw-Hill Inc, 4thedition 1992.
4. Electromagnetic fields - *S. Kamakshaiah*, Right Publishers, 2007.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL MACHINES-I

Objective: Every Engineer will work on an electrical machine either in domestic or in industry. So, the basic idea of electro mechanical energy conversion and the two types of machines like DC motors and DC generators and its principle of operation, construction, types and etc are studied.

UNIT – I: ELECTROMECHANICAL ENERGY CONVERSION

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

UNIT – II: D.C. GENERATORS – CONSTRUCTION & OPERATION

D.C. Generators – Principle of operation – Action of commutator – constructional features – classification of DC generators – separately excited and self excited generators – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – E. M.F Equation – Problems – Armature reaction – cross magnetizing and demagnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation.

UNIT –III: TYPES OF D.C GENERATORS & LOAD CHARACTERISTICS :

Methods of Excitation – separately excited and self excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self excite and remedial measures. Load characteristics of shunt, series and compound generators – parallel operation of D.C series generators – use of equalizer bar and cross connection of field windings – load sharing.

UNIT – IV: 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 – 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 – V: 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.

TEXT BOOKS:

1. Electric Machinery- *P.S. Bimbra*, Khanna Publishers, 7th edition, 2010,
2. Theory and performance of Electrical machines – *J.B Gupta*, S.K Kataria & Sons publishers, 2009.

REFERENCE BOOKS:

1. Electrical Machines – *S.K. Bhatta Charya*, Tata Mc. Hill Publications, 2007.
2. Electrical Machines - *I.J. Nagrath & Kothari*, Tata Mc Graw-Hill Publishers, 3rd edition, 2004.
3. Electric Machines – *M.V. Deeshpande*, Wheeler Publishing, 1997.
4. Electrical machinery - *A.E. Fritzgerald C. Kingsley and S. Umans*, Mc Graw-Hill Companies, 5th edition, 2010.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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 (Color Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards, PCB's
2. Identification, Specifications and Testing of Active Devices, Diodes, BJT's, Low power JFET's, MOSFET's, Power Transistors, LED's, LCD's, SCR, UJT.
3. Study and operation of
   i. Multimeters (Analog and Digital)
   ii. Function Generator
   iii. Regulated Power Supplies
   iv. CRO.

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

1. Forward & Reverse Bias Characteristics of PN Junction Diode.
2. Zener diode characteristics and Zener as voltage Regulator.
3. Input & Output Characteristics of Transistor in CB Configuration and h-parameter calculations.
4. Input & Output Characteristics of Transistor in CE Configuration and h-parameter calculations.
5. Half Wave Rectifier with & without filters.
6. Full Wave Rectifier with & without filters.
7. FET characteristics.
8. Design of Self-bias circuit.
9. Frequency Response of CC Amplifier.
10. Frequency Response of CE Amplifier.
11. Frequency Response of Common Source FET amplifier .
12. SCR characteristics.
13. UJT Characteristics

PART C:Equipment required for Laboratories:

1. Regulated Power supplies (RPS) -0-30 V
2. CRO's -0-20 MHz.
3. Function Generators -0-1 MHz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Ammeters (Analog or Digital) -0-20 µA, 0-50µA, 0-100µA, 0-200µA, 0-10 mA.
8. Voltmeters (Analog or Digital) -0-50V, 0-100V, 0-250V
9. Electronic Components -Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs, FETs, LEDs,MOSFETs, Diodes- Ge &Sitype, Transistors – NPN, PNP type

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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.
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 II :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 III :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 IV :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.
Capital and Capital Budgeting:Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

Unit V: Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).
Financial Analysis through ratios: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, 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.

REFERENCE BOOKS*:*

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

POWER SYSTEMS-I

Objective: To expose knowledge on electrical power generating types and it's functioning with their advantages & disadvantages and also general aspects of distribution systems and tariff methods, transmission line categories and their calculations of the parameters. This subject is mainly having applications in electrical and also civil.

UNIT-I: Thermal and Nuclear Power Stations

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, numerical problems.

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.

UNIT- II: Gas Power Stations, Substations and Gas Insulated Substations (GIS).

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

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,single line diagram of gas insulated substations, bus bar, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations

UNIT- III: General Aspects of Distribution Systems and DC and AC 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.

D.C. Distribution Systems: Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

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

UNIT- IV: Economic Aspects of Power Generation and Tariff Methods

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

UNIT-V: 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 course in power systems - *J.B. Gupta,* S. K. Kataria & Sons, 2009.
2. Principles of Power Systems - *V.K Mehta and Rohit Mehta,* S.Chand& Company Ltd., New Delhi 2004.
3. Generation, distribution and utilization of Electrical energy- *C.L.Wadhawa*, New age International (P) Limited, Publishers 1997.

REFERENCE BOOKS:

1. A Text Book on Power System Engineering - *M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti*, Dhanpat Rai & Co. Pvt. Ltd., 1999.
2. Elements of Power Station design and practice - *M.V. Deshpande*, PHI, 2010.
3. Electrical Power Generation, Transmission and Distribution - *S.N.Singh*., PHI 2003.
4. Gas turbine performance- *PP Wals, P.Fletcher*, Blackwell Publisher, 2004

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRONIC CIRCUITS

Objective: The scope of the subject is to have an idea on types of amplifiers like small signal and large signal with their types and circuitry, feedback amplifiers and oscillators which are mainly used in various applications for gain improving. To know the advantages of pulse and digital in applications the linear, nonlinear and multivibrators are also discussed.

UNIT - I

SMALL SIGNAL SINGLE STAGE AMPLIFIERS: Transistor as an amplifier, Classification of amplifiers, Transistor hybrid model, the h-parameters, analysis of a transistor amplifier circuit (CE, CB, CC) using h-parameters, simplified Common Emitter hybrid model, frequency response of amplifier. Small signal JFET model, common source amplifier, common drain amplifier, common gate amplifier.

UNIT - II

LARGE SIGNAL AMPLIFIERS: Introduction, class A large signal amplifier, harmonic distortion, transformer coupled audio power amplifier, collector dissipation and conversion efficiency, push-pull amplifier, class B power amplifier, class B push pull amplifier without output transformer, push pull amplifiers using transistors having complementary symmetry, class AB push pull amplifier, thermal stability, heat sink.

UNIT - III

FEEDBACK AMPLIFIERS: Feedback concept and types, transfer gain with feedback, general characteristics of negative feedback amplifiers, effect of negative feedback on input and output resistances, method of analysis of feedback amplifiers, voltage series, current series, current shunt, and voltage shunt feedback amplifiers.

OSCILLATORS: Constituents of an oscillator, Barkhausen criterion, classification of oscillators, sine wave feedback oscillators of LC type-general form of oscillator circuit, Hartley oscillator, Colpitts oscillator, sine wave feedback oscillator of RC type- RC phase shift oscillator, Wein bridge oscillator, Crystal oscillator, frequency stability.

UNIT - IV

LINEAR WAVE SHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and exponential inputs, high pass RC circuit as differentiator and low pass RC circuit as integrator circuit.

NON-LINEAR WAVE SHAPING: Diode clippers, transistor clippers, clipping at two independent levels, clamping operation, clamping circuits using diode with different inputs, clamping circuit theorem, practical clamping circuits.

UNIT - V

MULTIVIBRATORS: The stable state of a Bistable multivibrator, design and analysis of fixed bias and self biased Bistable multivibrator, Schmitt trigger circuit using transistors, Monostable multivibrator, design and analysis of collector coupled and emitter coupled Monostable multivibrator, Astable multivibrator, design and analysis of collector coupled and emitter coupled Astable multivibrator.

TEXT BOOKS:

1. Jacob Milliman, Christos C. Halkias, Chetan D. Parikh (2011), Integrated Electronics-Analog and Digital Circuits and Systems, 2nd edition, Tata McGraw Hill Education Private Limited, New Delhi.
2. Jacob Millman, Herbert Taub, Mothiki S. Prakash Rao (2008), Pulse, Digital and Switching Waveforms, 3rd edition, Tata McGraw Hill, New Delhi.

REFERENCE BOOKS:

1. Robert L. Boylestad, Louis Nashelsky (2006), Electronic Devices and Circuits Theory, 9th edition, Pearson/Prentice Hall, India.
2. Jacob Millman, Arvin Grabel (2003), Microelectronics, 2nd edition, Tata McGraw Hill, New Delhi.
3. A. Anand Kumar (2005), Pulse and Digital Circuits, Prentice Hall of India, India.
4. G. K. Mithall (1998), Electronic Devices and Circuits, Khanna Publishers, New Delhi.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

II Year B.Tech EEE-II Sem

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

SWITCHIG THEORY AND LOGIC DESIGN

Objective: To expose the students to a variety of number systems and it switching functions, design and minimization of sequential and combinational circuits with different applications. This data creates an interest in engineer for developing their own logic circuitry for their application.

UNIT -I:

Number System and Boolean Algebra And Switching Functions:

Number Systems, Base Conversion Methods, Complements of Numbers, Codes- Binary Codes, Binary Coded Decimal Code and its Properties, Unit Distance Codes, Alpha Numeric Codes, Error Detecting and Correcting Codes.

Boolean Algebra: Basic Theorems and Properties, Switching Functions, Canonical and Standard Form, Algebraic Simplification of Digital Logic Gates, Properties of XOR Gates, Universal Gates, Multilevel NAND/NOR realizations.

UNIT -II:

Minimization and Design of Combinational Circuits:

Introduction, The Minimization with theorem, The Karnaugh Map Method, Five and Six Variable Maps, Prime and Essential Implications, Don't Care Map Entries, Using the Maps for Simplifying, Tabular Method, Partially Specified Expressions, Multi-output Minimization, Minimization and Combinational Design, Arithmetic Circuits, Comparator, Multiplexers, Code Converters, Wired Logic, Tristate Bus System, Practical Aspects related to Combinational Logic Design, Hazards and Hazard Free Relations.

UNIT -III:

Sequential Machines Fundamentals:

Introduction, Basic Architectural Distinctions between Combinational and Sequential circuits, The Binary Cell, Fundamentals of Sequential Machine Operation, The Flip-Flop, The D-Latch Flip-Flop, The "Clocked T" Flip-Flop, The " Clocked J-K" Flip-Flop, Design of a Clocked Flip-Flop, Conversion from one type of Flip-Flop to another, Timing and Triggering Consideration, Clock Skew.

UNIT -IV:

Sequential Circuit Design and Analysis:

Introduction, State Diagram, Analysis of Synchronous Sequential Circuits, Approaches to the Design of Synchronous Sequential Finite State Machines, Design Aspects, State Reduction, Design Steps, Realization using Flip-Flops

Counters - Design of Single mode Counter, Ripple Counter, Ring Counter, Shift Register, Shift Register Sequences, Ring Counter Using Shift Register.

UNIT -V:

Sequential Circuits:

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

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

TEXT BOOKS:

1. Switching and Finite Automata Theory- Zvi Kohavi & Niraj K. Jha, 3rd Edition, Cambridge.
2. Digital Design- Morris Mano, PHI, 3rd Edition.

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

NETWORK THEORY

Objective: To highlight the difference between circuit and network and its analysis with DC and AC source. To make the engineer to use the mathematical functions for designing a network and testing with different filters for improving the efficiency.

UNIT-I Three phase circuits

Three phase circuits: Phase sequence- Star and delta connection-Relation between line and phase voltages and currents in balanced and unbalanced systems

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

UNIT-II Transient Analysis

D.C Transient Analysis : Transient response of R-L, R-C, R-L-C series, parallel circuits for D.C excitation-Initial conditions-solution using differential equation and Laplace transforms

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

UNIT III **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 zeros 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 domain response from pole - zero plot.

UNIT-IV Two Port Networks
Two port network parameters – Z, Y, ABCD ,hybrid and inverse hybrid parameters and their relations (Both Dependent and independent Sources).

Condition of Reciprocity and Symmetry
Cascaded networks Concept of transformed network – two port network parameters using transformed variables - Problems

UNIT V Filters

Low Pass, High Pass, Band Pass, Band Elimination – Numerical Problems

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.Engineering Circuit Analysis by William Hayt and Jack E.Kemmerley,Mc Graw Hill Company,6 th 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.Chakarborthy, Dhanpath Rai & Co-6th edition-2010.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL MACHINES-II

Objective: To expose the students to a variety of static devices like transformers and its performance with different tests for both single-phase and three –phase. This subject also explains the different types of induction motors and its domestic and industrial applications.

To help the students cultivate the habit of practicing mathematics, thus providing them with the required facility to face any competitive exam.

UNIT-I : Single phase transformers :

Types - constructional details- minimization of hysteresis and eddy current losses-emf equation - operation on no load and on load - phasor diagrams.

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

Performance of transformers : 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 II: Three phase Transformers

Poly-phase connections - Y/Y, Y/ , / Y, /Δ Δ and Δ Δ, Third harmonics in phase voltages-three winding transformers-tertiary windings. Determination of Zp, Zs and Zt transients in switching - off load and on load tap changing; Scott connection.

UNIT III: Three Phase Induction Motors

Construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation – Slip- rotor emf and rotor frequency - rotor reactance, rotor current and pf. at standstill and during operation.

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 IV: **Performance of Three Phase Induction Motors**

Circle diagram-no load and blocked rotor tests-predetermination of performance. Methods of starting , starting current and torque calculation of Induction Motors.

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

UNIT V: Single Phase Induction Motors:

Single phase Induction motor – Constructional features- Double revolving field theory Equivalent circuit- spilt –Phase motors- Capacitor start Capacitor run motors.

TEXT BOOKS:

1. Electric Machinery- *P.S. Bimbra*, Khanna Publishers, 7th edition, 2010.
2. Theory and Performance of Electrical Machines - *JB Gupta*, SK Kataria & lSons,2009.

REFERENCE BOOKS:

1. Performance and Design of AC Machines - *MG.Say*, BPB Publishers, 1968.
2. Theory of Alternating Current Machinery- *Langsdorf*, Tata McGraw-Hill Companies, 2nd edition, 2001.
3. Electromechanics-II (transformers and induction motors) - *S. Kamakashaiah*, Hitech publishers.
4. Electric Machines – *I.J.Nagrath & D.P.Kothari*,Tata Mc Graw Hill, 7th Edition, 2005.
5. Electrical machinery - *A.E. Fritzgerald C. Kingsley and S. Umans*, Mc Graw-Hill Companies, 5th edition, 2010

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

II Year B.Tech EEE-II Sem

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

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

LINEAR AND DIGITAL IC APPLICATIONS

Objective: To expose the students to a basic Integrated circuit and its origin and its linear, non-linear applications. This subject scope is the extension of the basics studied earlier (STLD, EC and etc). It also includes the most commonly used active filters, timers, PLLs, voltage regulator, A/D and D/A converters in every application.

UNIT - I

INTEGRATED CIRCUITS AND OPERATIONAL AMPLIFIER: Introduction, Classification of IC's, IC chip size and circuit complexity, basic information of Op-Amp IC741 Op-Amp and its features, the ideal Operational amplifier, Op-Amp internal circuit, Op-Amp characteristics - DC and AC.

UNIT - II

LINEAR APPLICATIONS OF OP-AMP: Inverting and non-inverting amplifiers, adder, subtractor, Instrumentation amplifier, AC amplifier, V to I and I to V converters, Integrator and differentiator.

NON-LINEAR APPLICATIONS OF OP-AMP: Sample and Hold circuit, Log and Antilog amplifier, multiplier and divider, Comparators, Schmitt trigger, Multivibrators, Triangular and Square waveform generators, Oscillators.

UNIT - III

ACTIVE FILTERS: Introduction, Butterworth filters – 1st order, 2nd order low pass and high pass filters, band pass, band reject and allpass filters.

TIMER AND PHASE LOCKED LOOPS: Introduction to IC 555 timer, description of functional diagram, monostable and astable operations and applications, schmitt trigger, PLL - introduction, basic principle, phase detector/comparator, voltage controlled oscillator (IC 566), low pass filter, monolithic PLL and applications of PLL.

UNIT - IV

VOLTAGE REGULATOR: Introduction, Series Op-Amp regulator, IC Voltage Regulators, IC 723 general purpose regulators, Switching Regulator.

D to A AND A to D CONVERTERS: Introduction, basic DAC techniques - weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, A to D converters - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC, DAC and ADC Specifications.

UNIT - V

CMOS LOGIC: CMOS logic levels, MOS transistors, Basic CMOS Inverter, NAND and NOR gates, CMOS AND-OR-INVERT and OR-AND-INVERT gates, implementation of any function using cmos logic.

COMBINATIONAL CIRCUITS USING TTL *74XX* ICS: Study of logic gates using *74XX* ICs, Four-bit parallel adder(IC 7483), Comparator(IC 7485), Decoder(IC 74138, IC 74154), BCD-to-7-segment decoder(IC 7447), Encoder(IC 74147), Multiplexer(IC 74151), Demultiplexer (IC 74154).

SEQUNTIAL CIRCUITS USING TTL *74XX* ICS: Flip Flops (IC 7474, IC 7473), Shift Registers, Universal Shift Register(IC 74194), 4- bit asynchronous binary counter(IC 7493).

TEXT BOOKS:

1. D. Roy Choudhury, Shail B. Jain (2012), *Linear Integrated Circuit*, 4th edition, New Age International Pvt. Ltd., New Delhi, India.

2. Ramakant A. Gayakwad, (2012), *OP-AMP and Linear Integrated Circuits*, 4th edition, Prentice Hall / Pearson Education, New Delhi.
3. Floyd, Jain (2009), *Digital Fundamentals*, 8th edition, Pearson Education, New Delhi.

REFERENCE BOOKS:

1. Sergio Franco (1997), *Design with operational amplifiers and analog integrated circuits*, McGraw Hill, New Delhi.
2. Gray, Meyer (1995), *Analysis and Design of Analog Integrated Circuits*, Wiley International, New Delhi.
3. John F. Wakerly (2007), *Digital Design Principles and practices*, Prentice Hall / Pearson Education, New Delhi.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL AND ELECTRONICS INSTRUMENTATION

Objective: To expose students about measuring instruments like voltage, power, energy, current , resistance , inductance and capacitance . Instrument calibration and its extension of range

UNIT-I BASICS OF MEASUREMENT SYSTEM

Introduction: Measurement & Measurement system , Units of Electrical Quantities , Concept of Average, Root Mean Square etc., dB Scale , Methods of Measurements, Measurement Standards, Classification of instruments. Measurement Errors and Instrument Characteristics: Error, Types of Errors, Significant Figures, Static and Dynamic Characteristics of Measuring Instruments.

UNIT-II MEASURING INSTRUMENTS

Electromechanical Instruments: Permanent Magnet Moving Coil (PMMC), Galvanometer, DC Volt and Ammeter, Rectifier Volt and Ammeter , Series and Shunt Ohm Meter, VOM , Electro-dynamic Instrument, Electro dynamic Voltmeter and Ammeter.

Electronics Meters: Analog Electronics VOM, DC and AC Voltmeter circuits using active electronics components like transistor, FET, OPAMP, Electronics Ohm meter, Electronics Ammeter etc.

Digital Instruments, Display concepts, Analog to digital conversion principle, Digital voltmeter, types, construction, working, Digital Multi-meter, Digital frequency meter, Time measurement, frequency ratio measurement.

UNIT-III INSTRUMENT TRANSFORMERS & MEASUREMENT OF POWER, ENERGY

Instrument Transformer: Instrument Transformers, Types, Requirements, Difference between Current Transformer (CT) and Potential Transformer (PT) , Construction, Burden, Error, Causes of error, reduction of error , Testing of Instrument Transformer , Effect of Secondary Open Circuit in CT, Permanent magnetization/ demagnetization of cores in CT. LVDT and its principle of operation

Measurement of Power and Energy:

Power and Energy concept, Power in DC and AC Circuits ,Electro-dynamic and ferro-dynamic watt meter, low power factor wattmeter, thermo couple watt meter , Power measurement in 3-phase systems , Energy measurement, motor meters, Induction type meters, 1-phase and 3-phase energy measurement, Errors, Compensation for light load, over load, voltage, temperature etc.

UNIT-IV BRIDGES

Bridge Circuits:

DC Bridge Circuits, Measurement of Medium Resistance, Measurement of Low Resistance, Measurement of High Resistance.(Wheatston'ss, Kelvin's Double Bridge)

AC Bridge Circuits, Bridge Balancing , Equivalent circuits of Capacitance and Dissipation Factor, Equivalent Circuit of L and Q Factor, Capacitance Measurement(De-Sauty's , Schering) Inductance Measurement(Anderson, Maxwell's Bridge) , Frequency measurement, Digital LCR meters.

UNIT-V INSTRUMENT CALIBRATION

Instrument Calibration and Extension of Range: Comparison methods, Digital Multimeter, Precision DC Voltage source, Potentiometer, calibration of various analog measurement instruments, Extension of range of instruments, Accessories for Measuring Instruments: Probes, Test leads, shielded cables, connectors, use of probes, low capacitance probes, High voltage probes, RF demodulator probes, probes for ICs, Current probes.

TEXT BOOKS:

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

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

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

POWER SYSTEMS-II

Objective: To expose the students to types of transmission lines and its propagation and its power system transients and various factors governing the performance of transmission lines. In this subject the comparison between underground and overhead transmission with their constructional features are also discussed.

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-I Performance of Short, Medium and Long Length Transmission Lines

Short, medium and long line and their model representations - Nominal-T, Nominal- π 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.

Performance of Long Transmission Lines

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

UNIT – III Power System Transients

Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems). Bewley‘s Lattice Diagrams (for all the cases mentioned with numerical examples).

UNIT-IV 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 Voltage regulation of the Transmission Line, Series and Shunt Compensation. Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

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-V 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.

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.
3.Power system Analysis-by John J Grainger William D Stevenson TMC Companies, 4th edition,1982.

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

CONTROL SYSTEMS

Objective: To expose the students to basic definitions of control systems and mathematical modeling of an application in open and closed loop and its transient analysis either in time or frequency domain with stability methods. In this subject the idea of state space analysis for an application is explained and this is useful for fast computer computation.

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

Transfer Function Representation: Block diagram representation of systems considering electrical and mechanical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using Mason's gain formula.

UNIT -II:

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

UNIT –III:
Stability Analysis in S-Domain:
The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability.

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

UNIT –IV:
Frequency Response Analysis:
Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and Phase margin and Gain margin-Stability Analysis from Bode Plots. Polar Plots-Nyquist Plots-StabilityAnalysis.Compensation techniques – Lag, Lead and Lead -Lag Controllers design in frequency Domain, P, I,D, PI, PD and PID Controllers.

UNIT –V:
State Space Analysis of Continuous Systems:
Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization-Solving the Time invariant state Equations- State Transition Matrix and it's Properties – Concepts of Controllability and Observability.

TEXT BOOKS:

1. Control System engineering by Nagrath and Gopal New Age International (P) Limited, Publishers.
2. Control Systems - N.C.Jagan, BS Publications.
3. Automatic control systems by B. C.Kuo

REFERENCE BOOKS:

1. Control systems - A.Ananad Kumar, PHI.
2. Control Systems Engineering - S.Palani, Tata-McGraw-Hill.
3. Control systems - Dhanesh N.Manik, Cengage Learning.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

POWER ELECTRONICS

Objective: To expose the students with types of power semiconductor devices with their characteristics, different conversion devices and circuits like AC-AC, DC-DC, DC-AC, and AC-AC converters and its principle of operation and mathematical modeling.

UNIT – I POWER SEMI CONDUCTOR DEVICES

Thyristors – Silicon Controlled Rectifiers (SCR's) – Bipolar Junction Transistor (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).

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 – II 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

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 – III 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 – IV 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 – V CHOPPERS & INVERTERS

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

Inverters - Single phase inverters – Classification-Basic series inverter and basic parallel inverters, – single-phase half and full-bridge inverters with R and RL Loads, Three phase with 120 and 180 degrees phase angle – Waveforms.

TEXT BOOKS :

1. Power Electronics – by M. D. Singh & K. B. Kanchandhani, Tata Mc Graw – Hill Publishing company, 1998.
2. Power Electronics - by P.S. Bimbra

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL MACHINES-III

Objective: To expose the students with types of AC machines like induction and synchronous machines (motors and generators) and its principle of operation and constructional details with their power diagrams. This subject also gives an awareness of different special machines used and their applications.

UNIT – I Construction and Principle of operation of Synchronous Generator

Constructional Features of wound 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.

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-V Power Diagrams

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

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 Ptiman & 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.

Electromachanics-III (Synchronous and single phase machines), S.Kamakashiah, Right Publishers-3rd edition-2008.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech EEE-I Sem

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

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 Xd and Xq 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:

9. Parallel operation of Single phase Transformers
10. Separation of core losses of a single phase transformer
11. Brake test on three phase Induction Motor
12. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
13. Efficiency of a three-phase alternator
14. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
15. Measurement of sequence impedance of a three-phase alternator.
16. Performance characteristics of a Schrage motor

2014-15 **CODE: 40215**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech EEE-I Sem

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

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:-

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

REFERENCE BOOKS:

1. 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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

MANAGEMENT SCIENCE

UNIT - I

Introduction to Management: Concepts of Management and organization-nature, importance and Functions of Management, Taylor‘s Scientific Management Theory, Fayol‘s Principles of Management, Mayo‘s Hawthorne Experiments, Maslow‘s Theory of Human Needs, Douglas McGregor‘s Theory X and Theory Y, Herzberg‘s Two-Factor Theory of Motivation, Systems Approach to Management, Leadership Styles, Social responsibilities of Management.

UNIT - II

Designing Organizational Structures : Basic concepts related to Organization - Departmentation and Decentralization, Types of mechanistic and organic structures of organization (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organization, Cellular Organization, team structure, boundary less 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: chart, R chart, c chart, p chart, (simple Problems), Acceptance Sampling,
Deming‘s contribution to quality.

a) **Materials Management:** Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.
b) **Marketing**: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

UNIT- IV

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.

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

UNIT – V

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

Contemporary Management Practices : Basic concepts of MIS, End User Computing, Materials Requirement Planning (MRP), Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Supply Chain Management, Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

TEXT BOOKS:

1. Aryasri : *Management Science*, TMH, 2004.
2. Stoner, Freeman, Gilbert, *Management*, 6th Ed, Pearson Education, New Delhi, 2004.

REFERENCE BOOKS*:*

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2005
3. Thomas N.Duening & John M.Ivancevich Management — Principles and Guidelines, Biztantra,2003.
4. Kanishka Bedi, *Production and Operations Management*, Oxford University Press, 2004.
5. Memoria & S.V.Gauker, *Personnel Management*, Himalaya, 25/e, 2005
6. Samuel C.Certo: *Modern Management*, 9/e, PHI, 2005
7. Schermerhorn, Capling, Poole & Wiesner: *Management*, Wiley, 2002.
8. Parnell: Strategic Management, Biztantra,2003.
9. Lawrence R Jauch, R.Gupta &William F.Glueck: Business Policy and Strategic Management, Frank Bros.2005.
10. L.S.Srinath: PERT/CPM,Affiliated East-West Press, 2005.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

STATIC DRIVES

Objective: To expose the students from the basic idea of electric drives and its characteristics with different loads, control of DC & AC motors with different methods.

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.

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 II: 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 –III: 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.

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-IV: 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 – Introduction to CSI and VSI – Comparison of VSI and CSI operations – Speed torque characteristics – numerical problems on induction motor drives

UNIT –V: 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

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. Modern Power Electronics and AC Drives by B.K.Bose, PHI-2002.

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech EEE-II Sem

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

COMPUTER METHODS IN POWER SYSTEMS

Objective: To expose the students with applications of matrices in power systems which makes the easy computing in power flow studies, short circuit analysis, power system steady state and transient analysis.

UNIT -I Power System Network Matrices-1

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

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 –II Power flow Studies

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.

Newton Raphson Method in Rectangular and Polar Co-Ordinates Form: Load Flow Solution with or without PV Busses-Derivation of Jacobian Elements, Algorithm and Flowchart.

Decoupled and Fast Decoupled Methods.- Comparison of Different Methods – DC load Flow

UNIT – III Short Circuit Analysis

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.

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 –IV 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 –V 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. Wadhwa

4. Power System Analysis by Grainger and Stevenson, Tata McGraw Hill-2nd edition, reprint 2004.

REFERENCE BOOKS:

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

2014-15 **CODE: 40433**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

MICROPROCESSORS AND MICROCONTROLLERS

Objective: To expose the students with basics of microprocessors and controllers, their types, pin diagram and other features. The utilization of MPMC by writing Assembly Language Programming for real-time applications by making programming easy than using C programming or etc.

UNIT -I:

8086 Architecture: 8086 Architecture-Functional diagram, Register Organization, Memory Segmentation, Programming Model, Memory addresses, Physical Memory Organization, Architecture of 8086, Signal descriptions of 8086- Common Function Signals, Timing diagrams, Interrupts of 8086.

UNIT -II:

Instruction Set and Assembly Language Programming of 8086: Instruction formats, Addressing modes, Instruction Set, Assembler Directives, Macros, Simple Programs involving Logical, Branch and Call Instructions, Sorting, Evaluating Arithmetic Expressions, String Manipulations.

UNIT -III:

I/O Interface: 8255 PPI, Various Modes of Operation and Interfacing to 8086, Interfacing Keyboard, Display, D/A and A/D Converter.

Communication Interface: Serial Communication Standards, Serial Data Transfer Schemes, 8251 USART Architecture and Interfacing.

Interfacing with advanced devices: Memory Interfacing to 8086, Interrupt Structure of 8086, Vector Interrupt Table, Interrupt Service Routine.

UNIT -IV:

Introduction to Microcontrollers: Overview of 8051 Microcontroller, Architecture, I/O Ports, Memory Organization, Addressing Modes and Instruction set of 8051, Simple Programs

UNIT -V:

8051 Real Time Control: Programming Timer Interrupts, Programming External Hardware Interrupts, Programming the Serial Communication Interrupts, Programming 8051 Timers and Counters

TEXT BOOKS:

1. D. V. Hall, Microprocessors and Interfacing, TMGH, 2nd Edition 2006.
2. Kenneth. J. Ayala, The 8051 Microcontroller , 3rd Ed., Cengage Learning.

REFERENCE BOOKS:

1. Advanced Microprocessors and Peripherals – A. K. Ray and K.M. Bhurchandani, TMH, 2nd Edition 2006.
2. The 8051Microcontrollers, Architecture and Programming and Applications -K.Uma Rao, Andhe Pallavi, Pearson, 2009.
3. Micro Computer System 8086/8088 Family Architecture, Programming and Design - Liu and GA Gibson, PHI, 2nd Ed.
4. Microcontrollers and Application - Ajay. V. Deshmukh, TMGH, 2005.
5. The 8085 Microprocessor: Architecture, programming and Interfacing – K.Uday Kumar, B.S.Umashankar, 2008, Pearson

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ENVIRONMENTAL STUDIES

Course Objectives

- An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences including geosystems, biology, chemistry, economics, political science and international processes.
- The ability to work effectively as a member of an interdisciplinary team on complex problems involving multiple competing stakeholders and agendas.
- The ability to apply quantitative reasoning skills to environmental problems including basic calculations related to energy, water, and air issues and the use of statistical methods in data analysis and argumentation.

UNIT-I

ECOSYSTEMS: Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classification of ecosystems, 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 alternate energy sources – case studies. Land resources: land as a resource, land degradation, man induced landslides and land use / land cover mapping.
BIODIVERSITY AND BIOTIC RESOURCES: Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and intrinsic values. Hot spots of biodiversity. Threats to biodiversity: habitat 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-III

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 (CETP).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-IV

GLOBAL ENVIRONMENTAL PROBLEMS AND GLOBAL EFFORTS : Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, climate 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 Montréal Protocol,

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) AND ENVIRONMENTAL MANAGEMENT PLAN: Definition of Impact: classification of impacts, Positive and Negative, methods of baseline data acquisition. Impacts on different environmental components. 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-V

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 .

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).

Course Outcomes

- To enable the students to realise the importance of the sustainable use of natural resources
- To make the students aware of the impacts of human actions on environment and measures to minimize and mitigate them
- To enable the students to become aware of the current issues and problems pertaining to the environment

TEXT BOOKS:

1. Environmental studies , From crisis to cure by R.Rajagopalan, 2005
2. Environmental studies by Erach Bharucha 2005, University Grants Commission, University Press.

REFERENCE BOOKS:

1. Text book of Environmental Science and Technology by M.Anji Reddy 2007
2. Environmental Science: towards a sustainable future by Richard T.Wright. 2008 PHL Learning Private Ltd. New Delhi
3. Environmental Engineering and science by Gilbert M.Masters and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech EEE-II Sem

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

RENEWABLE ENERGY SOURCES
(OPEN ELECTIVE)

Objective: To expose the students with two types of sources like renewable and non-renewable sources and their differences, how renewable sources are used and their environmental impacts. The subject enlights renewable sources which are the future and evergreen sources.

UNIT I: PRINCIPLES OF SOLAR RADIATION:

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

UNIT II: SOLAR ENERGY COLLECTION:

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

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

UNIT III: WIND ENERGYAND BIO-MASS:

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

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

UNIT IV: GEOTHERMAL ENERGY:

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

OCEAN ENERGY:

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

UNIT V: DIRECT ENERGY CONVERSION:

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

TEXT BOOKS:

1. Renewable Energy Resources â€— 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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

III Year B.Tech EEE-II Sem

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

INTELLECTUAL PROPERTY RIGHTS
(OPEN ELECTIVE)

Objective:

1. To make students familiar with Intellectual Property Rights.
2. To understand innovations in engineering and other domains.
3. To be familiar with patents, copyrights and various acts related to innovations.

UNIT I

Introduction – Invention and Creativity – Intellectual Property (IP) – Importance – Protection of IPR – Basic types of property i. Movable Property ii. Immovable Property and iii. Intellectual Property.

UNIT II

IP – Patents – Copyrights and related rights – Trade Marks and rights arising from Trademark registration – Definitions – Industrial Designs and Integrated circuits – Protection of Geographical Indications at national and International levels – Application Procedures..

UNIT III

International convention relating to Intellectual Property – Establishment of WIPO – Mission and Activities – History – General Agreement on Trade and Tariff (GATT).

UNIT IV

Indian Position Vs WTO and Strategies – Indian IPR legislations – commitments to WTO-Patent Ordinance and the Bill – Draft of a national Intellectual Property Policy – Present against unfair competition.

UNIT V

Case Studies on – Patents (Basumati rice, turmeric, Neem, etc.) – Copyright and related rights – Trade Marks – Industrial design and Integrated circuits – Geographic indications – Protection against unfair competition.

TEXT BOOKS

1. Subbaram N.R. “Handbook of Indian Patent Law and Practice “, S. Viswanathan Printers and Publishers Pvt. Ltd., 1998.

REFERENCES

1. P. Narayanan; Law of Copyright and Industrial Designs; Eastern law House, Delhi, 2010
2. Prabhuddha Ganguli: ‘ Intellectual Property Rights” Tata Mc-Graw –Hill, New Delhi
3. M.Ashok Kumar and Mohd.Iqbal Ali: “Intellectual Property Right” Serials Pub.

2014-15 **CODE: 40B04**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

HUMAN VALUES & PROFESSIONAL ETHICS

Course Objectives

1. To make students familiar with Human value with professional ethics.
2. To understand values which can enhance human well-being of the society
3. To be trustworthy and honest with more professional responsibilities

UNIT-I

HUMAN VALUES
Morals, Values and Ethics – Integrity – Work Ethic – Service Learning – Civic Virtue – Respect for Others – Living Peacefully – caring – Sharing – Honesty – Courage – Time management-Valuing Time – Cooperation – Commitment – Empathy – Self-Confidence – Character. Corporate Social responsibility, Social responsibility as a citizen of this great country.

UNIT-II

SELF MANAGEMENT,
SELF Concept Learning Enhancement Facilitation Centre, University of Weston Sydney, Australia. A New
Idea of Self Constructs, Self discipline, understanding self, Self Exploration, need and purpose. Assessment procedures and types, importance of Self assessment/appraisal systems. Gardeners multiple intelligence concept. Key to success and road map to success. Untrained/Trained Memory.

UNIT-III
ENGINEERING ETHICS
Code of ethics for engineers, ASCE, ASME Codes of ethical conduct of engineers, Personal ethics, Professional ethics, Senses of 'Engineering Ethics' - variety of moral issued - types of inquiry – moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory –uses of ethical theories– Models of Professional Roles - theories about right action - Self-interest - customs and religion professional rights - employee rights - Intellectual Property Rights (IPR), Trade marks, Patents, copy rights. Some interesting case studies.

UNIT-IV
VALUE EDUCATION
Concept of Value education, its intensions, the need for value education in today's context, basic guidelines for value education, the contents of value education and the process of value education. Universal Brotherhood, spirituality, Basic human aspirations, harmony: self, family and society.

UNIT-V
STRESS MANAGEMENT
Types of Stress, Positive Stress (Eustress) and rewarding experiences, Negative Stress (Distress) and its influence on human health, Methods of Stress Management for better living. Meditation, Laughter is the best medicine, Anger management. Personality development. Study & Learning skills, need to develop a positive attitudes, brain & behaviour, respect for authority, responsibility, accountability, confidentiality etc..

Course Outcomes:

Upon completion of the course, the students are expected to:

1. To define various terms related to Human value with professional ethics..
2. To understand the professional responsibilities.
3. To analyse the soft ware engineering ethics and practices..

TEXTBOOK

1. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi,
2. S.B.Gogate,"Human Values & Professional Ethics",Vikas Publishing House Pvt., Ltd., First edition-2011

REFERENCES

1. Charles D. Fleddermann, “Engineering Ethics”, Pearson Education / Prentice Hall,
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, “Engineering Ethics – Concepts and Cases”,
3. Wadsworth Thompson Learning, United States, 2000 (Indian Reprint now available) 2003.
4. C.G.Krishnadas Nair, “Engineering Ethics”, Harishree Publishing Company, Bangalore.
   R.K.Shukla, Anuranjan Mishra,”Human Values and Professional Ethics” Published by A.B.Publication.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

ELECTRICAL AND ELECTRONICS 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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

14. PSPICE simulation of single-phase full converter using RLE loads and single-phase AC voltage controller using RLE loads
15. PSPICE simulation of resonant pulse commutation circuit and Buck chopper.
16. PSPICE simulation of single phase Inverter with PWM control.

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. Spice for power electronics and electric power by Rashid, CRC Press

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

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
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.

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

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

UNIT – III System 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.
Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholtz relay Protection.
Protection of Lines: Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay.
Protection of Bus bars – Differential protection.

UNIT – IV Protection against over voltages
Grounded and Ungrounded Neutral Systems- Effects of Ungrounded Neutral on system performance. Methods of Neutral Grounding: Solid, Resistance, Reactance - Arcing Grounds and Grounding Practices.

UNIT – V Over voltages in Power Systems
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
3.The Transmission and Distribution of Electricalenergy- H.Cotton and Barber, ELBS

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
4	-/-/-	4

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.

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

UNIT – III ILLUMINATION

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

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

UNIT – IV ELECTRIC TRACTION – I

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

UNIT – V ELECTRIC TRACTION-II

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

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem **L T/P/D C**
4 -/-/- 4

DIGITAL SIGNAL PROCESSING

Objectives:

This course is an essential course that provides design techniques for processing all type of signals in various fields. The main objectives are:

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

UNIT -I:

Introduction: Introduction to Digital Signal Processing: Discrete Time Signals & Sequences, Linear Shift Invariant Systems, Stability, and Causality, Linear Constant Coefficient Difference Equations, Frequency Domain Representation of Discrete Time Signals and Systems

Realization of Digital Filters: Applications of Z – Transforms, Solution of Difference Equations of Digital Filters, System Function, Stability Criterion, Frequency Response of Stable Systems, Realization of Digital Filters – Direct, Canonic, Cascade and Parallel Forms.

UNIT -II:

Discrete Fourier series & Discrete Fourier Tranform: DFS Representation of Periodic Sequences, Properties of Discrete Fourier Series, Discrete Fourier Transforms: Properties of DFT, Linear Convolution of Sequences using DFT, Computation of DFT: Over-Lap Add Method, Over-Lap Save Method, Relation between DTFT, DFS, DFT and Z-Transform.

Fast Fourier Transforms: Fast Fourier Transforms (FFT) - Radix-2 Decimation-in-Time and Decimation-in-Frequency FFT Algorithms, Inverse FFT, and FFT with General Radix-N.

UNIT-III:

IIR Digital Filters: Analog filter approximations – Butterworth and Chebyshev, Design of IIR Digital Filters from Analog Filters, Step and Impulse Invariant Techniques, Bilinear Transformation Method, Spectral Transformations.

UNIT-IV:

FIR Digital Filters: Characteristics of FIR Digital Filters, Frequency Response, Design of FIR Filters: Fourier Method, Digital Filters using Window Techniques, Frequency Sampling Technique, Comparison of IIR & FIR filters.

UNIT-V:

Multirate Digital Signal Processing: Introduction, Down Sampling, Decimation, Upsampling, Interpolation, Sampling Rate Conversion.

Finite Word Length Effects: Limit cycles, Overflow Oscillations, Round-off Noise in IIR Digital Filters, Computational Output Round Off Noise, Methods to Prevent Overflow, Trade Off Between Round Off and Overflow Noise, Dead Band Effects.

TEXT BOOKS:

1. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G. Manolakis, Pearson Education / PHI, 2007.
2. Discrete Time Signal Processing – A. V. Oppenheim and R.W. Schaffer, PHI, 2009
3. Fundamentals of Digital Signal Processing – Loney Ludeman, John Wiley, 2009

REFERENCE BOOKS:

1. Digital Signal Processing – Fundamentals and Applications – Li Tan, Elsevier, 2008
2. Fundamentals of Digital Signal Processing using MATLAB – Robert J. Schilling, Sandra L. Harris, Thomson, 2007
3. Digital Signal Processing – S.Salivahanan, A.Vallavaraj and C.Gnanapriya, TMH, 2009
4. Discrete Systems and Digital Signal Processing with MATLAB – Taan S. EIAli, CRC press, 2009.
5. *Digital Signal Processing - A Practical approach, Emmanuel C. Ifeachor and* Barrie W. Jervis, 2nd Edition, Pearson Education, 2009.
6. Digital Signal Processing - Nagoor Khani, TMG, 2012

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

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

UNIT – II Hydrothermal Scheduling &Optimal Power Flow Solution
Optimal scheduling of Hydrothermal System: Hydroelectric power plant models, Scheduling problems-Short term Hydrothermal scheduling problem.

Optimal power flow solution L: Elementarytreatmentof OPF without and with inequality constraints

UNIT – III Load Frequency Control – I
Necessity of keeping frequency constant.

Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case.
Proportional plus Integral control of single area and its block diagram representation, steady state response – Load Frequency Control and Economic dispatch control.

UNIT – IV Load Frequency Control - II
Load frequency control of 2-area system – uncontrolled case and controlled case, tie-line bias control

Optimal two area LF control – steady state representation – performance index and optimal parameter adjustment.

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

3. Reactive power control in electric systems – T.J.E. Miller, John wiley & sons

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

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

UNIT II BREAK DOWN IN GASEOUS, LIQUID AND SOLID DIELECTRICS

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

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

UNIT III GENERATION AND MEASUREMENT O F HIGH VOLTAGES AND CURRENTS

Generation of High Direct Current Voltages, Generation of High alternating voltages, Generation of Impulse Voltages, Generation of Impulse currents, Tripping and control of impulse generators.

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

UNIT IV 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 V NON-DISTRUCTIVE TESTING OF MATERIAL AND ELECTRICAL APPARATUS & HIGH VOLTAGE TESTING

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

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem **L T/P/D C**
4 -/-/- 4

VLSI DESIGN
(Elective – I)

Objective ;
This subject deals with the detailed introduction to IC technology and its electrical properties, VLSI design processes, gate level design. Information about data path subsystems. In addition the Programmable Logic Devices and CMOS testing are also discussed.

UNIT –I:

Introduction: Introduction to IC Technology – MOS, PMOS, NMOS, CMOS & BiCMOS

Basic Electrical Properties: Basic Electrical Properties of MOS and BiCMOS Circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold Voltage, g_m, g_{ds}, Figure of merit ωo; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT -II:

VLSI Circuit Design Processes: VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2 μm CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits.

UNIT –III:

Gate Level Design: Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Time delays, Driving large capacitive loads, Wiring capacitance, Fan – in, Fan – out, Choice of layers.

UNIT -IV:

Data Path Subsystems: Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters.

Array Subsystems: SRAM, DRAM, ROM, Serial Access Memories.

UNIT -V:

Programmable Logic Devices: PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach, Parameters influencing low power design.

CMOS Testing: CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chip level Test Techniques.

TEXT BOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition
2. CMOS VLSI Design – A Circuits and Systems Perspective, Neil H. E Weste, David Harris, Ayan Banerjee, 3rd Ed, Pearson, 2009.
3. VLSI Design – M. Michael Vai, 2001, CRC Press.

REFERENCE BOOKS:

1. Introduction to VLSI Systems: A Logic, Circuit and System Perspective – Ming-BO Lin, CRC Press, 2011
2. CMOS logic circuit Design - John .P. Uyemura, Springer, 2007.
3. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
4. VLSI Design- K .Lal Kishore, V. S. V. Prabhakar, I.K International, 2009.
5. Introduction to VLSI – Mead & Convey, BS Publications, 2010.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

DIGITAL CONTROL SYSTEMS
(Elective-I)

Objective ;

This subject deals with the detailed introduction to sampling and reconstruction, transform analysis of sampled data systems with time domain analysis. In addition the transform of digital control and state space analysis are also discussed.

UNIT – I SAMPLING AND RECONSTRUCTION

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

UNIT-II Transform analysis of Sampled Data Systems

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

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 – III Time domain analysis

Comparison of Time response of continuous data and sampled data systems, correlation between time response and rootlocus in splance and Zplane, Effect of Pole zero configuaration on the Zplance upon maximum overshot and peak time of transient response – root locus of digital control systems – steady state error analysis of DCS , Nyquist plot, Bode plot, gain margin and phase margin for digital control systems

UNIT – IV Transform Design of Digital Controls:

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.State Observers – Full order and Reduced order observers.
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 –V 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
Concepts of Controllability and Observability, Tests for controllability and Observability. Controllability and Observability conditions for Pulse Transfer Function

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

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE-I Sem **L T/P/D C**
4 -/- / - 4

DATA STRUCTURES
(Elective-I)

Course Objectives:

1. To understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data structures.
2. To understand the notations used to analyze the Performance of algorithms.
3. To understand the behavior of data structures such as stacks, queues, trees, hash tables, search trees,Graphs and their representations.
4. To choose the appropriate data structure for a specified application.
5. To understand and analyze various searching and sorting algorithms.
6. To write programs in C to solve problems using data structures such as arrays, linked lists, stacks,queues, trees, graphs, hash tables, search trees.

UNIT- I

Basic concepts- Algorithm Specification-Introduction, Recursive algorithms, Data Abstraction Performance analysis-time complexity and space complexity, Asymptotic Notation-Big O, Omega and Theta notations, Introduction to Linear and Non Linear data structures

Linked lists: Singly Linked Lists-Operations-Insertion, Deletion, Concatenating singly linked lists, Circularly linked lists- Operations for Circularly linked lists, Doubly Linked Lists- Operations- Insertion, Deletion. Representation of single, two dimensional arrays, sparse matrices-array and linked representations.

UNIT- II

Stacks: Stack ADT, definition, operations, array and linked implementations in C, Applications-infix to postfix conversion, Postfix expression evaluation, recursion implementation.

Queue ADT, definition and operations ,array and linked Implementations in C, Circular queues-Insertion and deletion operations, Deque (Double ended queue)ADT,array and linked implementations in C.

UNIT- III

Trees – Terminology, Representation of Trees, Binary tree ADT, Properties of Binary Trees, Binary Tree Representations-array and linked representations, Binary Tree traversals, Threaded binary trees, Max PriorityQueue ADT-implementation-Max Heap-Definition, Insertion into a Max Heap, Deletion from a Max Heap.

Graphs – Introduction, Definition, Terminology, Graph ADT, Graph Representations- Adjacency matrix,Adjacency lists, Graph traversals- DFS and BFS.

UNIT- IV

Searching- Linear Search, Binary Search, Static Hashing-Introduction, hash tables, hash functions, Overflow Handling.

Sorting-Insertion Sort, Selection Sort, Radix Sort, Quick sort, Heap Sort, Comparison of Sorting methods.

UNIT- V

Search Trees-Binary Search Trees, Definition, Operations- Searching, Insertion and Deletion, AVL Trees- Definition and Examples, Insertion into an AVL Tree ,B-Trees, Definition, B-Tree of order m, operations-Insertion and Searching, Introduction to Red-Black and Splay Trees (Elementary treatment-only Definitions and Examples), Comparison of Search Trees.

Pattern matching algorithm- The Knuth-Morris-Pratt algorithm, Tries (examples only).

Course Outcomes:

1. Learn how to use data structure concepts for realistic problems.
2. Ability to identify appropriate data structure for solving computing problems in respective language.
3. Ability to solve problems independently and think critically.

TEXT BOOKS:

1. Fundamentals of Data structures in C, 2nd Edition, E.Horowitz, S.Sahni and Susan Anderson-Freed, Universities Press.
2. Data structures A Programming Approach with C, D.S.Kushwaha and A.K.Misra, PHI.

REFERENCE BOOKS:

1. Data structures: A Pseudocode Approach with C, 2nd edition, R.F.Gilberg And B.A.Forouzan, Cengage Learning.
2. Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.

3. Data Structures using C, A.M.Tanenbaum,Y. Langsam, M.J.Augenstein, Pearson.
4. Data structures and Program Design in C, 2nd edition, R.Kruse, C.L.Tondo and B.Leung,Pearson.
5. Data Structures and Algorithms made easy in JAVA, 2nd Edition, Narsimha Karumanchi, CareerMonk Publications.
6. Data Structures using C, R.Thareja, Oxford University Press.
7. Data Structures, S.Lipscutz,Schaum's Outlines, TMH.
8. Data structures using C, A.K.Sharma, 2nd edition, Pearson..
9. Data Structures using C &C++, R.Shukla, Wiley India.
10. Classic Data Structures, D.Samanta, 2nd edition, PHI.
11. Advanced Data structures, Peter Brass, Cambridge.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

OPTIMIZATION TECHNIQUES
(ELECTIVE-II)

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.

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

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

UNIT – II: Classical Optimization Techniques/Introduction to NLPP: 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: 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. Wolfs and Beal's methods

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

U**NIT – IV: Unconstrained Optimization Technique:** Univariate method, Powell's method and steepest descent method.

UNIT – V: Dynamic Programming:

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

TEXT BOOKS:

1. "Engineering optimization: Theory and practice"-by S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. "Introductory Operations Research" by H.S. Kasene & 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
5. Convex Optimization -by Stephen Boyd, PHI

2014-15 **CODE: 402C1**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

ELECTRICAL DISTRIBUTION SYSTEMS
(Elective-II)

Objective;
This subject deals general concepts of distribution systems and its modeling and characteristics, design of feeders and its system analysis, protection of relays and its co-ordination and various compensation of power factor and voltage control.

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 AND SUBSTATIONS

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

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

UNIT – III SYSTEM ANALYSIS

Voltage drop and power-loss calculations: Derivation for voltage drop and power loss in lines, manual methods of solution for radial networks, three phase balanced primary lines.

UNIT – IV PROTECTIVE DEVICES AND COORDINATION

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

Coordination of Protective Devices: General coordination procedure.

UNIT – V COMPENSATION FOR POWER FACTOR IMPROVEMENT AND VOLTAGE CONTROL

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

Voltage Control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop compensation.

TEXT BOOK:

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

ELECTRICAL ESTIMATION AND COSTING
(Elective-II)

Objective: To expose the subject highlights on elements of estimation and costing, budgeting of service connections and also about contracting, maintenance.

UNIT-1 ELEMENTS OF ESTIMATING & COSTING OF DOMESTIC AND INDUSTRIAL WIRING
Definition of "Estimation", Types of estimation and estimation tools, Overhead and service charges, Purchase procedure. Layout and wiring diagram for residential building and industrial wiring, Selection of number of circuit for project as per IE rules, Estimation for residential wiring and industrial wiring, I.E. rules observed for above wiring.

UNIT-2 ESTIMATING & COSTING OF SERVICE CONNECTIONS
Survey work for domestic and industrial service connection, Lay out/ wiring diagram of service connection (given project work), List of materials and accessories along with specifications required for given project work, Estimation of service connection for domestic and industrial (1phase and 3phase) service connections, I.E. rules pertaining to above wiring.

UNIT-3 ESTIMATION OF OVER HEAD AND UNDERGROUND DISTRIBUTION LINE
Survey work for estimation of overhead and underground distribution system, Planning and layout of project, List of materials and accessories required for the given project, Procedure for preparing estimate for 440 V, 3 phase, 4 wire or 3 wire overhead and underground distribution system, Necessary drawing/ sketches of overhead and underground service connection, I.E. rules pertaining to above project.

UNIT-4 ESTIMATING & COSTING OF ELECTRICAL PRODUCT
Market survey for cost of given product like D.O.L. starter, small motor, monoblock pump, automatic electric iron, table/ceiling fan, ICDP/ICTP switch etc, Preparation of detailed drawing work of the product, Preparation of material quantity sheet for the product, Market survey for availability of required materials, their cost and other requirements, Preparation of cost schedule of product, Find out cost of product considering material cost, labour cost and overhead charges, Validation of cost schedule, Financial arrangement for the product.

UNIT-5 ESTIMATING & COSTING OF REPAIR & MAINTENANCE OF ELECTRICAL DEVICES AND EQUIPMENT & CONTRACTING
Location of fault, Materials required and their cost for remedial measure of fault, Estimation of repairing cost.
Estimation of maintenance, servicing and testing cost including labour cost(service charge), Tools used for repairs & maintenance work, Detailed estimation and preparation of cost schedule for repair and maintenance of electric fan, automatic electric iron, single phase transformer, mixy, D.O.L.starter etc.

Principles of contracting :Terms, conditions, and types of contract system,Tender,tendering procedure and preparation of simple tender, Terms and conditions of tender, procedure for inviting and scrutinizing of tender, Importance of Earnest Money Deposit, Security Deposit and S.O.R

TEXT BOOKS:
(1) S.L. Uppal- Khanna Publisher Electrical wiring, estimating and costing.
(2) S.K. Bhattacharya - TTTI, Chandigarh

REFERENCE BOOKS:
1. M.N. Bajpai- Saroj publication. Electrical estimating and costing.
2. S.O.Rs of P.W.D. Govt. departments.
3. I.E. rules gadget.
4. Electrical costing, estimating and contracting

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem **L T/P/D C**
4 -/-/- 4

EMBEDDED SYSTEMS DESIGN
(Elective-II)

Course Objectives:

For embedded systems, the course will enable the students to:

- Understand the basics of an embedded system
- Program an embedded system
- To learn the method of designing an Embedded System for any type of applications.
- To understand operating systems concepts, types and choosing RTOS.
- Design, implement and test an embedded system.

UNIT -I:
Introduction to Embedded Systems
Definition of Embedded System, Embedded Systems Vs General Computing Systems, History of Embedded Systems, Classification, Major Application Areas, Purpose of Embedded Systems, Characteristics and Quality Attributes of Embedded Systems.

UNIT -II:
Typical Embedded System:
Core of the Embedded System: General Purpose and Domain Specific Processors, ASICs, PLDs, Commercial Off-The-Shelf Components (COTS), Memory: ROM, RAM, Memory according to the type of Interface, Memory Shadowing, Memory selection for Embedded Systems, Sensors and Actuators, Communication Interface: Onboard and External Communication Interfaces.

UNIT -III:
Embedded Firmware:
Reset Circuit, Brown-out Protection Circuit, Oscillator Unit, Real Time Clock, Watchdog Timer, Embedded Firmware Design Approaches and Development Languages.

UNIT -IV:
RTOS Based Embedded System Design:
Operating System Basics, Types of Operating Systems, Tasks, Process and Threads, Multiprocessing and Multitasking, Task Scheduling.

UNIT -V:
Task Communication: Shared Memory, Message Passing, Remote Procedure Call and Sockets, Task Synchronization: Task Communication/Synchronization Issues, Task Synchronization Techniques, Device Drivers, How to Choose an RTOS.

TEXT BOOKS:

1. Introduction to Embedded Systems - Shibu K.V, Mc Graw Hill.

REFERENCE BOOKS:

1. Embedded Systems - Raj Kamal, TMH.
2. Embedded System Design - Frank Vahid, Tony Givargis, John Wiley.
3. Embedded Systems – Lyla, Pearson, 2013
4. An Embedded Software Primer - David E. Simon, Pearson Education.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE I-Sem

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

MICROPROCESSORS AND MICROCONTROLLERS LAB

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

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.

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

Advanced English Communication Skills Lab

Introduction:

Effective Communication binds any progressive organization. At the B Tech third year level, the Advanced English Communication skills laboratory is introduced to help students succeed in attaining a challenging and a professional career. Each unit aims to reinforce learning and helps the learners perform well before and after they enter the world of work. The course is designed to be practical, stimulating and challenging providing opportunities to the learners to go beyond the classrooms and get empowered in language skills. The course also enables the students understand the employers' expectations that are varied from company to company while giving them insight into the acceptable norms of attitude, behavior and etiquette.

Objectives:

- To help the students understand the requisites to successfully deliver as professionals and the challenges they need to encounter
- To help them make a smooth transition from the academic world to the professional world
- To refine the style of individual communication
- To broaden and raise awareness about the dynamics of communication in the work environment
- To integrate the learning experience with the functional areas of communication
- Helping the students to become industry ready

Outcomes

- Since the communication skills cannot be taught but be developed through practice the student will be competent communicators through application and the use of the concepts and activities in different units.
- Students are competent to take a smooth transition from the academic world to the professional world
- Students are industry ready

Methodology:

Facilitator's role: Since classroom learning augments thinking process, helping them to develop written, spoken and non verbal communication, the facilitator / Faculty would briefly discuss the topics with the students and later on guide them while the students involve in activities, writing work and while making presentations. The facilitator is required to design a lot of practical/industry oriented project works for the students

*Students are required to participate, perform, write and submit the work in the form of written documents or Power Point Presentations to hone their spoken written and non verbal communication skills . Students are to take up field work and submit the project work.

Unit I

Industry awareness- Introduction to the world of work- Collection of information about various sectors, companies, enterprises, organizations and conglomerates; field visit to the industry they wish to work for

Instruction: Here the students are required to work in teams- Team players-participating and responding, team leader - delegates, plans and involves all the team members, Challenges the team faces -the report presented in the written form and making presentation

Unit II

Job hunt process

- SWOT analysis, correspondence and browsing the internet , job application-cover letter drafting, drafting a winning resume', types of resume's -electronic, video and printed resume's

- Instruction: Students are required to prepare their video resume which will be assessed by the faculty member.

Unit III

Group Discussion- Initiators- Contributor-Informer-Team Leader-Motivator-Creative Contributor , Importance of , Non verbal communication -eye contact, voice characters, posture, gestures, do's and don'ts, Role play and Simulation- Learners assuming the roles of characters and participating in Group discussion, analysis, or prediction with strictly defined goals.

Unit IV

Interview skills- Preparing for the interview, types of interviews, interview session, importance of non verbal communication during the interview, do's and don'ts of interview, follow up and thanking letter. FAQ's.

Unit V

Office etiquette- Formal Conversation, elevator etiquette, table manners, office attire- do's and don'ts, gossips and rumors, greetings and meetings, speaking to seniors and handshakes , offering and taking visiting cards.

Unit VI

E- Correspondence and Email etiquette

Common web mail services, yahoo, gmail etc, fields to pay attention- To:, Cc:, Bcc:, Reply All, Subject, Salutation, Body, Signature, Font, Caps Lock , Highlight, The 'KISS' strategy(Keep It Simple and Short,)Points to remember while signing off, Introduction to Technical Vocabulary

- This unit is purely for internal assessment/evaluation

Unit VII

Report writing- types of report, project report writing, technical reports, importance of pictorial presentation- graphs , diagrams etc

Instruction: The students are required to work on a project. Field work and collection of information , prepare a project report, present the project in the form of Power Point Presentation and written document. This report will be given weightage during the external examination

Outcome

Since the communication skills cannot be taught but be developed through practice the student will be competent communicator through application and the use of the concepts and activities in different units.

Reference Books

- Handbook of practical Communication Skills by Chrissie Wright
- How to win friends and influence people by Dale |Carnegie
- Skills with people by Les Giblin
- Bringing out the best in people by Aubrey Daniels
- The definitive book on body Language by Barbara and Allan Pease

- Just Listen :Discover the Secret to getting through to absolutely anything by Mark Goulstone
- Ten Much by A G Krishna Murthy
- Communication skills for Professionals by Cambridge Publishers
- Good practice Student's book on Communication skills by Cambridge Publishers
- Word Power Made Easy by Norman Lewis
- Effective Technical Communication by Ashraf Rizbi
- Resume Magic: Trade Secrets of a Professional Resume by Susan Britton Whitcomb

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

FUNDAMENTALS OF H.V.D.C. TRANSMISSION AND FACTS DEVICES

Objective;

This subject deals with the basic concepts of HVDC and its applications, analysis of HCDC converters with their control circuitry .This subject also includes reactive power control, power flow with compensation devices or controllers including voltage source converter also.

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.

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-III REACTIVE POWER CONTROL IN HVDC

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

POWER FLOW ANALYSIS IN AC/DC SYSTEMS

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

Unit IV : POWER FLOW AND DYNAMIC STABILITY

Transmission interconnections, power flow in an AC System, loading capability limits, Power flow and Dynamic stability considerations, importance of controllable parameters.

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 V : VOLTAGE SOURCE CONVERTERS:

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.

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.
3. . "Understanding FACTS " N.G.Hingorani and L.Guygi, IEEE Press. Indian Edition is available:--Standard Publications, 2001.

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.

4. "Flexible a c transmission system (FACTS)" Edited by YONG HUE SONG and ALLAN T JOHNS, Institution of Electrical Engineers, London.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

NEURAL NETWORKS AND FUZZY LOGIC
(Elecitve-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: 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.

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

Unit IV:Associative Memories & Architecture

Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory),

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

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

Unit – V: Classical & Fuzzy Sets & Fuzzy sysems

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

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

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

DISASTER MANAGEMENT
(Elective-III)

Course Objectives

- To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
- To increase the knowledge and understanding of the International Strategy for Disaster Reduction and to increase skills and abilities for implementing the Disaster Risk Reduction (DRR) Strategy.
- To ensure skills and abilities to analyse potential effects of disasters and of the strategies and methods to deliver public health response to avert these effects.
- To ensure skills and ability to design, implement and evaluate research on disasters

UNIT-I

ENVIRONMENTAL HAZARDS & DISASTERS: Meaning of Environmental hazards, Environmental Disasters and Environmental stress. Concept of Environmental Hazards, Environmental stress & Environmental Disasters. Different approaches & relation with human Ecology - Landscape Approach - Ecosystem Approach -

Perception approach - Human ecology & its application in geographical researches.

TYPES OF ENVIRONMENTAL HAZARDS & DISASTERS: Natural hazards and Disasters – Man induced hazards & Disasters - Natural Hazards- Planetary Hazards/ Disasters - Extra Planetary Hazards/ disasters - Planetary Hazards- Endogenous Hazards - Exogenous Hazards

UNIT –II

ENDOGENOUS HAZARDS - Volcanic Eruption – Earthquakes – Landslides – Volcanic Hazards/ Disasters - Causes and distribution of Volcanoes - Hazardous effects of volcanic eruptions - Environmental impacts of volcanic eruptions – Earthquake Hazards/ disasters - Causes of Earthquakes - Distribution of earthquakes - Hazardous effects of - earthquakes - - Earthquake Hazards in India - - Human adjustment, perception & mitigation of earthquake.

EXOGENOUS HAZARDS/ disasters - Infrequent events- Cumulative atmospheric hazards/ disasters, Infrequent events: Cyclones – Lightning – Hailstorms, Cyclones: Tropical cyclones & Local storms - Destruction by tropical cyclones & local storms (causes , distribution human adjustment, perception & mitigation), Cumulative atmospheric hazards/ disasters : - Floods- Droughts- Cold waves- Heat waves Floods:- Causes of floods- Flood hazards India- Flood control measures (Human adjustment, perception & mitigation), Droughts:- Impacts of droughts- Drought hazards in India- Drought control measures- Extra Palnetary Hazards/ Disasters-

Man induced Hazards /Disasters- Physical hazards/ Disasters-Soil Erosion Soil Erosion:-- Mechanics & forms of Soil Erosion- Factors & causes of Soil Erosion- Conservation measures of Soil Erosion, Chemical hazards/ disasters:-- Release of toxic chemicals, nuclear explosion- Sedimentation processes, Sedimentation processes:- Global Sedimentation problems- Regional Sedimentation problems- Sedimentation & Environmental problems- Corrective measures of Erosion & Sedimentation, Biological hazards/ disasters:- Population Explosion.

UNIT –III:

EMERGING APPROACHES IN DISASTER MANAGEMENT- Three Stages

1. Pre- disaster stage (preparedness)
2. Emergency Stage
3. Post Disaster stage-Rehabilitation

Natural Disaster Reduction & Management

a) Provision of Immediate relief measures to disaster affected people

b) Prediction of Hazards & Disasters

c) Measures of adjustment to natural hazards

UNIT –IV

DISASTER MANAGEMENT- An integrated approach for disaster preparedness, mitigation & awareness.

Mitigation- Institutions- discuss the work of following Institution.

a. Meteorological observatory

b. Seismological observatory

c. Volcanology instituition

d. Hydrology Laboratory

e. Industrial Safety inspectorate

f. Institution of urban & regional planners

g. Chambers of Architects

h. Engineering Council

i. National Standards Committee

Integrated Planning- Contingency management Preparedness –

a) Education on disasters

b) Community involvement

c) The adjustment of Human Population to Natural hazards & disasters Role of Media Monitoring Management- Discuss the programme of disaster research & mitigation of disaster of following organizations.

a) International Council for Scientific Unions (ICSU)- Scientific committee on problems of the Environment (SCOPE), International Geosphere- Biosphere programme (IGBP)

b) World federation of Engineering Organizations(WFED)

c) National Academy of Sciences

d) World Meteorological organizations(WMO)

e) Geographical Information System(GIS)

f) International Association of Seismology & Physics of Earth's Interior (IASPEI)

g) Various U.N agencies like UNCRD, IDNDR, WHO, UNESCO, UNICEF, UNEP.

UNIT –V:

a. A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills with particular reference to India

b. Ecological planning for sustainability & sustainable development in India- Sustainable rural development: A Remedy to Disasters -Role of Panchayats in Disaster mitigations

c. Environmental policies & programmes in India- Institutions & National Centres for Natural Disaster reduction, Environmental Legislations in India, Awareness, Conservation Movement, Education & training

Course Outcomes

- Capacity to integrate knowledge and to analyse, evaluate and manage the different public health aspects of disaster events at a local and global levels.
- Capacity to describe, analyse and evaluate the environmental, social, cultural, economic, legal and organisational aspects influencing vulnerabilities and capacities to face disasters.

- Capacity to work theoretically and practically in the processes of disaster management (disaster risk reduction, response, and recovery) and relate their interconnections, particularly in the field of the Public Health aspects of the disasters.
- Capacity to manage the Public Health aspects of the disasters.
- Capacity to obtain, analyse, and communicate information on risks, relief needs and lessons learned from earlier disasters in order to formulate strategies for mitigation in future scenarios with the ability to clearly present and discuss their conclusions and the knowledge and arguments behind them.

TEXT BOOK:

1. Disaster Mitigation: Experiences And Reflections by Pardeep Sahni

REFERENCES:

1. R.B.Singh (Ed) Environmental Geography, Heritage Publishers New Delhi,1990
2. Kates,B.I & White, G.F The Environment as Hazards, oxford, New York, 1978
3. R.B. Singh (Ed) Disaster Management, Rawat Publication, New Delhi, 2000
4. H.K. Gupta (Ed) Disaster Management, Universiters Press, India, 2003
5. Dr. Satender , Disaster Management t in Hills, Concept Publishing Co., New Delhi, 2003
6. A.S. Arya Action Plan For Earthquake,Disaster, Mitigation in V.K. Sharma (Ed) Disaster Management IIPA Publication New Delhi, 1994
7. R.K. Bhandani An overview on Natural & Manmade Disaster & their Reduction, CSIR, New Delhi
8. M.C. Gupta Manuals on Natural Disaster management in India, National Centre for Disaster Management, IIPA, New Delhi, 2001

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

RELIABILITY ENGINEERING AND IT APPLICATIONS TO POWER SYSTEMS
(Elecitve-III)

Objective ;

This subject deals with the basic of probability its theorem and extension to reliability and its analysis. The markov modeling plays a major role in control system applications so its evaluation models are also studied in terms of frequency and duration techniques.

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 & Reliability functions

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

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 – III 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 – IV 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 – V GENERATION SYSTEM , COMPOSITE SYSTEMS AND DISTRIBUTION 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.

Reliability Analysis

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

Distribution systems

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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

LINEAR SYSTEMS ANALYSIS
(Elective-III)

Objective ;

This subject deals with types of analogous system and their classifications and mathematical modeling with different examples. This subject is extension to the control systems basics which already studied and also network theory. It highlights the importance of mathematical transforms like Fourier, Laplace and etc.

UNIT-I ANALOGOUS SYSTEMS

Analogous systems – Classifications of systems – linear, non linear , dynamic and static – time invariant systems – mechanical systems – translational and rotationalsystems dalembert's principle – force voltage analog – force current analog- mechanical coupling device – gears – mathematical representation – state variable representation simple problems

UNIT – II 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–III FOURIER SERIES AND FOURIER TRANSFORM REPRESENTSATION

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

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

Representation of non periodic functions - 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-VNETWORK SYSNTHESIS

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

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

TEXT BOOKS:

1. Linear system analysis – A. Chang
2. Network analysis and synthesis – B C Kuo
3. Network Analysis and Synthesis – Umesh Sinha- Satya Prakashan Publications

REFERENCE BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE

(Autonomous)

IV Year B.Tech EEE II-Sem

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

ADVANCED CONTROL SYSTEMS
(Elecitve-IV)

Objective ;

This subject deals with the detailed introduction to stability in terms of controllability and observability, and different non-linear systems and their properties and their analysis with different methods like describing function, phase plane methods. It also deals with modal control with optimization and principles of variation in calculus.

UNIT – I 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.

STABILITY ANALYSIS

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

UNIT – II DESCRIBING FUNCTION ANALYSIS

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

UNIT – III PHASE-PLANE ANALYSIS

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

UNIT - IV 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 –V OPTIMAL CONTROL AND CALCULUS OF VARIATIONS

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

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

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.

2014-15 **CODE:402E2**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

EHV AC TRANSMISSION
(Elective-IV)

Objective ;

This subject deals with the necessity of EHV AC transmission and modes of propagation with examples. It also discussed with corona effects, voltage control and travelling wave theory.

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.

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

Unit – II: Voltage gradients of conductors:
Electrostatics – field of sphere gap – field of line changes and properties – charge – potential relations for multi-conductors – surface voltage gradient on conductors – distribution of voltage gradient on sub-conductors of bundle – Examples.

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

Unit – IV: Electro static field AND Traveling wave theory
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.
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 –V: Voltage control:

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

TEXT BOOKS:

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

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

INTRODUCTION TO NANOTECHNOLOGY
(Elective-IV)

Objective ;

This subject deals with the detailed introduction to nano materials and its technology. In addition the different nano techniques and their characterization with applications are also discussed.

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

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

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-III: Nano scale characterization techniques:
Scanning probe techniques (AFM, MFM,STM,SEM,TEM), XRD.
Nanodevices and Nanomedicine:
Lab on chip for bioanalysis, core/Shell Nanoparticles in drug delivery system I(site specific and targeted drug delivery), cancer treatment, and bone tissue treatment.

UNIT-IV: Nano and molecular electronics:
Resonant-Tunneling structures, single electron tunneling, single Electron transistors, coulomb blockade, giant magneto resistance, tunneling magneto resistance.
UNIT-V: Nanolithography and Nanomanipulation:
e-beam lithography and SEM based nanolithography and nanomanipulation, Ion beam lithograpy, oxidation and metallization. Mask and its application, Deep UV lithography, X-ray based lithography.

TEXT BOOKS:

1. Charles,p.pode, 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.

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech EEE II-Sem

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

Electrical Power Quality
(Elective-IV)

Objective ;

This subject deals with the definition of power quality and types of power quality and their issues and solutions. It also discussed some of the power quality problems like interruptions, voltage sag and swells with their reliability evaluation .

Unit 1: introduction:

Introduction of the power quality 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.

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 III: Voltage sag-characterization

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.

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

Unit IV: 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 V: 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.

Power quality and EMC standards:
Introduction to standardization, IEC electromagnetic compatibility standards, European voltage characteristics standards, PO surveys.

TEXT BOOK:

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

2014-15 **Code: 40224**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

INDUSTRY ORIENTED MINI PROJECT

2014-15 **Code: 40225**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

SEMINAR

2014-15 **Code: 40226**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

IV Year B.Tech. EEE. II –Sem **L T/P/D C**
0 -/15/- 10

PROJECT WORK

2014-15 **Code: 40227**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

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

COMPREHENSIVE VIVA