ACADEMIC REGULATIONS

COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS & COMMUNICATION ENGINEERING

For

B. Tech. Four Year Degree Course

(Applicable for the batch admitted in 2014-15)
(MR-14 Regulations)
(I,II,III &IV Years Syllabus)

MALLAREDDY ENGINEERING COLLEGE (Autonomous)

(Approved by AICTE & Affiliated to JNTUH)

Maisammaguda, Dhulapally (Post & Via Kompally), Secunderabad-500 100

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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: **principal@mrec.ac.in**

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	04
	Practical - 03	
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.

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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

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

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 up to Third year First semester examination

(or)

44 credits (out of 112) secured from all Regular and Supplementary examinations conducted up to 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 be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The 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)
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
(MR14 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 - 1	2	1/3/-	4
40502	Computer Programming Lab	--	-/3/-	2
40P03	Engineering Physics Lab	--	-/3/-	2
40305	Engineering & IT Workshop	--	-/3/-	2
	Total	20	1/12/-	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	4/9/-	28

II Year I Semester

Code	Subject	L	T/P/D	C
40401	Electronic Devices and Circuits	4	1/-/-	4
40402	Probability Theory and Stochastic Processes	4	1/-/-	4
40403	Switching Theory and Logic Design	4	-/-/-	4
40M04	Mathematics - IV	4	-/-/-	4
40201	Electrical Circuits	4	1/-/-	4
40404	Signals and Systems	4	1/-/-	4
40405	Electronic Devices and Circuits Lab	-	-/3/-	2
40406	Basic Simulation Lab	-	-/3/-	2
	Total	24	4/6/-	28

II Year II Semester

Code	Subject	L	T/P/D	C
40228	Principles of Electrical Engineering	4	-/-/-	4
40407	Pulse and Digital Circuits	4	1/-/-	4
40408	Electromagnetic Theory and Transmission Lines	4	1/-/-	4
40109	Environmental Studies	4	-/-/-	4
40409	Electronic Circuit Analysis	4	1/-/-	4
40410	Digital Design using Verilog HDL	4	-/-/-	4
40411	Electronic Circuits And Pulse Circuits Lab	-	-/3/-	2
40229	Electrical Technology Lab.	-	-/3/-	2
	Total	24	4/6/-	28

III Year I Semester

Code	Subject	L	T/P/D	C
40211	Control Systems	4	1/-/-	4
40538	Computer Organization and Operating Systems	4	-/-/-	4
40412	Linear and Digital IC Applications	4	1/-/-	4
40413	Antennas and Wave Propagation	4	1/-/-	4
40414	Analog Communications	4	1/-/-	4
40B01	Managerial Economics and Financial Analysis	4	-/-/-	4
40415	Analog Communications Lab.	-	-/3/-	2
40416	Linear and Digital IC Applications Lab	-	-/3/-	2
	Total	24	4/6/-	28

III Year II Semester

Code	Subject	L	T/P/D	C
40417	Digital Communications	4	1/-/-	4
40418	Digital Signal Processing	4	1/-/-	4
40419	Microprocessors and Microcontrollers	4	1/-/-	4
40420	Electronic Measurements and Instrumentation	4	1/-/-	4
40B02	Management Science	4	-/-/-	4
 40B04 401A1 40B05	Open Elective: Human Values and Professional Ethics Disaster Management Intellectual Property Rights	4	-/-/-	4
40421	Microprocessors and Microcontrollers Lab.	-	-/3/-	2
40422	Digital Signal Processing Lab.	-	-/3/-	2
40E07	Advanced English Communications Skills Lab	-	-	-
	Total	24	4/6/-	28

IV Year I Semester

Code	Subject	L	T/P/D	C
40516	Computer Networks	4	-/-/-	4
40423	Microwave Engineering	4	1/-/-	4
40424	VLSI Design	4	1/-/-	4
40425	Cellular and Mobile Communications	4	1/-/-	4
 404A1 404A2 40535	Elective -I: Digital Image Processing Multimedia and Signal Coding Object Oriented Programming through Java	4	1/-/-	4
 404B1 404B2 404B3	Elective -II: Television Engineering Optical Communications Embedded Systems Design	4	-/-/-	4
40426	ECAD and VLSI Lab	-	-/3/-	2
40427	Microwave Engineering and Digital Communications Lab	-	-/3/-	2
	Total	24	4/6/-	28

IV Year II Semester

Code	Subject	L	T/P/D	C
404C1 404C2 404C3	Elective -III: Satellite Communications Biomedical Instrumentation Artificial Neural Networks	4	1/-/-	4
404D1 404D2 40536	Elective -IV: Telecommunication Switching Systems and Networks Radar Systems Network Security & Cryptography	4	1/-/-	4
404E1 404E2 404E3	Elective -V: Wireless Communications and Networks Digital Signal Processors and Architectures RF Circuit Design	4	1/-/-	4
40428	Industry Oriented Mini Project	-	-/-/-	2
40429	Seminar	-	-/-/6	2
40430	Major Project	-	-/15/-	10
40431	Comprehensive Viva	-	-/-/-	2
	Total	12	3/15/6	28

2014-2015 **Sub code: 40E01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – I Sem

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

ENGLISH- I
(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.

Course Objectives:

- To facilitate for the improvement of the language proficiency of the students in English with emphasis on Reading and writing skills.
- To equip the students to study academic subjects more effectively using the theoretical and practical components of the English syllabus.
- Analyzing intensive reading strategies and discussing how to distinguish between facts and opinions and draw inferences.
- Enable the students to improve effective writing skills.
- 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 Pilgrim' 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

TEXTBOOKS:
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

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:

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

2014-2015 **Sub code: 40P01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – I Sem

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

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

Course Objectives:

- To teach the students classification of materials based on the arrangement of atoms, basic concepts of crystallography.
- To make the students learn the concepts of defects in crystals.
- To make the students understand the concept of SHM, and different kinds of oscillations.
- To teach the students the concept of dual nature of matter and experimental support to this concept
- To expose the students to classical free electron theory and quantum free electron theory and their drawbacks.
- To teach the students the Band theory and classification of materials based on band theory.
- To make the students understand the concepts of Fermi level and charge carrier concentrations in semi conductors.
- To make the students get acquainted with the p n junction diode and its characteristics.
- 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 p n 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., 3rd Edition.
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 Pandey, S Chaturvedi, Cengage learning

REFERENCES:

1. Solid State Physics – M. Armugam (Anuradha Publications).
2. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co.
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:

- 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.
- 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.
- 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
- 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.
- 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.
- 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 p n junction diode, its characteristics and the associated breakdown mechanisms.
- They shall be able to understand the Faraday's laws of electromagnetism and get introduced to Maxwell's equations.

2014-2015 **Sub code: 40C01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – 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 applications in the area of engineering.
- To explore the economically viable technologies developed for utilizing water resources and to provide basic skills in chemical analysis of water and materials.
- To study the chemistry of portable energy storage devices like various conventional as well as modern batteries and their usage in different aspects of life.
- To gain the knowledge of corrosion science and anti corrosive techniques to protect faster corrosion and monitoring of corrosion.
- To predict and control the 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 and 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, 4th Edition, 1996.
2. M.G. Fontana, N. D. Greene, Corrosion Engineering, McGraw Hill Publications, New York, 3rd Edition, 1996.
1. Principles of Physical Chemistry B.R.Puri, L.R.Sharma & M.S.Pathania, S.Nagin Chand &Co., (1993)., (23rdedition) New Delhi.

Course Outcomes:

- Familiarize the student with the fundamentals of the treatment technologies and the considerations for its design and implementation in water treatment plants.
- Understand the operating principles of various types of electrochemical cells, including fuel cells and batteries.
- Analyze and develop a technically sound, economic and sustainable solution to corrosion problems related to engineering service.
- Be able to apply core concepts in Materials Science to solve engineering problems

2014-2015 **Sub code: 40M01**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – I Sem

L	T/P/D	C
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Mathematics – I
(Theory of Matrices & ODE)
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

- Finding inverse of a matrix by elementary transformations
- Solving system of simultaneous equations
- Calculate the powers of the matrix & Calculate the inverse of the matrix by CHT
- Know about the properties of the Eigen values and Vectors, Quadratic forms
- Know the Applications of second order differential equations
- 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 -Evalution 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

REFERENCES:

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 Pub. 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 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:

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

2014-2015 **Sub code: 40501**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

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

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

Course objectives:

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

UNIT I:
Introduction to computers: computer systems, Number systems, computer languages, creating and running Programmes, software development method, algorithms, pseudo code, flow charts.
Introduction to c language: Basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values, C Preprocessor.

UNIT II:
Operators and control statements: Statements, operators, type conversions, expressions and evaluation, input and output statements, sample programs. : If and switch statements, while, do while and for statements.
arrays and **Strings:**Define and initialization of one and multi dimensional arrays**.** Defining **String** and operations on strings, string handling functions. Sample Programmes.

UNIT III:
Functions: Defining and accessing, passing arguments, function prototypes, library functions, static functions, user defined functions, recursive functions, passing arrays to a function, variables and storage classes, header files, Macros.
Pointers: Basic Concepts, pointer to pointer, pointer arithmetics, pointers and arrays, arrays of pointers, function pointers, dynamic memory allocation.

UNIT IV:
Structures and Unions: Declaration, Definition and initialization of structures, Nested structures, Array of structures.
Console and file I/O: File, types of files, file structure, file attributes, file operations, standard I/O, Binary I/O, formatted I/O.

UNIT V :

Open Source - LINUX and PHP:

What is an Open Standard, Open Standards Model, Industries needing standards, The Impact of Standards, Open Source Software, Open Source, Open Source Technology, The OPEN Proposition?

Linux: What is Linux, Background of Linux, Why is Linux so popular, what can you do with Linux, Linux Distributions, Linux Technology Center, Future of Linux.

PHP: - What is PHP, PHP – Key Driver of LAMP Stack, Getting Started with PHP, Unified ODBC, PHP Data Objects, PHP Deployment Platform, What is Zend Core, Features and Benefits, Zend and IBM, What is Ruby, What is Rails.

TEXT BOOKS:

1.C programming A Problem-Solving Approach by Behrouz A.Forouzan, E.V.Prasad, Richard F.GilbergC How to Program Paul Deitel and Harvey Deitel , PH.

2.Computer Programming and Data Structures by E Balagurusamy, Tata McGraw Hill.

3.Unix Concepts and Applications, 4th Edition, Sumitabha Das, TMH,2006.

4. Beginning PHP 5.3, by Matt Doyle, SPD/Wrox Press-2011

REFERENCE BOOKS:

1. Problem Solving and Program Design in C, J.R Hanly and E.B Koffman, Fifth Edition, Pearson education.

2. The C Programming Language by Brian W. Kernighan, Dennis M. Ritchie.

3. Absolute beginner's guide to C, Greg M. Perry, Edition 2,Publisher: Sams Pub., 1994.

4. C Programming by D.Ravi Chandran

5. The C Programming Language B.W. Kernighan and Dennis M.Ritchie, PHI/pearson Education.

6. C programming with problem solving, J.A.Jones & K.Harrow, dreamtech press

7. Let Us C Yashavant kanetkar BPB.

Course Outcomes:

- Write, compile and debug programs in C language.
- Use different data types in a computer program.
- Design programs involving decision structures, loops, arrays and functions.
- Understand the dynamics of memory by the use of pointers.
- Use different file operations to create/update basic data files.
- Able to create basic web pages using PHP Deployment and Linux platform

2014-15 **Code: 40301**

MALLA REDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE 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.

2014-2015 **Sub code: 40502**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – I Sem

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

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

Course objectives:

- Gain a working knowledge of C programming to write modular, efficient and readable C programs by Identifying the structural elements and layout of C source code.
- Declare and manipulate single and multi-dimensional arrays of the C data types and derived data types like structures, unions.
- Use functions from the portable C library and to describe the techniques for creating program modules using functions and recursive functions.
- Manipulate character strings in C programs. Utilize pointers to efficiently solve problems
- Allocate memory to variables dynamically and Perform operations on text and binary files.

Week l:
Practice various DOS internal and external commands.

Week 2:
1. Implement various programme logics using algorithms and flowcharts.
2. Practice various debugging techniques using simple C programs.

Week 3:
a) Write a C program to find the sum of individual digits of a positive integer.

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

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

Week 4:
a) Write a C program to calculate the following Sum: Sum=$1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$
b) Write a C program to find the roots of a quadratic equation.

Week 5:
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 reverse of a number.(e.g. reverse of 123 is 321)

b) Write a C program to find whether the given number is Palindrome or not. (Note: palindrome means reverse of a number should be equal to the given number)

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

Week 7:

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

b) Write a C program that uses functions to perform the following:

i) Addition of Two Matrices

ii) Multiplication of Two Matrices

Week 8:

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

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

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

b) Write a C program to determine if the given string is a palindrome or not

Week 9:

a) Write a C program that displays the position or index in the string S where the string T begins, or – 1 if S doesn‘t contain T.

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

Week 10:

a) Write a C program to generate Pascal‘s triangle.

b) Write a C program to construct a pyramid of numbers.

Week 11:

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

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 12:

a) 2‘s complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2‘s complement of 11100 is 00100. Write a C program to find the 2‘s complement of a binary number.

b) Write a C program to convert a Roman numeral to its decimal equivalent.

Week 13:

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

i) Reading a complex number

ii) Writing a complex number

iii) Addition of two complex numbers

iv)Multiplication of two complex numbers (Note: represent complex number using a structure.)

Week 14:

a) Write a C program which copies one file to another.

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.)

Course Outcomes:

- Understand the basic terminology used in computer programming and to write, compile and debug programs in C language.
- Design programs involving decision structures, loops ,arrays and functions.
- Understand the dynamics of memory by the use of pointers.
- Use different file operations to create/update basic data files.

2014-2015 **Sub code: 40P03**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – I Sem

L	T/P/D	C
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ENGINEERING PHYSICS LAB
(Common to EEE/ECE/CSE)

Course Objectives:

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

(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 Practicals by Dr.B.Srinivasa Rao, KesavaVamsiKrishna.V, K.S.Rudramamba.

(University Science Press)

Course Outcomes:

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

2014-2015 **Code: 40305**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech – 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

Objective: The objective of this subject is 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:

a) Carpentry
b) Fitting
c) Tin-Smithy and Development of jobs carried out and soldering.
d) House-wiring.
e) Foundry.

2. TRADES FOR DEMONSTRATION

a) Machine shop
b) 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

Outcome: At the end of this course 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

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).

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 **Sub code: 40E02**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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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:

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

- To create an awareness on Engineering Ethics and Human Values.
- To understand social responsibility of an engineer.

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:

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:

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

2014-2015 **Sub code: 40P02**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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

Course Objectives:

- To teach the students the phenomenon of Interference, Diffraction and Polarization.
- To make the students aware of X – ray diffraction and different techniques of it.
- To make the students understand the characteristics of LASER, different working LASERs.
- To teach various applications of LASERs.
- To teach the students, basic definitions related to Dielectric materials, different kinds of polarization, and different Dielectric materials.
- To introduce them the phenomenon of superconductivity and its applications.
- To teach the students the significance of nano size and its fascinating applications.
- To teach the students working principle of optical fiber, classification of optical fibers and applications of optical fibers.
- To teach the production and detection of ultrasonic 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., 3rd Edition.
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 Pandey, S Chaturvedi, Cengage learning
7. A Text book of Optics by N Subrahmanyam, Brijlal and M N Avadhanulu, S Chand & Co,

REFERENCES:

1. Solid State Physics – M. Armugam (Anuradha Publications).
2. A Text Book of Engg Physics – M. N. Avadhanulu & P. G. Khsirsagar– S. Chand & Co. (for acoustics).
3. 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:

- Students get introduced to the phenomenon of interference and understand the very famous Young's double slit experiment and Newton's rings experiment.
- They shall understand the concept of X – ray diffraction and the two techniques Laue method and Powder method.
- Students shall understand the theory of Double refraction as far as Polarization phenomenon is concerned.
- Students shall be able to distinguish ordinary light and LASER. They shall learn the physics behind the production of LASER.
- They shall understand and appreciate the applications of LASER.
- The students shall be able to distinguish Electronic, Ionic and orientation polarizations, understand the significance of the Clausius – Mossotti relation.
- The students shall learn regarding Piezo electric materials also.
- They shall learn Meissner effect and be able to understand the classification of superconductors into two categories.
- They shall be able to understand and appreciate the applications of Superconductivity.
- Students shall understand the influence of size of the material on its properties.
- Students shall understand the concept of total internal reflection based on which optical fibers work and understand the concepts of acceptance angle and numerical aperture.
- They shall understand and appreciate various diversified applications of optical fibers like medical application, application in instrumentation and application in communication.
- They shall be able to understand various methods of production and detection of ultrasonics besides learning their applications.
- They shall get acquainted with the basic concepts of acoustics.

2014-2015 **Sub code: 40C02**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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

Course objectives:

- 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.
- Describe the fundamental aspects of colloids, surface chemistry and properties of multi-phase systems
- Understanding how light interacts with matter and how it can be used to quantitatively understand chemical samples & engineering materials.
- 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:

- Demonstrate general knowledge and understanding concerning properties and use of polymeric materials, including knowledge and understanding of related environmental aspects.
- 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.
- 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 **Sub code: 40M02**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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MATHEMATICS – II
(Differential, Vector Calculus & Numerical Techniques)
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

- 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.
- 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.
- Understand the Rolles' theorem using intermediate value theorem ,Mean using Lagrange Mean Value theorem ,Cauchy Mean value theorem
- 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.
- 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.
- 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:

- Understands the geometrical interpretation of Rolle's, Lagrange's, Cauchy Mean value theorems,
- 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.
- Learns about the solution of transcendental equations, Understands geometrical meaning of the solution of the curves.
- 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
- Learn about vector and scalar fields, Grad, div and Curl and their applications and properties,
- 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

2014-2015 **Sub code: 40M03**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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MATHEMATICS – III
(Numerical Differentiation, Integration & Transform Techniques)
(Common to CE/EEE/ME/ECE/CSE/Mining)

Course Objectives:

- Understands the applications of z-transforms
- Find the Fourier series representation of the Periodic functions
- Find the Fourier series representation for the functions in an arbitrary interval
- Find the applications of numerical differentiation in evaluating engineering problems.
- 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

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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:

- This best-fitting curve can be obtained by the method of least squares.
- Applications of Fourier transforms in engineering problems.
- 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 **Sub code: 40503**

MALLAREDDY ENGINEERING COLLEGE
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I Year B.Tech ECE – II Sem

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

Course Objectives:

- To develop skills to design and analyze simple linear and nonlinear data Structures
- To strengthen the ability to identify and apply the suitable data structure for the given real world problem
- To give overview and maintenance on information management using open source databases.
- Overview on how to maintain data using XML and related technologies.
- Introducing Java development tools.
- To develop skills in professional to debug a programme.

UNIT I:

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

Queues: Basic queues operations, representation of a queue using array, implementation of Queue operations using array, applications of Queues, Circular queue, Double-ended Queue.

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 complexity using asymptotic notations

Searching: Basic concepts, linear search, binary search

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

UNIT IV:

Information Management : Information as a Service, IBM Information, Management Software, Order Fulfillment System – Example Case, Open Source: **Derby**, Cloudscape, DB2 9 pure XML Technology, DB2 Express-C, DB2 Data Server Editions, Information Integration Business Drivers,

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

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

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

TEXT BOOKS:

1. C Programming & Data Structures, B.A Forouzan and R.F.Gilberg, Third Edition, Cengage Learning.
2. C Programming And Data Structures, E.Balaguru Swamy, TMH
3. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
4. Beginning XML, Joe Fawcett, Danny Ayers, Liam R. E. QuinJoe Fawcett, Danny Ayers, Liam R. E. Quin, Wrox Press. 2012.
5. Eclipse: Programming Java Applications , Steve Holzner, O'Reilley, 2004.

REFERENCE 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.T.

Course Outcomes:

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identity the appropriate data structure for given problem
- Be capable to identify various open source databases.
- Be capable to create XML documents and related transformations.
- Capable of creating and executing sample Java programme.
- Capable of debug and inspecting variables in a programme
- Capable of creating projects in IDE Environment using Eclipse.
- Capable of creating Web based project and AJAX frome work.

2014-2015 **Sub code: 40C03**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – II Sem **L T/P/D C**
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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.

2014-2015 **Sub code: 40504**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – II Sem **L T/P/D C**
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DATA STRUCTURES AND SOFTWARE TOOLS LAB
(Common to EEE/ECE/CSE)

Course Objectives:

- To develop skills to design and analyze simple linear and nonlinear data Structures
- To strengthen the ability to identify and apply the suitable data structure for the given real world problem
- 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:

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

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

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
6. T.Goodrich,R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.

Course Outcomes:

- Be able to design and analyze the time and space efficiency of the data structure
- Be capable to identity the appropriate data structure for given problem
- Have practical knowledge on the application of data structures

2014-2015 **Sub code: 40E03**

MALLAREDDY ENGINEERING COLLEGE
(Autonomous)

I Year B.Tech ECE – II Sem **L T/P/D C**
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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

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.

Course Outcomes:

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

2014-2015 **Code: 40401**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

II Year B.Tech. ECE-I Sem

L	T/P/D	C
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ELECTRONIC DEVICES AND CIRCUITS

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

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

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 SEMICINDUCTORS: 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, 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 β 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.

Course Outcomes:

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

2014-2015 **Code: 40402**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

II Year B.Tech. ECE-I Sem

L	T/P/D	C
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PROBABILITY THEORY AND STOCHASTIC PROCESSES

Objectives:

- To provide mathematical background and sufficient experience so that the student can read, write, and understand sentences in the language of probability theory, as well as solve probabilistic problems in signal processing and Communication Engineering.
- To introduce students to the basic methodology of "probabilistic thinking" and to apply it to problems;
- To understand basic concepts of probability theory and random variables, how to deal with multiple random variables, Conditional probability and conditional expectation, joint distribution and independence, mean square estimation.
- To understand the difference between time averages and statistical averages
- Analysis of random process and application to the signal processing in the communication system.
- To teach students how to apply sums and integrals to compute probabilities, means, and expectations.

UNIT - I

PROBABILITY THEORY: Probability introduced through Sets and Relative Frequency, Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayes' Theorem, Independent events

UNIT - II

RANDOM VARIABLES: Definition of a random variable, classification of random variables, distribution and density functions-Gaussian, uniform, exponential, binomial, poisons, Rayleigh, conditional distribution and density functions.

OPERATIONS ON SINGLE RANDOM VARIABLE: Expectation, moments, variance and skew, characteristic function, moment generating function, transformation of random variables.

UNIT - III

MULTIPLE RANDOM VARIABLES: Joint distribution function, properties of joint distribution, marginal distribution functions, joint density function, properties of joint density function, conditional distribution and density point conditioning, interval conditioning, statistical independence, sum of two random variables, sum of several random variables, central limit theorem (without proof).

OPERATIONS ON MULTIPLE RANDOM VARIABLES: Expected value of a function of random variable, joint moments about the origin, joint central moments, joint characteristic functions, jointly Gaussian random variables, two random variables case, n random variable case, properties, transformations of multiple random variables, linear transformations of Gaussian random variables.

UNIT-IV:

Stochastic Processes – Temporal Characteristics

The Stochastic Process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, Concept of Stationarity and Statistical Independence, First-Order Stationary Processes, Second-Order and Wide-Sense Stationarity, Nth Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes, Autocorrelation Function and its Properties, Cross-Correlation Function and its Properties, Covariance and its Properties, Linear System Response of Mean and Mean-squared Value, Autocorrelation Function, Cross-Correlation Functions, Gaussian Random Processes, Poisson Random Process.

UNIT-V:

Stochastic Processes – Spectral Characteristics

Power Spectrum: Properties, Relationship between Power Spectrum and Autocorrelation Function, Cross-Power Density Spectrum, Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Spectral Density of Input and Output of a Linear System.

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, 4Ed., 2001, TMH.
2. Probability and Random Processes – Scott Miller, Donald Childers, 2 Ed, Elsevier, 2012.

REFERENCE BOOKS:

1. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, 4 Ed., TMH.
2. Theory of Probability and Stochastic Processes- Pradip Kumar Gosh, University Press
3. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, 3 Ed., PE
4. Probability Methods of Signal and System Analysis - George R. Cooper, Clave D. MC Gillem, 3 Ed., 1999, Oxford.
5. Statistical Theory of Communication - S.P. Eugene Xavier, 1997, New Age Publications.

Outcomes:

- Simple probabilities using an appropriate sample space.
- Simple probabilities and expectations from probability density functions (pdfs)
- Likelihood ratio tests from pdfs for statistical engineering problems.
- Least -square & maximum likelihood estimators for engineering problems.
- Mean and covariance functions for simple random processes.

2014-2015 **Code: 40403**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

II Year B.Tech. ECE-I Sem

L	T/P/D	C
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SWITCHING THEORY AND LOGIC DESIGN

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

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

UNIT -I:
Number System and Boolean Algebra And Switching Functions:
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.

Course Outcomes:

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

2014-2015 **Code: 40M04**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

II Year B.Tech. ECE-I Sem

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MATHEMATICS-IV

Course Objectives:

- Transforming the given variable coefficient equation (Cauchy's and Lagrange's) into the one with constant coefficients.
- Identifying ordinary points, singular points and regular singular points for the given ODE.
- Finding the series solution around a regular singular point. Solve the given ODE with variable coefficients by Frobenius method and test the convergence of its series solution.
- Series solutions for Legendre and Bessel differential equations, analyzing the properties of Legendre and Bessel polynomials.
- Differentiation and Integration of complex valued functions. Evaluation of integrals using Cahchy's integral formula.
- Taylor's series, Maclaurin's series and Laurent's series expansions of complex functions
- Evaluation of integrals using residue theorem.Transform a given function from z - plane to w – plane.

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 mapping. Standard transformations- Translation; Magnification and rotation; inversion and reflection, Transformations like e^z, log z, z^2, and Bilinear transformation. Properties of Bilinear transformation, determination of bilinear transformation when mappings of 3 points are given.

TEXT BOOKS:

1. Differential Equations with applications and historical notes, G F Simmons, Mc.grawhill Edition
2. Advanced Engineering Mathematics by Kreyszig, John Wiley & Sons.
3. Higher Engineering Mathematics by Dr. B.S. Grewal, Khanna Publishers.
4. Functions of one complex variable – J B Conway, Springer Edition, Narosa Publications
5. Mathematics For Engineers By K.B.Datta And M.A S.Srinivas,Cengage Publications

REFERENCES:

1. Complex Variables Principles And Problem Sessions By A.K.Kapoor, World Scientific Publishers
2. Engineering Mathematics-3 By T.K.V.Iyengar and B.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. Pearson Education

Course Outcomes:

- Apply the Frobenius method to obtain a series solution for the given linear 2nd ODE.
- Identify Bessel equation and Legendre equation and solve them under special conditions with the help of series solutions method. Also recurrence relations and orthogonality properties of Bessel and Legendre polynomials.
- After going to through this course the student will be able to analyze a. The complex functions with reference to their analyticity, Integration using Cauchy's integral theorem, b. Find the Taylor's and Laurent series expansion of complex functions
  c. The conformal transformations of complex functions can be dealt with ease.

2014-2015 **Code: 40201**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

II Year B.Tech. ECE-I Sem

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ELECTRICAL CIRCUITS

Course Objective:

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

UNIT –I:

Introduction to Electrical Circuits:

Circuit Concept, R-L-C Parameters, Voltage and Current Sources, Independent and Dependent Sources, Source Transformation, Voltage – Current relationship for Passive Elements (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.

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.

Course Outcome:

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

2014-2015 **Code: 40404**

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SIGNALS AND SYSTEMS

Course Objectives:

- To get an in-depth knowledge about signals, systems and analysis of the same using various transforms.
- Able to generate different types of signals and frequency domain analysis of different signals.
- Able to perform the similarities between two signals in frequency domain.

UNIT-I:

Signal Analysis and Fourier Series

Signal Analysis:

Analogy between Vectors and Signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions, Mean Square Error, Closed or complete set of Orthogonal functions, Orthogonality in Complex functions, Exponential and Sinusoidal signals, Concepts of Impulse function, Unit Step function, Signum function.

Fourier Series:

Representation of Fourier series, Continuous time periodic signals, Properties of Fourier Series, Dirichlet's conditions, Trigonometric Fourier Series and Exponential Fourier Series, Complex Fourier spectrum.

UNIT-II:

Fourier Transforms and Sampling

Fourier Transforms:

Deriving Fourier Transform from Fourier Series, Fourier Transform of arbitrary signal, Fourier Transform of standard signals, Fourier Transform of Periodic Signals, Properties of Fourier Transform, Fourier Transforms involving Impulse function and Signum function, Introduction to Hilbert Transform.

Sampling:

Sampling theorem – Graphical and analytical proof for Band Limited Signals, Typers of Sampling - Impulse Sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, Effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT-III:

Signal Transmission Through Linear Systems

Linear System, Impulse response, Response of a Linear System, Linear Time Invariant (LTI) System, Linear Time Variant (LTV) System, Transfer function of a LTI system, Filter characteristics of Linear Systems, Distortion less transmission through a system,

Convolution and Correlation of Signals

Concept of convolution in Time domain and Frequency domain, Graphical representation of Convolution, Convolution property of Fourier Transforms, Cross Correlation and Auto Correlation of functions, Properties of Correlation function, Energy density spectrum, Parseval's Theorem, Detection of periodic signals in the presence of Noise by Correlation, Extraction of signal from noise by filtering.

UNIT-IV:

Laplace Transforms:

Review of Laplace Transforms (L.T), Partial fraction expansion, Inverse Laplace Transform, Concept of Region of Convergence (ROC) for Laplace Transforms, Constraints on ROC for various classes of signals, Properties of L.T, Relation between L.T and F.T of a signal, Laplace Transform of certain signals using waveform synthesis.

UNIT-V

Z–Transforms:

Fundamental difference between Continuous and Discrete time signals, Discrete time signal representation using Complex exponential and Sinusoidal components, Periodicity of Discrete time signal using complex exponential signal, Concept of Z- Transform of a Discrete Sequence, Distinction between Laplace, Fourier and Z Transforms, Region of Convergence in Z-Transform, Constraints on ROC for various classes of signals, Inverse Z-transform, Properties of Z-transforms.

TEXT BOOKS:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, 2 Ed., PHI.

REFERENCE BOOKS:

1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2 Ed.
2. Signals and Signals – Iyer and K. Satya Prasad, Cengage Learning
3. Signals and Systems – A.Rama Krishna Rao – 2008, TMH.
4. Introduction to Signal and System Analysis – K.Gopalan 2009, Cengage Learning.
5. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.
6. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, 3 Ed., 2004, PE.

Course Outcomes:

- Represent any arbitrary signals in terms of complete sets of orthogonal functions and understands the principles of impulse functions, step function and signum function.
- Express periodic signals in terms of Fourier series and express the spectrum and express the arbitrary signal (discrete) as Fourier transform to draw the spectrum.
- Understands the principle of linear system, filter characteristics of a system and its bandwidth, the concepts of auto correlation and cross correlation and power Density Spectrum.

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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

2014-2015 **Code: 40406**

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

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BASIC SIMULATION LAB

1.Basic Operations on Matrices.

2.Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit impulses, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.

3.Operation of Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.

4.Finding the Even and Odd parts of Signal Sequence and Real and Imaginary parts of Signal.

5.Convolution between Signals and Sequences.

6.Auto Correlation and Cross Correlation between signals and Sequences.

7.Verification of linearity and Time Invariance Properties of a given Continuous/ Discrete System.

8.Computation of unit Sample, Unit Step and sinusoidal responses of the given LTI System and Verifying its Physical reliability and stability Properties.

9.Gibbs Phenomenon.

10.Finding the Fourier Transform of a given Signal and Plotting its magnitude and Phase Spectrum.

11.Waveform Synthesis using Laplace Transform.

12.Locating the Zeros and Poles and Plotting the Pole-Zero maps in S plane and Z-plane for the given Transfer Function.

13.Generation of Gaussian Noise (Real and Complex), Computation of its mean, M.S.Value and its skew, kurtosis, and PSD, probability Distribution function.

14.Sampling Theorem Verification.

15.Removal of noise by Autocorrelation/ Cross Correlation.

16.Extraction of Periodic Signal masked by noise using Correlation.

17.Verification of Weiner-Khinchine Relations

18.Checking a Random Process for Stationary in wide sense.

2014-2015 **Code: 40228**

MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. ECE-II Sem

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PRINCIPLES OF ELECTRICAL ENGINEERING

Course Objectives:

- This course introduces the basic concepts of transient analysis of the circuits, the basic two-port network parameters and the design analysis of filters and attenuators and their use in circuit theory.
- The emphasis of this course is laid on the basic operation of the DC machines and transformers which includes DC generators and motors, single-phase transformers.

UNIT –I:

Transient Analysis (First and Second Order Circuits):

Transient Response of RL , RC Series, RLC Circuits for DC excitations, Initial Conditions, Solution using Differential Equations approach and Laplace Transform Method.

UNIT –II:

Two Port Networks:

Impedance Parameters, Admittance Parameters, Hybrid Parameters, Transmission (ABCD) Parameters, Conversion of one Parameter to another, Conditions for Reciprocity and Symmetry, Interconnection of Two Port networks in Series, Parallel and Cascaded configurations, Image Parameters, Illustrative problems.

UNIT –III:

Filters and Symmetrical Attenuators:

Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristic Impedance in the Pass and Stop Bands, Constant-k Low Pass Filter, High Pass Filter, m-derived T-Section, Band Pass filter and Band Elimination filter, Illustrative Problems. Symmetrical Attenuators – T-Type Attenuator, π–Type Attenuator, Bridged T type Attenuator, Lattice Attenuator.

UNIT –IV:

DC Machines:

Principle of Operation of DC Machines, EMF equation, Types of Generators, Magnetization and Load Characteristics of DC Generators. DC Motors, Types of DC Motors, Characteristics of DC Motors, Losses and Efficiency, Swinburne's Test, Speed Control of DC Shunt Motor, Flux and Armature Voltage control methods.

UNIT –V:

Transformers and Their Performance:

Principle of Operation of Single Phase transformer, Types, Constructional Features, Phasor Diagram on No Load and Load, Equivalent Circuit, Losses and Efficiency of Transformer and Regulation, OC and SC Tests (Simple Problems). Synchros, Stepper Motors.

TEXT BOOKS:

1. Electric Circuits - A. Chakrabarhty, Dhanipat Rai & Sons.
2. Basic concepts of Electrical Engineering - PS Subramanyam, BS Publications

REFERENCE BOOKS:

1. Engineering circuit analysis - William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 7^{th} Edition.
2. Basic Electrical Engineering - S.N. Singh, PHI.
3. Electrical Circuits - David A.Bell, Oxford University Press.
4. Electric Circuit Analysis - K.S.Suresh Kumar, Pearson Education.

Course Outcome:

- After going through this course the student gets a thorough knowledge on transient analysis of circuits, filters, attenuators.
- The operation of DC machines and transformers, with which he/she can able to apply the above conceptual things to real-world problems and applications

2014-2015 **Code:40407**

MALLA REDDY ENGINEERING COLLEGE
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PULSE AND DIGITAL CIRCUITS

Course Objectives:

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

UNIT - I

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, attenuators, RL and RLC circuits and their response for step input, ringing circuit.

UNIT - II

STEADY STATE SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, diode switching times, temperature variation of saturation parameters, design of transistor as a switch, transistor-switching times, transistor in saturation.

NON-LINEAR WAVE SHAPING: Diode clippers, transistor clippers, clipping at two independent levels, emitter coupled clipper, comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage.

UNIT - III

BISTABLE MULTIVIBRATORS: The stable state of a bistable multivibrator, design and analysis of fixed bias and self biased bistable multivibrator, emitter coupled bistable multivibrator, direct binary, and Schmitt trigger circuit using transistors.

MONOSTABLE AND ASTABLE MULTIVIBRATORS: Monostable multivibrator, design and analysis of collector coupled and emitter coupled monostable multivibrator, triggering of monostable multivibrator, astable multivibrator, collector coupled and emitter coupled astable multivibrator.

UNIT - IV

TIME BASE GENERATORS: General features of a time base signal, methods of generating time base waveform and errors, miller and bootstrap time base generators – basic principles, transistor miller time base generator, transistor bootstrap time base generator, current time base generators, methods of linearity improvements.

SYNCHRONIZATION AND FREQUENCY DIVISION: Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, monostable relaxation circuits, synchronization of a sweep circuit with symmetrical signals, sine wave frequency division with a sweep circuit

UNIT - V

SAMPLING GATES: Basic operating principles of sampling gates, Unidirectional diode gate, Bi-directional sampling gates using transistors, Reduction of pedestal in gate circuit, four diode sampling gate, an alternate form of four diode gate, six diode sampling gate, , Chopper Amplifier, Sampling Scope.

LOGIC FAMILIES: Realization of Logic Gates (OR, AND, NOT) Using Diodes & Transistors, DCTL, RTL, DTL, TTL, ECL, CML, CMOS logic family and comparison of logic families.

TEXT BOOKS:

1. Jacob Millman, Herbert Taub, Mothiki S. Prakash Rao (2008), *Pulse, Digital and Switching Waveforms*, 3rd edition, Tata McGraw Hill, New Delhi.
2. Anand Kumar (2005), *Pulse and Digital Circuits*, Prentice Hall of India, India.

REFERENCE BOOKS:

1. David A. Bell (2002), *Solid state pulse circuits*, 4th edition, Prentice Hall of India, New Delhi, India.
2. Mothiki S. Prakash Rao (2006), *Pulse and Digital Circuits*, Tata McGraw Hill, India.

Outcomes:

- Understand the applications of diode as integrator, differentiator, clippers, clampler circuits..
- Learn various switching devices such as diode, transistor, SCR.
- Difference between logic gates and sampling gates
- Design mutivibrators for various applications, synchronization techniques and sweep circuits.
- Realizing logic gates using diodes and transistors.

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MALLA REDDY ENGINEERING COLLEGE
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ELECTROMAGNETIC THEORY AND TRANSMISSION LINES

Course Objectives:

- To introduce the student to the fundamental theory and concepts of electromagnetic waves and transmission lines, and their practical applications.
- To study the propagation, reflection, and transmission of plane waves in bounded and unbounded media.

UNIT–I:

Electrostatics: Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Illustrative Problems. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.

UNIT–II:

Magnetostatics: Biot-Savart's Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy, Illustrative Problems.

Maxwell's Equations (Time Varying Fields): Faraday's Law and Transformer EMF, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements, Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric-Conductor Interfaces, Illustrative Problems .

UNIT–III:

EM Wave Characteristics - I: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H, Sinusoidal Variations, Wave Propagation in Lossless and Conducting Media, Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics, Polarization, Illustrative Problems.

EM Wave Characteristics – II: Reflection and Refraction of Plane Waves – Normal and Oblique Incidences for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor., Illustrative Problems.

UNIT–IV:

Transmission Lines - I: Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion – Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading, Illustrative Problems.

UNIT–V:

Transmission Lines – II: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; $\lambda/4$, $\lambda 2$, $\lambda/8$ Lines – Impedance Transformations, Significance of Z_{min} and Z_{max} , Smith Chart – Configuration and Applications, Single and Double Stub Matching, Illustrative Problems.

TEXT BOOKS:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, 4thEd., Oxford Univ.Press.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, 2ndEd., 2000, PHI.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan, 2001, (Tech. India Publications), New Delhi.

REFERENCE BOOKS:

1. Engineering Electromagnetics – Nathan Ida, 2ndEd., 2005, Springer (India) Pvt. Ltd., New Delhi.
2. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, 7thEd., 2006, TMH.
3. Electromagnetic Filed Theory and Transmission Lines – G. Sashibhushana Rao, Wiley Inia, 2013.
4. Networks, Lines and Fields – John D. Ryder, 2ndEd., 1999, PHI.

Course Objectives:

- Study time varying Maxwell's equations and their applications in electromagnetic problems.
- Determine the relationship between time varying electric and magnetic field and electromotive force.
- Analyze basic transmission line parameters in phasor domain.
- Use Maxwell s equations to describe the propagation of electromagnetic waves in vacuum.
- Show how waves propagate in dielectrics and lossy media.
- Demonstrate the reflection and refraction of waves at boundaries.
- Explain the basic wave guide operation and parameters.

2014-2015 **Code: 40109**

MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. ECE-II Sem

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ENVIRONMENTAL STUDIES

Course Objectives

- An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences including geo systems, 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, Biomagnifications, 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).

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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.

Course Outcomes

- To enable the students to realize 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

2014-2015 **Code: 40409**

MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. ECE-II Sem

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ELECTRONIC CIRCUIT ANALYSIS

Course Objective:

- To familiarize the student with the analysis and design of basic transistor amplifier circuits and their frequency response characteristics, feedback amplifiers, oscillators, large signal amplifiers and tuned amplifiers
- To demonstrate basic understanding of amplifier operation.
- To analyze amplifier circuits using hybrid model.

UNIT - I

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.

JFET AND MOS FET AMPLIFIERS: Small signal JFET model, common source amplifier, common drain amplifier, common gate amplifier. Basic concepts, MOS Small signal model, Common source amplifier with Resistive load

UNIT – II

MULTISTAGE AMPLIFIERS: Distortion in amplifiers, cascading transistor amplifiers, choice of transistor configuration in a cascade amplifier, band pass of cascaded stages, RC coupled amplifier, transformer coupled amplifier, CE-CC amplifier, Darlington connection, multistage amplifier using JFET.

TRANSISTOR AT HIGH FREQUENCIES: Hybrid-pi (π) common emitter transistor model, hybrid - π conductances and capacitances, validity of hybrid- π model, variation of hybrid – π parameters, Millers theorem and its dual, the CE short circuit current gain, current gain with resistive load, gain-bandwidth product, emitter follower at high frequencies.

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

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 - V

TUNED AMPLIFIERS: Introduction, classification of small signal tuned amplifiers, **s**ingle tuned capacitance coupled amplifier, tapped single tuned capacitance coupled amplifier, **s**ingle tuned inductively coupled amplifier, double tuned amplifier.

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. Robert L. Boylestad, Louis Nashelsky (2006), *Electronic Devices and Circuits Theory*, 9th edition, Pearson/Prentice Hall, India

REFERENCE BOOKS:

1. G. K. Mithall (1998), *Electronic Devices and Circuits*, Khanna Publishers, New Delhi.
2. Jacob Millman, Arvin Grabel (2003), *Microelectronics*, 2nd edition, Tata McGraw Hill, New Delhi.

Course Outcomes:

- Design and analyse the DC bias circuitry of BJT and FET.
- Analyse the different types of amplifiers, operation and its characteristics
  Design circuits like amplifiers, oscillators using the transistors diodes and oscillators

2014-2015 **Code: 40410**

MALLA REDDY ENGINEERING COLLEGE
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II Year B.Tech. ECE-II Sem

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DIGITAL DESIGN USING VERILOG HDL

Course Objectives:

- Designing digital circuits, behavioral and RTL modeling of digital circuits using Verilog HDL, verifying these models, and synthesizing RTL models to standard cell libraries and FPGAs.
- Students gain practical experience by designing, modeling, implementing and verifying several digital circuits

This course aims to provide students with the understanding of the different technologies related to HDLs, construct, compile and execute Verilog HDL programs using provided software tools. Design digital components and circuits that are testable, reusable and synthesizable.

UNIT -I:

Introduction to Verilog HDL: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Function Verification, System Tasks, Programming Language Interface, Module, Simulation and Synthesis Tools

Language Constructs and Conventions: Introduction, Keywords, Identifiers, White space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data types, Scalars and Vectors, Parameters, Operators.

UNIT -II:

Gate Level Modeling: Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tristate Gates, Array of Instances of Primitives, Design of Flip –Flops with Gate Primitives, Delays, Strengths and Construction Resolution, Net Types, Design of Basic Circuit.

Modeling at Dataflow Level: Introduction, Continuous Assignment Structure, Delays and Continuous Assignments, Assignment to Vectors, Operators.

UNIT -III:

Behavioral Modeling: Introduction, Operations and Assignments, Functional Bifurcation, 'Initial' Construct, 'Always' Construct, Assignments with Delays, 'Wait' Construct, Multiple Always Block, Designs at Behavioral Level, Blocking and Non- Blocking Assignments, The 'Case' Statement, Simulation Flow 'If' an 'If-Else' Constructs, 'Assign- De-Assign' Construct, 'Repeat' Construct, for Loop, 'The Disable' Construct, 'While Loop', Forever Loop, Parallel Blocks, 'Force- Release, Construct, Event.

UNIT -IV:

Switch Level Modeling: Basic Transistor Switches, CMOS Switches, Bi Directional Gates, Time Delays With Switch Primitives, Instantiation with 'Strengths' and 'Delays', Strength Contention with Trireg Nets.

System Tasks, Functions and Compiler Directives: Parameters, Path Delays, Module Parameters, System Tasks and Functions, File Based Tasks and Functions, Computer Directives, Hierarchical Access, User Defined Primitives.

UNIT -V:

Sequential Circuit Description: Sequential Models – Feedback Model, Capacitive Model, Implicit Model, Basic Memory Components, Functional Register, Static Machine Coding, Sequential Synthesis

Component Test and Verification: Test Bench- Combinational Circuit Testing, Sequential Circuit Testing, Test Bench Techniques, Design Verification, Assertion Verification.

TEXT BOOKS:

1. T R. Padmanabhan, B Bala Tripura Sundari, Design Through Verilog HDL, Wiley, 2009.
2. Zainalabdien Navabi, Verilog Digital System Design, TMH, 2nd Edition.

REFERENCE BOOKS:

1. Fundamentls of Digital Logic with Veilog Design - Stephen Brown, Zvonkoc Vranesic, TMH, 2nd Edition, 2010.
2. Advanced Digital Logic Design using Verilog, State Machine & Synthesis for FPGA - Sunggu Lee, Cengage Learning, 2012.
3. Verilog HDL – Samir Palnitkar, 2nd Edition, Pearson Education, 2009.
4. Advanced Digital Design with the Verilog HDL – Michel D. Ciletti, PHI, 2009.

Course Outcomes:

- Describe Verilog hardware description languages (HDL).
- Design digital circuits;
- Write behavioral models of digital circuits;
- Write Register Transfer Level (RTL) models of digital circuits;
- Verify behavioral and RTL models;
- Describe standard cell libraries and FPGAs;
- Synthesize RTL models to standard cell libraries and FPGAs;
- Implement RTL models on FPGAs and testing & verification.

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ELECTRONIC CIRCUITS AND PULSE CIRCUITS LAB

List of Experiments (16 experiments to be done):

PART –I: ELCTRONIC CIRCUITS

Minimum eight experiments to be conducted:

I) Design and Simulation in Simulation Laboratory using any Simulation Software (Minimum 6 Experiments):

1. Common Emitter Amplifier
2. Common Source Amplifier
3. Two Stage RC Coupled Amplifier
4. Current shunt and Voltage Series Feedback Amplifier
5. Cascode Amplifier
6. Wien Bridge Oscillator using Transistors
7. RC Phase Shift Oscillator using Transistors
8. Class A Power Amplifier (Transformer less)
9. Class B Complementary Symmetry Amplifier
10. Common Base (BJT) / Common Gate (JFET) Amplifier.

II) Testing in the Hardware Laboratory (Minimum 2 Experiments)

1. Class A Power Amplifier (with transformer load)
2. Class C Power Amplifier
3. Single Tuned Voltage Amplifier
4. Hartley & Colpitt's Oscillators
5. Darlington Pair
6. MOS Common Source Amplifier

Equipment required for the Laboratory:

1. For software simulation of Electronic circuits
   - i) Computer Systems with latest specifications
   - ii) Connected in LAN (Optional)
   - iii) Operating system (Windows XP)
   - iv) Suitable Simulations software

2. For Hardware simulations of Electronic Circuits
   - i) Regulated Power Supply (0-30V)

ii) CRO's
iii)Functions Generators
iv)Multimeters
v) Components

3. Win XP/ Linux etc.

PART –II: PULSE CIRCUITS

Minimum eight experiments to be conducted:

1. Linear Wave Shaping
   a. RC Low Pass Circuit for different time constants
   b. RC High Pass Circuit for different time constants
2. Non-linear wave shaping
   a. Transfer characteristics and response of Clippers:
      i) Positive and Negative Clippers
      ii) Clipping at two independent levels
   b. The steady state output waveform of clampers for a square wave input
      i) Positive and Negative Clampers
      ii) Clamping at reference voltage
3. Comparison Operation of Comparators
4. Switching characteristics of a transistor
5. Design a Bistable Multivibrator and draw its waveforms
6. Design an Astable Multivibrator and draw its waveforms
7. Design a Monostable Multivibrator and draw its waveforms
8. Response of Schmitt Trigger circuit for loop gain less than and greater than one
9. UJT relaxation oscillator
10. The output- voltage waveform of Boot strap sweep circuit
11. The output- voltage waveform of Miller sweep circuit

Equipment required for Laboratories:

1. Regulated Power Supply - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multi Meters

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ELECTRICAL TECHNOLOGY LAB

PART –A:

1. Verification of KVL and KCL.
2. Serial and Parallel Resonance.
3. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
4. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.
5. Two port network parameters – ABCD and h- Parameters
6. Verification of Superposition and Reciprocity theorems.
7. Verification of maximum power transfer theorem.
8. Verification of Thevenin's and Norton's theorems.

PART –B:

1. Magnetization characteristics of D.C. Shunt generator.
2. Swinburne's Test on DC shunt machine.
3. Brake test on DC shunt motor.
4. OC & SC tests on Single-phase transformer.
5. Load Test on Single Phase Transformer.

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

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CONTROL SYSTEMS

Course Objectives:

- In this course it is aimed to introduce to the students the principles and applications of control systems in everyday life.
- The basic concepts of block diagram reduction, time domain analysis solutions to time invariant systems and also deals with the different aspects of stability analysis of systems in frequency domain and time domain.

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 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, 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 Systems Theory and Applications - S.K Bhattacharya, Pearson.
2. Control Systems - N.C.Jagan, BS Publications.

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.
4. Control Systems Engineering - I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers.
5. Control Systems - N.K.Sinha, New Age International (P) Limited Publishers.

Course Outcomes:

- After going through this course the student gets a thorough knowledge on open loop and closed loop control systems, concept of feedback in control systems, mathematical modeling and transfer function derivations of Synchros, AC and DC servo motors,
- Transfer function representation through block diagram algebra and signal flow graphs, time response analysis of different ordered systems through their characteristic equation and time-domain specifications, stability analysis of control systems in S-domain through R-H criteria and root-locus techniques, frequency response analysis through bode diagrams, Nyquist, polar plots
- The basics of state space analysis, design of PID controllers, lag, lead, lag-lead compensators, with which he/she can able to apply the above conceptual things to real-world electrical and electronics problems and applications.

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COMPUTER ORGANIZATION AND OPERATING SYSTEMS

Course Objectives:

- To have a thorough understanding of the basic structure and operation of a digital computer.
- To discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
- To study the different ways of communicating with I/O devices and standard I/O interfaces.
- To study the hierarchical memory system including cache memories and virtual memory.
- To demonstrate the knowledge of functions of operating system memory management scheduling, file system and interface, distributed systems, security and dead locks.
- To implement a significant portion of an Operating System.

UNIT-I:

Basic Structure of Computers: Computer Types, Functional UNIT, Basic OPERATIONAL Concepts, Bus Structures, Software, Performance, Multiprocessors and Multi Computers, Data Representation, Fixed Point Representation, Floating – Point Representation.

Register Transfer Language and Micro Operations: Register Transfer Language, Register Transfer Bus and Memory Transfers, Arithmetic Micro Operations, Logic Micro Operations, Shift Micro Operations, Arithmetic Logic Shift Unit, Instruction Codes, Computer Registers Computer Instructions
– Instruction Cycle.
Memory – Reference Instructions, Input – Output and Interrupt, STACK Organization, Instruction Formats, Addressing Modes, DATA Transfer and Manipulation, Program Control, Reduced Instruction Set Computer.

UNIT -II:

Micro Programmed Control: Control Memory, Address Sequencing, Microprogram Examples, Design of Control Unit, Hard Wired Control, Microprogrammed Control

The Memory System: Basic Concepts of Semiconductor RAM Memories, Read-Only Memories, Cache Memories Performance Considerations, Virtual Memories Secondary Storage, Introduction to RAID.

UNIT -III:

Input-Output Organization: Peripheral Devices, Input-Output Interface, Asynchronous Data Transfer Modes, Priority Interrupt, Direct Memory Access, Input –Output Processor (IOP),

Serial Communication; Introduction to Peripheral Components, Interconnect (PCI) Bus, Introduction to Standard Serial Communication Protocols like RS232, USB, IEEE1394.

UNIT -IV:

Operating Systems Overview: Overview of Computer Operating Systems Functions, Protection and Security, Distributed Systems, Special Purpose Systems, Operating Systems Structures-Operating System Services and Systems Calls, System Programs, Operating Systems Generation

Memory Management: Swapping, Contiguous Memory Allocation, Paging, Structure of The Page Table, Segmentation, Virtual Memory, Demand Paging, Page-Replacement Algorithms, Allocation of Frames, Thrashing Case Studies - UNIX, Linux, Windows

Principles of Deadlock: System Model, Deadlock Characterization, Deadlock Prevention, Detection and Avoidance, Recovery from Deadlock.

UNIT -V:

File System Interface: The Concept of a File, Access Methods, Directory Structure, File System Mounting, File Sharing, Protection.

File System Implementation: File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free-Space Management.

TEXT BOOKS:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, 5th Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, 3rd Edition, Pearson
3. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 8th Edition, John Wiley.

REFERENCE BOOKS:

1. Computer Organization and Architecture – William Stallings 6th Edition, Pearson
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI
3. Fundamentals of Computer Organization and Design - Sivaraama Dandamudi Springer Int. Edition.
4. Operating Systems – Internals and Design Principles, Stallings, 6th Edition–2009, Pearson Education.
5. Modern Operating Systems, Andrew S Tanenbaum 2nd Edition, PHI.
6. Principles of Operating Systems, B.L.Stuart, Cengage Learning, India Edition.

Course Outcomes:

- Basic structure of a digital computer
- Arithmetic operations of binary number system
- The organization of the Control unit, Arithmetic and Logical unit, Memory unit and the I/O unit.
- Operating system functions, types, system calls.
- Memory management techniques and dead lock avoidance
- Operating systems' file system implementation and its interface.

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LINEAR AND DIGITAL IC APPLICATIONS

Course Objectives:

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

UNIT - I

INTEGRATED CIRCUITS 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.

Course Outcomes:

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

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ANTENNAS AND WAVE PROPAGATION

Course Objectives:

- Understand basic terminology and concepts of Antennas.
- To attain knowledge on the basic parameters those are considered in the antenna design process and the analysis while designing that.
- Analyze the electric and magnetic field emission from various basic antennas and mathematical formulation of the analysis.
- To have knowledge on antenna operation and types as well as their usage in real time filed.
- Aware of the wave spectrum and respective band based antenna usage and also to know the propagation of the waves at different frequencies through different layers in the existing layered free space environment structure.

UNIT -I:

Antenna Basics: Introduction, Basic Antenna Parameters – Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures, Effective Height, Illustrative Problems.

Fields from Oscillating Dipole, Field Zones, Front - to-back Ratio, Antenna Theorems, Radiation, Retarded Potentials – Helmholtz Theorem

Thin Linear Wire Antennas – Radiation from Small Electric Dipole, Quarter Wave Monopole and Half Wave Dipole – Current Distributions, Field Components, Radiated Power, Radiation Resistance, Beam Width, Directivity, Effective Area and Effective Height, Natural Current Distributions, Far Fields and Patterns of Thin Linear Centre-fed Antennas of Different Lengths, Illustrative Problems. Loop Antennas - Introduction, Small Loop, Comparison of Far Fields of Small Loop and Short Dipole, Radiation Resistances and Directivities of Small and Large Loops (Qualitative Treatment).

UNIT -II:

VHF, UHF and Microwave Antennas - I : Arrays with Parasitic Elements, Yagi-Uda Array, Folded Dipoles and their Characteristics, Helical Antennas – Helical Geometry, Helix Modes, Practical Design Considerations for Monofilar Helical Antenna in Axial and Normal Modes, Horn Antennas – Types, Fermat's Principle, Optimum Horns, Design Considerations of Pyramidal Horns, Illustrative Problems.

UNIT -III:

VHF, UHF and Microwave Antennas - II: Microstrip Antennas – Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas – Geometry and Parameters, Characteristics of Microstrip Antennas. Impact of Different Parameters on Characteristics,

Reflector Antennas – Introduction, Flar Sheet and Corner Reflectors, Paraboloidal Reflectors – Geometry, Pattern Characteristics, Feed Methods, Reflector Types – Related Features, Illustrative Problems.

Lens Antennas – Introduction, Geometry of Non-metallic Dielectric Lenses, Zoning, Tolerances, Applications.

UNIT -IV:

Antenna Arrays: Point Sources – Definition, Patterns**,** arrays of 2 Isotropic Sources - Different Cases, Principle of Pattern Multiplication, Uniform Linear Arrays – Broadside Arrays, Endfire Arrays, EFA with Increased Directivity, Derivation of their Characteristics and Comparison, BSAs with Non-uniform Amplitude Distributions – General Considerations and Binomial Arrays, Illustrative Problems.

Antenna Measurements: Introduction, Concepts - Reciprocity, Near and Far Fields, Coordinate System, Sources of Errors. Patterns to be Measured, Pattern Measurement Arrangement, Directivity Measurement, Gain Measurements (by Comparison, Absolute and 3-Antenna Methods)

UNIT -V:

Wave Propagation – I: Introduction, Definitions, Categorizations and General Classifications, Different Modes of Wave Propagation, Ray/Mode Concepts, Ground Wave Propagation (Qualitative Treatment) – Introduction, Plane Earth Reflections, Space and Surface Waves, Wave Tilt, Curved Earth Reflections. Space Wave Propagation – Introduction, Field Strength Variation with Distance and Height, Effect of Earth's Curvature, Absorption, Super Refraction, M-Curves and Duct Propagation, Scattering Phenomena, Tropospheric Propagation.

Wave Propagation – II: Sky Wave Propagation – Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and Skip Distance, Multi-hop Propagation.

TEXT BOOKS:

1. Antennas and Wave Propagation – J.D. Kraus, R.J. Marhefka and Ahmad S. Khan, TMH, New Delhi, 4th ed., (Special Indian Edition), 2010.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd ed., 2000.

REFERENCE BOOKS:

1. Antenna Theory - C.A. Balanis, John Wiley & Sons, 3rd Ed., 2005.
2. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
3. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
4. Antennas – John D. Kraus, McGraw-Hill (International Edition), 2nd Ed. 1988.

Course Outcomes:

- Aware of the parameter considerations viz. antenna efficiency, beam efficiency, radiation resistance etc. in the design of an antenna.
- Capable to analyze the designed antenna and field evaluation under various conditions and formulate the electric as well as the magnetic fields Equation set for Far field and near field conditions.
- Understand the Array system of different antennas and filed analysis under application of different currents to the individual antenna elements
- Understand the design issues, operation of fundamental antennas like Yagi-Uda, Horn antennas and helical structure and also their operation methodology in practice.
- Design a lens structure and also the bench setup for antenna parameter measurement of testing for their effectiveness.
- Knowledge about the means of propagation of Electromagnetic wave i.e. free space propagation and also about frequency dependent layer selection, its respective issues for an effective transmission of information in the form of EM wave to a remote location and related issues.

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ANALOG COMMUNICATIONS

Course Objectives:

- Developing and understanding of the design of Analog communication system.
- Study of analog modulation techniques.
- Subject will develop analytical abilities related to Circuit members.
- Establishing a firm foundation for the understanding of telecommunication systems, and the relationship among various technical factors when such systems are designed and operated.

UNIT –I:

Amplitude Modulation

Introduction to communication system, Need for modulation, Frequency Division Multiplexing , Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector, Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.

UNIT –II:

SSB Modulation

Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelope detection of a VSB Wave pulse Carrier, Comparison of AM Techniques, Applications of different AM Systems.

UNIT –III:

Angle Modulation

Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power, Transmission bandwidth of FM Wave - Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM and AM.

UNIT –IV:

Noise in Analog communication System

Types of Noise: Resistive (Thermal) Noise Source, Shot noise, Extraterrestrial Noise, Arbitrary Noise Sources, White Noise, Narrowband Noise- In phase and quadrature phase components and its Properties, Modeling of Noise Sources, Average Noise Bandwidth, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks.

Noise in DSB and SSB System Noise in AM System, Noise in Angle Modulation System, Noise Triangle in Angle Modulation System, Pre-emphasis and de-emphasis

UNIT –V:

Receivers

Radio Receiver - Receiver Types - Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting.

Pulse Modulation

Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM, Time Divison Multiplexing.

TEXTBOOKS:

1. Communication Systems–Simon Haykin, 2 Ed, Wiley Publications.
2. Communication Systems – B.P. Lathi, BS Publication , 2004.

REFERENCE BOOKS:

1. Electronic Communications – Dennis Roddy and John Coolean , 4th Edition,PEA, 2004
2. Analog and Digital Communication – K. Sam Shanmugam, Willey ,2005
3. Communication Systems,Analog & Digital; R Singh, S Sapre Publisher: Tata McGraw-Hill; Place: New Delhi
4. Electronics & Communication System – George Kennedy and Bernard Davis , TMH 2004.
5. Principles of Communication Systems – H Taub & D. Schilling, Gautam Sahe, TMH, 2007 , 3rd Edition

Course Outcomes:

- Conceptually understand the baseband signal & system.
- Identify various elements, processes, and parameters in telecommunication systems, and describe their functions, effects, and interrelationship.
- Design procedure of AM Transmission & Reception, analyze, measure, and evaluate the performance of a telecommunication system against given criteria.
- Understand basic knowledge of FM Transmission & Reception
- Understand various types of SSB Transmission & Reception.
- Design typical telecommunication systems that consist of basic and essential building blocks.

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MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Course Objectives:

- To set objectives for the firm & to analyze Demand, Production, Cost, BEP, Investment, Market & set the prices for maximization of profits.
- To provide knowledge on the principles of financial and management accounts as applicable to real life business situations by determine profits, assets, liabilities & performance of a firm through simple problems.
- To start enterprise & estimate sources of capital and their implication to the business.

UNIT –I:

Introduction & Demand Analysis:

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.

UNIT –II:

Production & 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. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems) - Managerial Significance.

UNIT –III:

Markets & New Economic Environment:

Types of competition and Markets, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing: Objectives and Policies of Pricing. Methods of Pricing. Business:Features and evaluation of different forms of Business Organisation: Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types,New Economic Environment: Changing Business Environment in Post-liberalization scenario.

UNIT –IV:

Capital Budgeting:

Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising capital - Trading Forecast, Capital Budget, Cash Budget. Capital Budgeting: features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems).

UNIT –V:

Introduction to Financial Accounting & Financial Analysis:

Accounting concepts and Conventions - Introduction IFRS - Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).Financial Analysis**:** Analysis and Interpretation of Liquidity Ratios, Activity Ratios, and Capital structure Ratios and Profitability ratios. Du Pont Chart.

TEXT BOOKS:

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2012.
2. Vijay Kumar & Appa Rao, Managerial Economics & Financial Analysis, Cengage 2011.
3. J. V. Prabhakar Rao & P.V. Rao, Managerial Economics & Financial Analysis, Maruthi Publishers, 2011.

REFERENCE BOOKS:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.2012.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, Pearson, 2012.
3. Lipsey & Chrystel, Economics, Oxford University Press, 2012
4. Domnick Salvatore: Managerial Economics in a Global Economy, Thomson, 2012.
5. Narayanaswamy: Financial Accounting—A Managerial Perspective, Pearson, 2012.
6. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2012.
7. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2012.
8. Dwivedi: Managerial Economics, Vikas, 2012.
9. Kasi Reddy, Saraswathi, MEFA, PHI Learning, 2012.
10. Shailaja & Usha : MEFA, University Press, 2012.

Course Outcomes:

- Able to set objectives for the firm & to analyze Demand, Production, Cost, BEP, Investment, Market & set the prices for maximization of profits.
- Able to start enterprise & estimate sources of capital and their implication to the business.
- To provide knowledge on the principles of financial and management accounts as applicable to real life business situations by determine profits, assets, liabilities & performance of a firm through simple problems.
- Provide knowledge to assess the financial Strengths and weaknesses of a firm through Ratio Analysis

2014-2015 **Code: 40415**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-I Sem

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ANALOG COMMUNICATIONS LAB

Note:

- Minimum 12 experiments should be conducted(First three experiments are compulsory):
- All these experiments are to be simulated first either using MATLAB, or any other simulation package and then to be realized in hardware

1.Amplitude modulation and demodulation

2.DSB-SC Modulator & Detector

3.SSB-Sc Modulator & Detector (Phase Shift Method)

4.Frequency modulation and demodulation.

5.Study of spectrum analyzer and analysis of AM and FM Signals

6.Pre-emphasis & de-emphasis.

7.Time Division Multiplexing & De multiplexing

8.Frequency Division Multiplexing & De multiplexing

9.Verification of Sampling Theorem

10.Pulse Amplitude Modulation & Demodulation

11.Pulse Width Modulation & Demodulation

12.Pulse Position Modulation & Demodulation

13.Frequency Synthesizer.

14.AGC Characteristics.

15.PLL as FM Demodulator

Equipment required for the Laboratory:

1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. RF Generators - 0 – 1000 M Hz./0 – 100 M Hz.
5. Multimeters
6. Lab Experimental kits for Analog Communication
7. Components
8. Radio Receiver/TV Receiver Demo kits or Trainees.
9. Spectrum Analyzer - 60 M Hz.
10. Any one simulation package

2014-2015 **Code: 40416**

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

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Linear and Digital IC Applications Lab

MINIMUM TWELVE EXPERIMENTS MUST CONDUCT: (Six from each part A & B)
PART -A: TO VERIFY THE FOLLOWING FUNCTIONS

1. Adder, Subtractor, Comparator Circuits using IC 741 OP AMP .
2. Integrator and Differentiator Circuits using IC 741 OP AMP.
3. Active Low pass, High pass Butterworth (Second Order).
4. RC Phase Shift and Wien Bridge Oscillators using IC 741 Op-Amp.
5. IC 555 Timers – Monostable Operation Circuits.
6. Schmitt Trigger Circuits – using IC 741 and IC 555.
7. IC 565 –PLL applications
8. Voltage Regulator using IC 723,Three terminal voltage regulators 7805,7809, 7912
9. Sample and Hold LF398 IC

PART -B: TO VERIFY THE FOLLOWING FUNCTIONALITY Of the following 74 series TTL ICS

1. D-Flip Flop (74LS74) and JK Master Slave Flip-flop(74LS73)
2. Decade counter (74LS90) and Up-down Counter (74LS192)
3. Universal shift Register(74LS194/195)
4. 3-8 Decoder using (74LS138).
5. 4 – bit comparator (74LS85)
6. 8x1 Multiplexer - 74LS151 and 2x4 DeMultiplexer-74155.
7. RAM 16X4 -74189(read and write operation)
8. Stack and queue implementation using RAM, 74189.

Equipment required for Laboratories:

1. RPS
2. CRO
3. Function Generator
4. Multi Meters
5. Bread Boards
6. Components:- IC741, IC555, IC566, IC1496, IC723, 7805, 7809, 7912 and other essential components.
7. Analog IC Tester

2014-2015 **Code: 40417**

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

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DIGITAL COMMUNICATIONS

Course Objectives:

- To understand different digital modulation techniques such as PCM, DM and various shift keying techniques.
- Understand the concepts of different digital modulation techniques.
- To study about different error detecting and error correcting codes like block codes, cyclic codes and convolution codes
- To study the advantages of spread spectrum techniques and performance of spread spectrum, PN codes in jamming, noise etc.

UNIT -I:

Elements of Digital Communication Systems:

Advantages of Digital Communication Systems, Bandwidth-S/N Tradeoff, Hartley Shanon Law and Sampling Theorem.

Pulse Code Modulation: PCM Generation and Reconstruction, Quantization Noise, Non Uniform Quantization and Companding, DPCM, Adaptive DPCM, DM and Adaptive DM, Noise in PCM and DM.

UNIT -II:

Digital Modulation Techniques: Introduction, ASK,ASK Modulator, Coherent ASK Detector, Non-Coherent ASK Detector, FSK, Bandwidth and Frequency Spectrum FSK, Non Coherent FSK Detector, Coherent FSK Detector, FSK Detection using PLL, BPSK, Coherent PSK Detection, QPSK, Differential PSK.

UNIT -III:

Baseband Transmission and Optimal Reception of Digital Signal: Pulse Shaping for Optimum Transmissions, A Baseband Signal Receiver, Probability of Error, Optimum Receiver, Optimal of Coherent Reception, Signal Space Representation and Probability of Error and Eye Diagrams for ASK, PSK, FSK, Cross Talk.

Information Theory: Information and entropy, conditional entropy and redundancy, Shannon Fano coding, Mutual Information, Information loss due to noise, source codings – Huffman Code, variable length coding, Source coding to Increase average Information per bit, Lossy source coding.

UNIT -IV:

Error Control Codes

Linear Block Codes: Matrix Description of Linear Block Codes, Error Detection and Error Correction Capabilities of Linear Block Codes.

Cyclic Codes: Algebraic Structure, Encoding, Syndrome Calculation, Decoding.

Convolution Codes: Encoding, Decoding using State, Tree and Trellis Diagrams, Decoding using Viterbi Algorithm, Comparison of Error Rates in Coded and Uncoded Transmission.

UNIT -V:

Spread Spectrum Modulation: Use of Spread Spectrum, Direct Sequence Spread Spectrum (DSSS), Code Division Multiple Access, Ranging using DSSS, Frequency Hopping Spread Spectrum, PN - Sequences: Generation and Characteristics, Synchronization in Spread Spectrum Systems

TEXT BOOKS:

1.Principles of Communication Systems - Herbert Taub, Donald L Schiling, Goutam Saha, 3rd Edition, Mcgraw-Hill, 2008.
2.Digital and Analog Communication Systems – Sam Shanmugam, John Wiley, 2005.
3.Digital Communication – Simon Haykin, John Wiley, 2005.

REFERENCE BOOKS:

1.Digital Communications – John G. Proakis , Masoud Salehi – 5th Edition, Mcgraw-Hill, 2008.
2.Digital Communications – Ian A. Glover, Peter M. Grant, 2nd Edition, Pearson Edu., 2008.
3.Communication Systems – B.P. Lathi, BS Publication, 2006.
4.A First course in Digital Communications -Nguyen, Shewedyh, Cambride.
5.Digital Communication- Theory, Techniques, and Applications _ R. N. Mutagi, 2nd Ed. 2013.

Course Outcomes:

- Understand basic components of digital communication systems.
- Design optimum receivers for digital modulation techniques.
- Analyze the error performance of digital modulation techniques.
- Know about different error detecting and error correcting codes like block codes, cyclic codes and convolution codes.
- Understand the advantages of spread spectrum techniques and performance of spread spectrum, PN codes in jamming, noise etc.

2014-2015 **Code: 40418**

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

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DIGITAL SIGNAL PROCESSING

Course Objectives:

- To provide background and fundamental material for the analysis and processing of digital signals.
- To familiarize the relationships between continuous-time and discrete-time signals and systems.
- To study fundamentals of time, frequency and Z-plane analysis and to discuss the inter-relationships of these analytic method.
- To study the designs and structures of digital (IIR 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

Course Outcomes:

- Perform time, frequency and Z -transform analysis on signals and systems.
- Understand the inter-relationship between DFT and various transforms.
- Understand the significance of various filter structures and effects of roundoff errors.
- Design a digital filter for a given specification.
- Understand the fast computation of DFT and appreciate the FFT processing.
- Understand the tradeoffs between normal and multi rate DSP techniques and finite length word effects.

2014-2015 **Code: 40419**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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MICROPROCESSORS AND MICROCONTROLLERS

Course Objective:

- To develop an in-depth understanding of the operation of microprocessors and microcontrollers, machine language programming & interfacing techniques.
- To design and develop Microprocessor/ microcontroller based systems for real time applications using low level language like ALP.
- To understand the basics of microprocessors and microcontrollers architectures and its functionalities

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

Course Outcome:

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

2014-2015 **Code: 40420**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

Course Objectives:

- An introduction to measurement techniques and instrumentation design and operation.
- The basic concept of units, measurement error and accuracy, the construction and design of measuring devices and circuits, measuring instruments and their proper applications.
- To use different measuring techniques and the measurement of different physical parameters using different transducers.

UNIT -I:

Block Schematics of Measuring Systems: Performance Characteristics, Static Characteristics, Accuracy, Precision, Resolution, Types of Errors, Gaussian Error, Root Sum Squares formula, Dynamic Characteristics, Repeatability, Reproducibility, Fidelity, Lag ;Measuring Instruments: DC Voltmeters, D' Arsonval Movement, DC Current Meters, AC Voltmeters and Current Meters, Ohmmeters, Multimeters, Meter Protection, Extension of Range, True RMS Responding Voltmeters, Specifications of Instruments.

.**UNIT -II:**

Signal Analyzers: AF, HF Wave Analyzers, Harmonic Distortion, Heterodyne wave Analyzers, Spectrum Analyzers, Power Analyzers, Capacitance-Voltage Meters, Oscillators. Signal Generators: AF, RF Signal Generators, Sweep Frequency Generators, Pulse and Square wave Generators, Function Generators, Arbitrary Waveform Generator, Video Signal Generators, and Specifications

UNIT -III:

Oscilloscopes: CRT, Block Schematic of CRO, Time Base Circuits, Lissajous Figures, CRO Probes, High Frequency CRO Considerations, Delay lines, Applications: Measurement of Time, Period and Frequency Specifications.

Special Purpose Oscilloscopes: Dual Trace, Dual Beam CROs, Sampling Oscilloscopes, Storage Oscilloscopes, Digital Storage CROs.

UNIT -IV:

Transducers: Classification, Strain Gauges, Bounded, unbounded; Force and Displacement Transducers, Resistance Thermometers, Hotwire Anemometers, LVDT, Thermocouples, Synchros, Special Resistance Thermometers, Digital Temperature sensing system, Piezoelectric Transducers, Variable Capacitance Transducers, Magneto Strictive Transducers.

UNIT -V:

Bridges: Wheat Stone Bridge, Kelvin Bridge, and Maxwell Bridge.

Measurement of Physical Parameters: Flow Measurement, Displacement Meters, Liquid level Measurement, Measurement of Humidity and Moisture, Velocity, Force, Pressure – High Pressure, Vacuum level, Temperature -Measurements, Data Acquisition Systems.

TEXT BOOKS:

1. Modern Electronic Instrumentation and Measurement Techniques: A.D. Helbincs, W.D. Cooper: PHI 5th Edition 2003.
2. Electronic Instrumentation: H.S.Kalsi – TMH, 2nd Edition 2004.

REFERENCE BOOKS:

1. Electronic Instrumentation and Measurements – David A. Bell, Oxford Univ. Press, 1997.
2. Electronic Measurements and Instrumentation: B.M. Oliver, J.M. Cage TMH Reprint 2009.
3. Measurement Systems – Ernest O. Doebelin and Dhanesh N Manik, 6th Ed., TMH,
4. Electronic Measurements and Instrumentation – K. Lal Kishore, Pearson Education 2010.
5. Industrial Instrumentation: T.R. Padmanabham Springer 2009.

Course Outcomes:

- Describe the fundamental concepts and principles of instrumentation.
- Explain the operations of the various instruments required in measurements.
- Apply the measurement techniques for different types of tests.
- To select specific instrument for specific measurement function.
- Understand principle of operation, working of different electronic instruments like digital multi meter, vector voltmeter.
- Learners will apply knowledge of different oscilloscopes like CRO, DSO.
- Students will understand functioning, specification, and applications of signal analyzing instruments.

2014-2015 **Code: 40B02**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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MANAGEMENT SCIENCE

Course Objectives:

- To study functional areas of management to provide a student with conceptual framework and theory underlying organizational behavior.
- To provide basic knowledge of Human Resources management, marketing management, production and operation management, corporate strategies and contemporary management for an effective decision making.

UNIT -I:

Introduction to Management & Organisation:

Concepts of Management and organization- nature, importance and Functions of Management, Systems Approach to Management - Taylor's Scientific Management Theory – Fayal's Principles of Management – Maslow's theory of Hierarchy of Human Needs – Douglas McGregor's Theory X and Theory Y – Hertzberg Two Factor Theory of Motivation - Leadership Styles, Social responsibilities of Management. Designing Organisational Structures: Basic concepts related to Organisation - Departmentation and Decentralisation, Types and Evaluation of mechanistic and organic structures of organisation and suitability.

UNIT -II:

Operations & Marketing Management:

Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement – Business Process Reengineering (BPR) - Statistical Quality Control: control charts for Variables and Attributes (simple Problems) and Acceptance Sampling, TQM, Six Sigma, Deming's contribution to quality. Objectives of Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records – JIT System, Supply Chain Management, Functions of Marketing, Marketing Mix, and Marketing Strategies based on Product Life Cycle, Channels of distribution.

UNIT -III:

Human Resources Management (HRM):

Concepts of HRM, HRD and Personnel Management and Industrial Relations (PMIR), HRM vs PMIR, Basic functions of HR Manager: Manpower planning, Recruitment, Selection, Training and Development, Placement, Wage and Salary Administration, Promotion, Transfer, Separation, Performance Appraisal, Grievance Handling and Welfare Administration, Job Evaluation and Merit Rating – Capability Maturity Model (CMM) Levels – Performance Management System.

UNIT -IV:

Project Management (PERT/CPM):

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

UNIT -V:

Strategic Management and Contemporary Strategic Issues:

Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps in Strategy Formulation and Implementation, Generic Strategy alternatives. Bench Marking and Balanced Score Card as Contemporary Business Strategies.

TEXT BOOKS:

1. Aryasri: Management Science, McGraw Hill, 2012.
2. Vijay Kumar and Appa Rao, Management Science, Cengage, 2012.

REFERENCE BOOKS:

1. Kotler Philip & Keller Kevin Lane: Marketing Management, Pearson, 2012.
2. Koontz & Weihrich: Essentials of Management, McGraw Hill, 2012.
3. Thomas N.Duening & John M.Ivancevich Management—Principles and
1. Guidelines, Biztantra, 2012.
4. Kanishka Bedi, Production and Operations Management, Oxford University
2. Press, 2012.
5. Samuel C.Certo: Modern Management, 2012.
6. Schermerhorn, Capling, Poole & Wiesner: Management, Wiley, 2012.
7. Parnell: Strategic Management, Cengage,2012.
8. Lawrence R Jauch, R.Gupta &William F.Glueck: Business Policy and Strategic Management, Frank Bros.2012.

Course Outcomes:

- Able to study functional areas of management to provide a student with conceptual framework and theory underlying organizational behavior.
- Able to provide basic knowledge of Human Resources management, marketing management, production and operation management, corporate strategies and contemporary management for an effective decision making.

2014-2015 **Code: 40B04**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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HUMAN VALUES AND PROFESSIONAL ETHICS
(Open Elective)

Course Objectives

- To make students familiar with Human value with professional ethics.
- To understand values which can enhance human well-being of the society
- 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), Trademarks, 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 & behavior, respect for authority, responsibility, accountability, confidentiality etc..

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.
5. R.K.Shukla, Anuranjan Mishra,"Human Values and Professional Ethics" Published by A.B.Publication.

Course Outcomes:

- Able to define various terms related to Human value with professional ethics..
- Able to understand the professional responsibilities.
- Able to analyze the soft ware engineering ethics and practices..

2014-2015 **Code: 401A1**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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DISASTER MANAGEMENT
(Open Elective)

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 analyze 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 institution

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

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

Course Outcomes

- Capacity to integrate knowledge and to analyze, evaluate and manage the different public health aspects of disaster events at a local and global levels.
- Capacity to describe, analyze and evaluate the environmental, social, cultural, economic, legal and organizational 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, analyze, 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.

2014-2015 **Code: 40B05**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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INTELLECTUAL PROPERTY RIGHTS
(Open Elective)

Course Objectives:

- To make students familiar with Intellectual Property Rights.
- To understand innovations in engineering and other domains.
- 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.

Course Outcomes:

- To define various terms related to Intellectual Property Rights.
- To understand the process of patent, copyrights and related procedures.
- To analyze the situation of IPR in the Indian context with that of global scenario.
- To understand the patenting process through various case studies

2014-2015 **Code: 40421**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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MICROPROCESSORS AND MICROCONTROLLERS LAB

Note:

- Minimum of 12 experiments are o be conducted.
- The Following programs/experiments are to be written for assembler and to be executed the same with 8086 and 8051 kits.

List of Experiments:

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors 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.

2014-2015 **Code: 40422**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

L	T/P/D	C
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DIGITAL SIGNAL PROCESSING LAB

Note:

- Minimum of 12 experiments are to be conducted.
- The programs shall be implemented in software (Using MATLAB / Lab view / C programming/OCTAVE Equivalent) and hardware (Using TI / Analog devices / Motorola / Equivalent DSP processors).

List of Experiments:

1. Generation of Sinusoidal waveform / signal based on recursive difference equations
2. To find frequency response of a given system given in (Transfer Function/Differential Equation)
3. To find DFT / ID FT of given DT signal
4. Linear convolution using DFT and IDFT method
5. Circular convolution
6. Implementation of FFT of given sequence
7. Determination of Power Spectrum of a given signal(s).
8. Implementation of LP FIR filter for a given sequence
9. Implementation of HP FIR filter for a given sequence
10. Implementation of LP IIR filter for a given sequence
11. Implementation of HP IIR filter for a given sequence
12. Generation of Sinusoidal signal through filtering
13. Generation of DTMF signals
14. Implementation of Decimation Process
15. Implementation of Interpolation Process
16. Implementation of I/D sampling rate converters
17. Audio application such as to plot a time and frequency display of microphone plus a cosine using DSP. Read a .wav file and match with their respective spectrograms.
18. Noise removal: Add noise above 3 KHz and then remove, interference suppression using 400 Hz tone.

2014-2015 **Code: 40E07**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

III Year B.Tech. ECE-II Sem

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ADVANCED COMMUNICATION SKILLS (ACS) 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

2014-2015 **Code: 40516**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

IV Year B.Tech. ECE-I Sem

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COMPUTER NETWORKS

Course Objectives:

- An understanding the evolution of early networks and the Internet.
- The capability to express the Fundamentals of networks and the problems involved in the networks.
- The ability to express the Fundamental functionality of the layers and protocols involved with the case study like UDP, TCP, HTTP.
- Demonstrating the ability to use effectively a range of common networked applications.

UNIT-I:

Introduction to Networks: Internet, Protocols and Standards, The OSI Model, Layers in OSI Model, TCP/IP Suite, Addressing.

Physical Layer: Multiplexing, Transmission Media, Circuit Switched Networks, Datagram Networks, and Virtual Circuit Networks.

UNIT-II:

Data Link Layer: Introduction, Checksum, Framing, Flow and Error Control, Noiseless Channels, Noisy Channels, HDLC, Point to Point Protocols.

Medium Access Sub Layer: Random Access Controlled Access, Channelization, IEEE Standards, Ethernet, Fast Ethernet, Giga-Bit Ethernet, Wireless LANs.

UNIT-III:

Network Layer: Logical Addressing, Internetworking, Tunneling, Address Mapping, ICMP, IGMP, Forwarding, Uni-Cast Routing Protocols, Multicast Routing Protocols.

UNIT-IV:

Transport Layer: Process to Process Delivery, UDP and TCP Protocols, SCTP, Data Traffic, Congestion, Congestion Control, QoS, Integrated Services, Differentiated Services, QoS in Switched Networks.

UNIT-V:

Application Layer: Domain Name Space, DNS in Internet, Electronic Mail, FTP, WWW, HTTP, SNMP, Multi-Media, Network Security.

TEXT BOOKS:

1. Data Communications and Networking – Behrouz A. Forouzan, Fifth Edition TMH, 2013.
2. Computer Networks -- Andrew S Tanenbaum, 4th Edition, Pearson Education.

REFERENCE BOOKS:

1. An Engineering Approach to Computer Networks - S. Keshav, 2nd Edition, Pearson Education
2. Understanding Communications and Networks, 3rd Edition, W.A.Shay, Cengage Learning.
3. Computer and Communication Networks - Nader F. Mir, Pearson Education
4. Computer Networking: A Top-Down Approach Featuring the Internet - James F.Kurose, K.W.Ross, 3rd Edition, Pearson Education.
5. Data and Computer Communications - G. S. Hura and M. Singhal, CRC Press, Taylor and Francis Group.

Course Outcomes:

- Explain the hierarchical, layered structure of typical network architecture.
- Perform Data correction and error detection techniques due to problems in the medium.
- Explain Peer link protocols like Stop and wait HDLC and PPP.
- Improving the performance in MAC using techniques like Random access and controlled access etc.
- Explain the Theory involved in the switching and enhancing the media usage.

2014-2015 **Code: 40423**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

IV Year B.Tech. ECE-I Sem

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MICROWAVE ENGINEERING

Course Objectives:

- To develop the knowledge on transmission lines for microwaves, cavity resonators and wave guide components and applications.
- To enable the students understand and analyze the operation of Microwave tubes like klystron, magnetron, travelling wave tube, etc.,
- To familiarize with microwave solid state devices.
- To understand the scattering matrix parameters and its use.
- To introduce the student the microwave test bench for measure different parameters like attenuation, VSWR, etc.,

UNIT-I:

Microwave Transmission Lines - I: Introduction, Microwave Spectrum and Bands, Applications of Microwaves. Rectangular Waveguides – Solution of Wave Equations in Rectangular Coordinates, TE/TM mode analysis, Expressions for Fields, Characteristic Equation and Cut-off Frequencies, Filter Characteristics, Dominant and Degenerate Modes, Sketches of TE and TM mode fields in the cross-section, Mode Characteristics – Phase and Group Velocities, Wavelengths and Impedance Relations, Illustrative Problems.

Rectangular Guides: Power Transmission and Power Losses, Impossibility of TEM Mode, Micro strip Lines– Introduction, Z_o Relations, Effective Dielectric Constant, Losses, Q factor.

UNIT-II:

Cavity Resonators– Introduction, Rectangular Cavities, Dominant Modes and Resonant Frequencies, Q Factor and Coupling Coefficients, Illustrative Problems

Waveguide Components and Applications: Coupling Mechanisms – Probe, Loop, Aperture types. Waveguide Discontinuities – Waveguide Windows, Tuning Screws and Posts, Matched Loads. Waveguide Attenuators – Different Types, Resistive Card and Rotary Vane Attenuators; Waveguide Phase Shifters – Types, Dielectric and Rotary Vane Phase Shifters, Waveguide Multiport Junctions – E plane and H plane Tees, Magic Tee. Directional Couplers – 2 Hole, Bethe Hole types, Illustrative Problems

Ferrites– Composition and Characteristics, Faraday Rotation, Ferrite Components – Gyrator, Isolator, Circulator.

UNIT-III:

Microwave Tubes: Limitations and Losses of conventional Tubes at Microwave Frequencies, Microwave Tubes – O Type and M Type Classifications, O-type Tubes : 2 Cavity Klystrons – Structure, Reentrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process and Small Signal Theory – Expressions for O/P Power and Efficiency. Reflex Klystrons

– Structure, Velocity Modulation and Applegate Diagram, Mathematical Theory of Bunching, Power Output, Efficiency, Oscillating Modes and O/P Characteristics, Effect of Repeller Voltage on Power O/P, Illustrative Problems.

Helix TTS: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process (qualitative treatment), Suppression of Oscillations, Gain Considerations.

UNIT-IV:

M-Type Tubes:

Introduction, Cross-field Effects, Magnetrons – Different Types, Cylindrical Traveling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode Operation, Separation of PI-Mode, o/p characteristics, Illustrative Problems

Microwave Solid State Devices: Introduction, Classification, Applications. TEDs – Introduction, Gunn Diodes – Principle, RWH Theory, Characteristics, Basic Modes of Operation - Gunn Oscillation Modes, LSA Mode, Introduction to Avalanche Transit Time Devices.

UNIT-V:

Microwave Measurements: Scattering Matrix– Significance, Formulation and Properties, S Matrix Calculations for – 2 port Junctions, E plane and H plane Tees, Magic Tee, Circulator and Isolator, Illustrative Problems.

Description of Microwave Bench – Different Blocks and their Features, Errors and Precautions, Microwave Power Measurement, Bolometers Measurement of Attenuation, Frequency Standing Wave Measurements – Measurement of Low and High VSWR, Cavity Q, Impedance Measurements.

TEXT BOOKS:

1. Microwave Devices and Circuits – Samuel Y. Liao, Pearson, 3rd Edition, 2003.
2. Microwave Principles – Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, CBS Publishers and Distributors, New Delhi, 2004.

REFERENCE BOOKS:

1. Foundations for Microwave Engineering – R.E. Collin, IEEE Press, John Wiley, 2nd Edition, 2002.
2. Microwave Circuits and Passive Devices – M.L. Sisodia and G.S.Raghuvanshi, Wiley Eastern Ltd.,New Age International Publishers Ltd., 1995.
3. Microwave Engineering Passive Circuits – Peter A. Rizzi, PHI, 1999.
4. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th Ed., 1955.
5. Microwave Engineering – A. Das and S.K. Das, TMH, 2nd Ed., 2009.
6. Microwave Engineering - G. S. Raghuvanshi and K. Satya Prasad, Cengage Learning, 2012.

Course Outcomes:

- Understand the significance of microwaves and microwave transmission lines.
- Analyze the characteristics of microwave tubes and compare them.
- Be able to list and explain the various microwave solid state devices.
- Can set up a microwave bench for measuring microwave parameters.

2014-2015 **Code: 40424**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

IV Year B.Tech. ECE-I Sem

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VLSI DESIGN

Course Objectives:

- Give exposure to different steps involved in the fabrication of ICs using MOS transistor, CMOS/BICMOS transistors and passive components.
- Explain electrical properties of MOS and BiCMOS devices to analyze the behavior of inverters designed with various loads.
- Give exposure to the design rules to be followed to draw the layout of any logic circuit.
- Provide concept to design different types of logic gates using CMOS inverter and analyze their transfer characteristics.
- Provide design concepts to design building blocks of data path of any system using gates.
- Understand basic programmable logic devices and testing of CMOS circuits.

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.

Course Outcomes:

- Acquire qualitative knowledge about the fabrication process of integrated circuit using MOS transistors.
- Choose an appropriate inverter depending on specifications required for a circuit
- Draw the layout of any logic circuit which helps to understand and estimate parasitics of any logic circuit
- Design different types of logic gates using CMOS inverter and analyze their transfer characteristics
- Provide design concepts required to design building blocks of data path using gates.
- Design simple memories using MOS transistors and can understand Design of large memories.
- design simple logic circuit using PLA, PAL, FPGA and CPLD.
- Understand different types of faults that can occur in a system and learn the concept of testing and adding extra hardware to improve testability of system

2014-2015 **Code: 40425**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

IV Year B.Tech. ECE-I Sem

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CELLULAR AND MOBILE COMMUNICATIONS

Course Objectives:

- To provide the student with an understanding of the Cellular concept, Frequency reuse, Hand-off strategies.
- To enable the student to analyze and understand wireless and mobile cellular communication systems over a stochastic fading channel
- To provide the student with an understanding of Co-channel and Non-Co-channel interferences
- To give the student an understanding of cell coverage for signal and traffic, diversity techniques and mobile antennas.
- To give the student an understanding of frequency management, Channel assignment and types of handoff.

UNIT -I:

Introduction to Cellular Mobile Radio Systems:

Limitations of Conventional Mobile Telephone Systems, Basic Cellular Mobile System, First, Second, Third and Fourth Generation Cellular Wireless Systems, Uniqueness of Mobile Radio Environment- Fading -Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time.

Fundamentals of Cellular Radio System Design:

Concept of Frequency Reuse, Co-Channel Interference, Co-Channel Interference Reduction Factor, Desired C/I From a Normal Case in a Omni Directional Antenna System, System Capacity, Trunking and Grade of Service, Improving Coverage and Capacity in Cellular Systems- Cell Splitting, Sectoring, Microcell Zone Concept.

UNIT -II:

Co-Channel Interference:

Measurement Of Real Time Co-Channel Interference, Design of Antenna System, Antenna Parameters and Their Effects, Diversity Techniques-Space Diversity, Polarization Diversity, Frequency Diversity, Time Diversity.

Non-Co-Channel Interference:

Adjacent Channel Interference, Near End Far End Interference, Cross Talk, Effects on Coverage and Interference by Power Decrease, Antenna Height Decrease, Effects of Cell Site Components.

UNIT -III:

Cell Coverage for Signal and Traffic:

Signal Reflections in Flat And Hilly Terrain, Effect of Human Made Structures, Phase Difference Between Direct and Reflected Paths, Constant Standard Deviation, Straight Line Path

Loss Slope, General Formula for Mobile Propagation Over Water and Flat Open Area, Near and Long Distance Propagation, Path Loss From a Point to Point Prediction Model in Different Conditions, Merits of Lee Model.

Cell Site and Mobile Antennas:

Space Diversity Antennas, Umbrella Pattern Antennas, Minimum Separation of Cell Site Antennas, Mobile Antennas.

UNIT -IV:

Frequency Management and Channel Assignment:

Numbering And Grouping, Setup Access And Paging Channels, Channel Assignments to Cell Sites and Mobile Units, Channel Sharing and Borrowing, Sectorization, Overlaid Cells, Non Fixed Channel Assignment.

UNIT -V:

Handoffs and Dropped Calls:

Handoff Initiation, Types of Handoff, Delaying Handoff, Advantages of Handoff, Power Difference Handoff, Forced Handoff, Mobile Assisted and Soft Handoff, Intersystem Handoff, Introduction to Dropped Call Rates and their Evaluation.

TEXT BOOKS:

1. Mobile Cellular Telecommunications – W.C.Y. Lee, Mc Graw Hill, 2nd Edn., 1989.
2. Wireless Communications - Theodore. S. Rapport, Pearson Education, 2nd Edn., 2002.
3. Mobile Cellular Communication - Gottapu sashibhushana Rao, Pearson, 2012.

REFERENCE BOOKS:

1. Principles of Mobile Communications – Gordon L. Stuber, Springer International, 2nd Edn., 2001.
2. Modern Wireless Communications-Simon Haykin, Michael Moher,Pearson Eduction, 2005.
3. Wireless Communications Theory and Techniques, Asrar U. H .Sheikh, Springer, 2004.
4. Wireless Communications and Networking, Vijay Garg, Elsevier Publications, 2007.
5. Wireless Communications – Andrea Goldsmith, Cambridge University Press, 2005.

Course Outcomes:

- By the end of the course, the student will be able to analyze and design wireless and mobile cellular systems.
- The student will be able to understand impairments due to multipath fading channel.
- The student will be able understand the fundamental techniques to overcome the different fading effects.
- The student will be able to understand Co-channel and Non-Co-channel interferences
- The student will be able to familiar with cell coverage for signal and traffic, diversity techniques and mobile antennas.
- The student will have an understanding of frequency management, Channel assignment and types of handoff.

2014-2015 **Code: 404A1**

MALLA REDDY ENGINEERING COLLEGE
(AUTONOMOUS)

IV Year B.Tech. ECE-I Sem

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DIGITAL IMAGE PROCESSING
(ELECTIVE-I)

Course Objectives:

- Provide the student with the fundamentals of digital image processing.
- Give the students a taste of the applications of the theories taught in the subject. This will be achieved through the project and some selected lab sessions.
- Introduce the students to some advanced topics in digital image processing.
- Give the students a useful skill base that would allow them to carry out further study should they be interested and to work in the field.

UNIT - I

DIGITAL IMAGE FUNDAMENTALS: Fundamental Steps in Digital Image Processing, Components of an Image Processing System, A Simple Image Formation Model, Image Sampling and Quantization, Relationships Between Pixels, Imaging Geometry.

UNIT - II

IMAGE TRANSFORMS: 2-D Fourier Transform, Properties, FFT, Walsh Transform, Hadamard Transform, Discrete Cosine Transform, Haar transform, Slant transform, Hotelling transform.

UNIT - III

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Introduction, Gray Level Transformations, Histogram Processing, Arithmetic and Logic Operations, Basics of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters.

IMAGE ENHANCEMENT IN FREQUENCY DOMAIN: Smoothing Frequency-Domain Filters, Sharpening Frequency-Domain Filters, Homomorphic Filtering.

UNIT - IV

IMAGE RESTORATION: Image Degradation/Restoration Process, Noise Models, Restoration in the Presence of Noise Only-Spatial Filtering, Periodic Noise Reduction by Frequency Domain Filtering, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filters.

COLOR IMAGE PROCESSING: Pseudo-color Image Processing, Full-color Image Processing.

UNIT - V

IMAGE COMPRESSION: Fundamentals, Image Compression Models, Elements of information Theory, Error Free Compression, Lossy Compression.

IMAGE SEGMENTATION: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation, Segmentation by Morphological Watersheds

TEXT BOOKS:

1. R. C. Gonzalez, R. E. Woods (2002), *Digital Image processing*, 3rd edition, Addison Wesley/ Pearson education, New Delhi, India.

REFERENCE BOOKS:

1. A. K. Jain (1997), *Fundamentals of Digital Image processing*, Prentice Hall of India, New Delhi.
2. Rafael C. Gonzalez (2004), *Digital Image processing using MATLAB*, Richard E. Woods and Steven Low price Edition, Pearson Education Asia, India.
3. William K. Pratt, (2004), *Digital Image Processing*, 3rd edition, John Wiley & Sons, New Delhi, India.
4. Arthur R. Weeks, Jr. (1996), *Fundamentals of Electronic Image Processing*, SPIE Optical Engineering Press, New Delhi, India.

Course Outcomes:

- Have an appreciation of the fundamentals of Digital image processing including the topics of filtering, transforms and morphology, and image analysis and compression.
- Be able to implement basic image processing algorithms in MATLAB.
- Have the skill base necessary to further explore advance d topics of Digital Image Processing.
- Be in a position to make a positive professional contribution in the field of Digital Image Processing.
- At the end of the course the student should have a clear impression of the breadth and practical scope of digital image processing and have arrived at a level of understanding that is the foundation for most of the work currently underway in this field.

2014-2015 **Code: 404A2**

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MULTIMEDIA AND SIGNAL CODING
(ELECTIVE-I)

Course Objectives:

- To provide an introduction to the fundamental principles and techniques in Multimedia Signal coding and compression.
- To give an overview of current multimedia standards and technologies.
- To provide techniques related to computer and multimedia networks.
- To provide knowledge related to Multimedia Network Communications and Applications.

UNIT-I:

Introduction to Multimedia: Multimedia, World Wide Web, Overview of Multimedia Tools, Multimedia Authoring, Graphics/ Image Data Types, and File Formats.

Color in Image and Video: Color Science – Image Formation, Camera Systems, Gamma Correction, Color Matching Functions, CIE Chromaticity Diagram, Color Monitor Specifications, Out-of-Gamut Colors, White Point Correction, XYZ to RGB Transform, Transform with Gamma Correction, L*A*B* Color Model. Color Models in Images – RGB Color Model for CRT Displays, Subtractive Color: CMY Color Model, Transformation from RGB to CMY, Under Color Removal: CMYK System, Printer Gamuts, Color Models in Video – Video Color Transforms, YUV Color Model, YIQ Color Model, Ycbcr Color Model.

UNIT-II:

Video Concepts: Types of Video Signals, Analog Video, Digital Video.

Audio Concepts: Digitization of Sound, Quantization and Transmission of Audio.

UNIT-III:

Compression Algorithms:

Lossless Compression Algorithms: Run Length Coding, Variable Length Coding, Arithmetic Coding, Lossless JPEG, Image Compression.

Lossy Image Compression Algorithms: Transform Coding: KLT And DCT Coding, Wavelet Based Coding.

Image Compression Standards: JPEG and JPEG2000.

UNIT-IV:

Video Compression Techniques: Introduction to Video Compression, Video Compression Based on Motion Compensation, Search for Motion Vectors, H.261- Intra-Frame and Inter-Frame Coding, Quantization, Encoder and Decoder, Overview of MPEG1 and MPEG2.

UNIT-V:

Audio Compression Techniques: ADPCM in Speech Coding, G.726 ADPCM, Vocoders – Phase Insensitivity, Channel Vocoder, Formant Vocoder, Linear Predictive Coding, CELP, Hybrid Excitation Vocoders, MPEG Audio – MPEG Layers, MPEG Audio Strategy, MPEG Audio Compression Algorithms, MPEG-2 AAC, MPEG-4 Audio.

TEXT BOOKS:

1. Fundamentals of Multimedia – Ze- Nian Li, Mark S. Drew, PHI, 2010.
2. Multimedia Signals & Systems – Mrinal Kr. Mandal Springer International Edition 1st Edition, 2009

REFERENCE BOOKS:

1. Multimedia Communication Systems – Techniques, Stds & Netwroks K.R. Rao, Zorans. Bojkoric, Dragorad A.Milovanovic, 1st Edition, 2002.
2. Fundamentals of Multimedia Ze- Nian Li, Mark S.Drew, Pearson Education (LPE), 1st Edition, 2009.
3. Multimedia Systems John F. Koegel Bufond Pearson Education (LPE), 1st Edition, 2003.
4. Digital Video Processing – A. Murat Tekalp, PHI, 1996.
5. Video Processing and Communications – Yaowang, Jorn Ostermann, Ya-QinZhang, Pearson,2002

Course Outcomes:

- Understand the fundamentals behind multimedia signal processing.
- Understand the fundamentals behind multimedia compression.
- Understand the basic principles behind existing multimedia compression and communication standards.
- Understand future multimedia technologies.
- Apply the acquired knowledge to specific multimedia related problems and projects at work.
- Take advanced courses in this area.

2014-2015 **Code: 40535**

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OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(ELECTIVE-I)

Course Objectives:

- To know the basic knowledge about the OOPs technology
- To know about Inheritance, packages and interfaces.
- To know about Exception handling, multithreading and Event handling

UNIT-I:

Object Oriented Thinking and Java Basics:

Need for OOP Paradigm, Summary of OOP Concepts, Coping with Complexity, Abstraction Mechanisms, A Way of Viewing World – Agents, Responsibility, Messages, Methods, History of Java, Java Buzzwords, Data Types, Variables, Scope and Life Time of Variables, Arrays, Operators, Expressions, Control Statements, Type Conversion and Casting, Simple Java Program, Concepts of Classes, Objects, Constructors, Methods, Access Control, This Keyword, Garbage Collection, Overloading Methods and Constructors, Method Binding, Inheritance, Overriding and Exceptions, Parameter Passing, Recursion, Nested and Inner Classes, Exploring String Class.

UNIT-II:

Inheritance, Packages and Interfaces:

Hierarchical Abstractions, Base Class Object, Subclass, Subtype, Substitutability, Forms of Inheritance- Specialization, Specification, Construction, Extension, Limitation, Combination, Benefits of Inheritance, Costs of Inheritance. Member Access Rules, Super Uses, Using Final with Inheritance, Polymorphism- Method Overriding, Abstract Classes, The Object Class.

Defining, Creating and Accessing a Package, Understanding Classpath, Importing Packages, Differences between Classes and Interfaces, Defining an Interface, Implementing Interface, Applying Interfaces, Variables in Interface and Extending Interfaces, Exploring Java.IO.

UNIT-III:

Exception Handling and Multithreading:

Concepts of Exception Handling, Benefits of Exception Handling, Termination or Resumptive Models, Exception Hierarchy, Usage of Try, Catch, Throw, Throws and Finally, Built in Exceptions, Creating Own Exception Sub Classes.

String Handling, Exploring Java.Util, Differences between Multi-Threading and Multitasking, Thread Life Cycle, Creating Threads, Thread Priorities, Synchronizing Threads, Interthread Communication, Thread Groups, Daemon Threads.

Enumerations, Autoboxing, Annotations, Generics.

UNIT-IV:

Event Handling:

Events, Event Sources, Event Classes, Event Listeners, Delegation Event Model, Handling Mouse and Keyboard Events, Adapter Classes.

The AWT Class Hierarchy, User Interface Components- Labels, Button, Canvas, Scrollbars, Text Components, Check Box, Check Box Groups, Choices, Lists Panels – Scrollpane, Dialogs, Menubar, Graphics, Layout Manager – Layout Manager Types – Border, Grid, Flow, Card and Grid Bag.

UNIT-V:

Applets:

Concepts f Applets, Differences between Applets and Applications, Life Cycle of an Applet, Types of Applets, Creating Applets, Passing Parameters to Applets.

Swing:

Introduction, Limitations of AWT, MVC Architecture, Components, Containers, Exploring Swing- Japplet, Jframe and Jcomponent, Icons and Labels, Text Fields, Buttons – The Jbutton Class, Check Boxes, Radio Buttons, Combo Boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

TEXT BOOKS:

1. Java the Complete Reference, 7th Editon, Herbert Schildt, TMH.
2. Understanding OOP with Java Updated Edition, T. Budd, Pearson Eduction.

REFERENCE BOOKS:

1. An Introduction to Programming and OO Design using Java, J.Nino and F.A. Hosch, John wiley & Sons.
2. An Introduction to OOP, Third Edition, T. Budd, Pearson Education.
3. Introduction to Java Programming, Y. Daniel Liang, Pearson Education.
4. An Introduction to Java Programming and Object Oriented Application Development, R.A. Johnson- Thomson.
5. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Eighth Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, eighth Edition, Pearson Education

Course Outcomes:

- Able to know the basic knowledge about the OOPs technology
- Able to know about Inheritance, packages and interfaces.
- Able to know about Exception handling, multithreading and Event handling

2014-2015 **Code: 404B1**

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TELEVISION ENGINEERING
(ELECTIVE-II)

Course Objectives:

The objectives of the course are:

- To familiarize the students with Television transmitters and receivers and TV signal transmission.
- To make them understand different signal processing steps monochrome television.
- To introduce colour television transmitters and receivers.

UNIT–I:

Introduction:

TV transmitter and receivers, synchronization. Geometric form and aspect ratio, image continuity, interlaced scanning, picture resolution, Composite video signal, TV standards.Camera tubes:image Orthicon, Plumbicon, vidicon, silicon Diode Array vidicon, Comparison of camera tubes, Monochrome TV camera,

TV Signal Transmission a**nd Propagation**:

Picture Signal transmission, positive and negative modulation, VSB transmission, sound signal transmission, standard channel BW,TV transmitter, TV signal propagation, interference, TV broadcast channels, TV transmission Antennas.

UNIT –II:

Monochrome TV Receiver:

RF tuner, IF subsystem, video amplifier, sound section, sync separation and processing, deflection circuits, scanning circuits, AGC, noise cancellation, video and inter carrier sound signal detection, vision IF subsystem of Black and White receivers, Receiver sound system: FM detection, FM Sound detectors, and typical applications.

UNIT -III:

Sync Separation and Detection:

TV Receiver Tuners, Tuner operation, VHF and UHF tuners, digital tuning techniques, remote control of receiver functions.Sync Separation, AFC and Deflection Oscillators: Synchronous separation, k noise in sync pulses, separation of frame and line sync pulses. AFC, single ended AFC circuit, Deflection Oscillators, deflection drive ICs, Receiver Antennas, Picture Tubes,

UNIT–IV:

Color Television:

Colour signal generation, additive colour mixing, video signals for colours, colour difference signals, encoding, Perception of brightness and colours luminance signal, Encoding of colour difference signals, formation of chrominance signals, color cameras, Colour picture tubes.

Color Signal Encoding and Decoding:

NTSC colour system PAL colour system, PAL encoder, PAL-D Decoder, chrome signal amplifiers, separation of U and V signals, colour burst separation, Burst phase discriminator, ACC amplifier, Reference oscillator, Indent and colour killer circuits, U& V demodulators.

UNIT –V:

Color Receiver:

Introduction to colour receiver, Electron tuners, IF subsystem, Y-signal channel, Chroma decoder, Separation of U & V Color, Phasors, synchronous demodulators, Sub carrier generation, raster circuits.

Digital TV:

Introduction to Digital TV, Digital Satellite TV, Direct to Home Satellite TV, Digital TV Transmitter, Digital TV Receiver, Digital Terrestrial TV, LCD TV, LED TV, CCD Image Sensors, HDTV.

TEXT BOOKS:

1. Television and Video Engineering- A.M.Dhake, 2nd Edition.
2. Modern Television Practice – Principles, Technology and Service- R.R.Gallatin, New Age International Publication, 2002.
3. Monochrome and Colour TV- R.R. Gulati, New Age International Publication, 2002.

REFERENCE BOOKS:

1. Colour Television Theory and Practice-S.P.Bali, TMH, 1994.
2. Basic Television and Video Systems-B.Grob and C.E.Herndon, McGraw Hill, 1999.

Course Outcomes:

- Understand TV standards and picture tubes for monochrome TV.
- Distinguish between monochrome and colour Television transmitters and receivers.
- Analyze and Evaluate the NTSC and PAL colour systems.

2014-2015 **Code: 404B2**

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OPTICAL COMMUNICATIONS
(ELECTIVE-II)

Course Objectives:

- To realize the significance of optical fibre communications.
- To understand the construction and characteristics of optical fibre cable.
- To develop the knowledge of optical signal sources and power launching.
- To identify and understand the operation of various optical detectors.
- To understand the design of optical systems and WDM.

UNIT -I:

Overview of Optical Fiber Communication: - Historical development, The general system, Advantages of Optical Fiber Communications, Optical Fiber Wave Guides- Introduction, Ray Theory Transmission, Total Internal Reflection, Acceptance Angle, Numerical Aperture, Skew Rays, Cylindrical Fibers- Modes, Vnumber, Mode Coupling, Step Index Fibers, Graded Index Fibers.

Single Mode Fibers- Cut Off Wavelength, Mode Field Diameter, Effective Refractive Index, Fiber Materials Glass, Halide, Active Glass, Chalgenide Glass, Plastic Optical Fibers.

UNIT -II:

Signal Distortion in Optical Fibers: Attenuation, Absorption, Scattering and Bending Losses, Core and Cladding Losses, Information Capacity Determination, Group Delay, Types of Dispersion - Material Dispersion, Wave-Guide Dispersion, Polarization Mode Dispersion, Intermodal Dispersion, Pulse Broadening, Optical Fiber Connectors- Connector Types, Single Mode Fiber Connectors, Connector Return Loss.

UNIT -III:

Fiber Splicing: Splicing Techniques, Splicing Single Mode Fibers, Fiber Alignment and Joint Loss- Multimode Fiber Joints, Single Mode Fiber Joints, Optical Sources- LEDs, Structures, Materials, Quantum Efficiency, Power, Modulation, Power Bandwidth Product, Injection Laser Diodes- Modes, Threshold Conditions, External Quantum Efficiency, Laser Diode Rate Equations, Resonant Frequencies, Reliability of LED & ILD.

Source to Fiber Power Launching: - Output Patterns, Power Coupling, Power Launching, Equilibrium Numerical Aperture, Laser Diode to Fiber Coupling.

UNIT -IV:

Optical Detectors: Physical Principles of PIN and APD, Detector Response Time, Temperature Effect on Avalanche Gain, Comparison of Photo Detectors, Optical Receiver Operation- Fundamental Receiver Operation, Digital Signal Transmission, Error Sources, Receiver Configuration, Digital Receiver Performance, Probability of Error, Quantum Limit, Analog Receivers.

UNIT -V:

Optical System Design: Considerations, Component Choice, Multiplexing, Point-to- Point Links, System Considerations, Link Power Budget with Examples, Overall Fiber Dispersion in Multi-Mode and Single Mode Fibers, Rise Time Budget with Examples.

Transmission Distance, Line Coding in Optical Links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye Pattern.

TEXT BOOKS:

1. Optical Fiber Communications – Gerd Keiser, TMH, 4th Edition, 2008.
2. Optical Fiber Communications – John M. Senior, Pearson Education, 3rd Edition, 2009.

REFERENCE BOOKS:

1. Fiber Optic Communications – D.K. Mynbaev , S.C. Gupta and Lowell L. Scheiner, Pearson Education, 2005.
2. Text Book on Optical Fibre Communication and its Applications – S.C.Gupta, PHI, 2005.
3. Fiber Optic Communication Systems – Govind P. Agarwal , John Wiley, 3rd Ediition, 2004.
4. Introduction to Fiber Optics by Donald J.Sterling Jr. – Cengage learning, 2004.
5. Optical Communication Systems – John Gowar, 2nd Edition, PHI, 2001.

Course Outcomes:

- Understand and analyze the constructional parameters of optical fibres.
- Be able to design an optical system.
- Estimate the losses due to attenuation, absorption, scattering and bending.
- Compare various optical detectors and choose suitable one for different applications.

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EMBEDDED SYSTEMS DESIGN
(ELECTIVE – II)

Course Objectives:

- 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.

Course Outcomes:

- Understand and design embedded systems.
- Learn basic of OS and RTOS
- Understand types of memory and interfacing to external world.
- Understand embedded firmware design approaches

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E-CAD AND VLSI DESIGN LAB

List of Experiments:

Design and implementation of the following CMOS digital/analog circuits using Cadence / Mentor Graphics / Synopsys / GEDS / Equivalent CAD tools. The design shall include Gate-level design, Transistor-level design, Hierarchical design, Verilog HDL/VHDL design, Logic systhesis, Simulation and verification, Scaling of CMOS Inverter for different technologies, study of secondary effects (temperature, power supply and process corners), Circuit optimization with respect to area, performance and/or power, Layout, Extraction of parasitic and back annotation, modifications in circuit parameters and layout consumption, DC/transient analysis, Verification of layouts (DRC, LVS).

E-CAD Programs:

Programming can be done using any complier. Down load the programs on FPGA/COLD boards and performance testing may be done using pattern generator (32 channels) and logic analyzer apart from verification by simulation with any of the front end tools.

1. HDL code to realize all the logic gates.
2. Design of 8-to-3 encoder (without and with parity)
3. Design of 4 bit binary to gray converter
4. Design of Multiplexer/Demultiplexer, comparator
5. Design of Full adder using 3 modeling styles
6. Design of flip flops: SR, D, JK, T
7. Design of 4-bit binary, BCD counters (synchronous/asynchronous reset) or any sequence counter

VLSI Programs:

1. Introduction to layout design rules
2. Layout, Physical verification, placement & route for complex design, static timing analysis, IR drop analysis and crosstalk analysis of the following:
   - Basic logic gates
   - CMOS inverter
   - CMOS NOR/NAND gates
   - CMOS XOR and MUX gates
   - CMOS 1-bit full adder
   - Static/Dynamic logic circuit (register cell)
   - Latch
   - Pass transistor

3. Layout of any combinational circuit (complex CMOS logic gate) – Learning about data paths.

4. Introduction to SPICE simulation and coding of NMOS/CMOS circuit.
5. SPICE simulation of basic analog circuits: Inverter / Differential amplifier.
6. Analog Circuit simulation (AC analysis) – CS & CD amplifier.
7. System level design using PLL.

Note: Any SIX of the above experiments from each part are to be conducted (Total 12)

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MICROWAVE ENGINEERING AND DIGITAL COMMUNICATIONS LAB

Note: Minimum 12 Experiments to be conducted

Part – A: Microwave Engineering Lab (Any 6 Experiments):

1. Reflex Klystron Characteristics
2. Gunn Diode Characteristics
3. Directional Coupler Characteristics
4. VSWR Measurement
5. Measurement of Waveguide Parameters
6. Measurement of Impedance of a given Load
7. Measurement of Scattering parameters of a Magic Tee
8. Measurement of Scattering parameters of a Circulator
9. Attenuation Measurement
10. Microwave Frequency Measurement

Part – B: Digital Communication Lab (Any 6 Experiments):

1. PCM Generation and Detection
2. Differential Pulse Code Modulation
3. Delta Modulation
4. Time Division Multiplexing of 2 Band Limited Signals
5. Frequency shift keying: Generation and Detection
6. Phase Shift Keying: Generation and Detection
7. Amplitude Shift Keying: Generation and Detection
8. Study of the spectral characteristics of PAM, QAM
9. DPSK :Generation and Detection
10. QPSK : Generation and Detection

Equipment required for the Laboratory:

Microwave Engineering Lab:

Microwave Bench set up with Klystron Power Supply
Microwave Bench set up with Gunn Power Supply
Micro Ammeter
VSWR meter
Microwave Components

Digital Communication Lab:

RPS: 0-30V
CRO: 0-20MHz
Function Generators: 0-1MHz
RF Generators: 0-100MHz
Experimental Kits /Modules

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SATELLITE COMMUNICATIONS
(ELECTIVE –III)

Course Objectives:

- To prepare students to excel in basic knowledge of satellite communication principles
- To provide students with solid foundation in orbital mechanics and launches for the satellite communication
- To train the students with a basic knowledge of link design of satellite with a design examples.
- To provide better understanding of multiple access systems and earth station technology
- To prepare students with knowledge in satellite navigation and GPS& and satellite packet communications

UNIT -I:

Communication Satellite: Orbit and Description:

A Brief history of satellite Communication, Satellite Frequency Bands, Satellite Systems, Applications, Orbital Period and Velocity, effects of Orbital Inclination, Azimuth and Elevation, Coverage angle and slant Range, Eclipse, Orbital Perturbations, Placement of a Satellite in a Geo-Stationary orbit.

UNIT -II:

Satellite Sub-Systems:

Attitude and Orbit Control system, TT&C subsystem, Attitude Control subsystem, Power systems, Communication subsystems, Satellite Antenna Equipment.

Satellite Link:

Basic Transmission Theory, System Noise Temperature and G/T ratio, Basic Link Analysis, Interference Analysis, Design of satellite Links for a specified C/N, (With and without frequency Re-use), Link Budget.

UNIT -III:

Propagation effects:

Introduction, Atmospheric Absorption, Cloud Attenuation, Tropospheric and Ionospeheric Scintillation and Low angle fading, Rain induced attenuation, rain induced cross polarization interference.

Multiple Access:

Frequency Division Multiple Access (FDMA) – Inter modulation, Calculation of C/N, Time Division Multiple Access (TDMA) - Frame Structure, Burst Structure, Satellite Switched TDMA, On-board Processing, Demand Assignment Multiple Access (DAMA) – Types of Demand Assignment, Characteristics, CDMA Spread Spectrum Transmission and Reception.

UNIT -IV:

Earth Station Technology:

Transmitters, Receivers, Antennas, Tracking Systems, Terrestrial Interface, Power Test Methods, Lower Orbit Considerations.

Satellite Navigation and Global Positioning Systems:

Radio and Satellite Navigation, GPS Position Location Principles, GPS Receivers, GPS C/A Code Accuracy, Differential GPS.

UNIT -V:

Satellite Packet Communications:

Message Transmission by FDMA: M/G/1 Queue, Message Transmission by TDMA, PURE ALOHA-Satellite Packet Switching, Slotted Aloha, Packet Reservation, Tree Algorithm.

TEXT BOOKS:

1. Satellite Communications –Timothy Pratt, Charles Bostian, Jeremy Allnutt, 2nd Edition, 2003, John Wiley & Sons.
2. Satellite Communications Engineering – Wilbur, L. Pritchand, Robert A. Nelson and Heuri G. Suyderhoud, 2nd Ed., Pearson Publications.
3. Digital Satellite Communications-Tri.T.Ha, 2nd Edition, 1990, Mc.Graw Hill.

REFERENCE BOOKS:

1. Satellite Communications-Dennis Roddy, 2nd Edition, 1996, McGraw Hill.
2. Satellite Communications: Design Principles – M. Richcharia, 2nd Ed., BSP, 2003.
3. Digital Satellite Communications – Tri. T. Ha, 2nd Ed., MGH, 1990.
4. Fundamentals of Satellite Communications – K. N. Raja Rao, PHI, 2004.

Course Outcomes:

- Students will understand the historical background, basic concepts and frequency allocations for satellite communication
- Students will demonstrate orbital mechanics, launch vehicles and launchers
- Students will demonstrate the design of satellite links for specified C/N with system design examples.
- Students will be able to visualize satellite sub systems like Telemetry, tracking, command and monitoring power systems etc.
- Students will understand the various multiple access systems for satellite communication systems and satellite packet communications.

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BIOMEDICAL INSTRUMENTATION
(ELECTIVE–III)

Course Objectives:

- To study bio amplifier, bio signals and measurement of physiological parameters.
- To know about different bio electrodes and activities of heart.
- To understand therapeutic and cardic instrumentation.
- To study EEG and EMG machines, recordings and interpretations.

UNIT-I:

Components of Medical Instrumentation System:

Bioamplifier, Static and Dynamic Characteristics of Medical Instruments, Biosignals and Characteristics, Problems encountered with Measurements from Human beings. Organization of Cell, Derivation of Nernst equation for Membrane Resting Potential Generation and Propagation of Action Potential, Conduction through Nerve to Neuromuscular Junction.

UNIT-II:

Bio Electrodes:

Biopotential Electrodes-External Electrodes, Internal Electrodes, Biochemical Electrodes. Mechanical Function, Electrical Conduction System of the Heart, Cardiac Cycle, Relation between Electrical and Mechanical Activities of the Heart.

UNIT-III:

Cardiac Instrumentation:

Blood Pressure and Blood Flow Measurement, Specification of ECG Machine, Einthoven Triangle, Standard 12-Lead Configurations, Interpretation of ECG waveform with respect to Electro Mechanical Activity of the Heart.

UNIT-IV:

Therapeutic Equipment:

Pacemaker, Defibrillator, Shortwave Diathermy, Hemodialysis Machine.

Respiratory Instrumentation:

Mechanism of Respiration, Spirometry, Pnemuotachograph Ventilators.

UNIT-V:

Neuro-Muscular Instrumentation:

Specification of EEG and EMG Machines, Electrode Placement for EEG and EMG Recording, Interpretation of EEG and EMG.

TEXT BOOKS:

1. Biomedical Instrumentation and Measurements – by Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, PHI.
2. Medical Instrumentation, Application and Design – by John G. Webster, John Wiley.

REFERENCE BOOKS:

1. Principles of Applied Biomedical Instrumentation – by L.A. Geoddes and L.E. Baker, John Wiley and Sons.
2. Hand-book of Biomedical Instrumentation – by R.S. Khandpur, McGraw-Hill, 2003.
3. Biomedical Telemetry – by Mackay, Stuart R., John Wiley.

Course Outcomes:

- The concept of biomedical instrumentation.
- Understand bio electrodes and activities of heart.
- Analyze ECG, EEG and EMG recordings for disorder identification.

2014-2015 **Code: 404C3**

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ARTIFICIAL NEURAL NETWORKS
(ELECTIVE-III)

Course Objectives:

- Understand the basic building blocks of artificial neural networks (ANNs)
- Understand the role of neural networks in engineering and artificial intelligence modeling
- Provide knowledge of supervised/unsupervised learning in neural networks
- Provide knowledge of single layer and multilayer perceptions.
- To know about self-organizational maps and Hopfield models.

UNIT-I:

Introduction: A Neural Network, Human Brain, Models of a Neuron, Neural Networks viewed as Directed Graphs, Network Architectures, Knowledge Representation, Artificial Intelligence and Neural Networks

Learning Process: Error Correction Learning, Memory Based Learning, Hebbian Learning, Competitive, Boltzmann Learning, Credit Assignment Problem, Memory, Adaption, Statistical Nature of the Learning Process

UNIT-II:

Single Layer Perceptrons: Adaptive Filtering Problem, Unconstrained Organization Techniques, Linear Least Square Filters, Least Mean Square Algorithm, Learning Curves, Learning Rate Annealing Techniques, Perceptron –Convergence Theorem, Relation Between Perceptron and Bayes Classifier for a Gaussian Environment

Multilayer Perceptron: Back Propagation Algorithm XOR Problem, Heuristics, Output Representation and Decision Rule, Computer Experiment, Feature Detection

UNIT-III:

Back Propagation: Back Propagation and Differentiation, Hessian Matrix, Generalization, Cross Validation, Network Pruning Techniques, Virtues and Limitations of Back Propagation Learning, Accelerated Convergence, Supervised Learning

UNIT-IV:

Self-Organization Maps (SOM): Two Basic Feature Mapping Models, Self-Organization Map, SOM Algorithm, Properties of Feature Map, Computer Simulations, Learning Vector Quantization, Adaptive Patter Classification

UNIT-V:

Neuro Dynamics: Dynamical Systems, Stability of Equilibrium States, Attractors, Neuro Dynamical Models, Manipulation of Attractors as a Recurrent Network Paradigm

Hopfield Models – Hopfield Models, Computer Experiment

TEXT BOOKS:

1. Neural Networks a Comprehensive Foundations, Simon Haykin, PHI edition.

REFERENCE BOOKS:

1. Artificial Neural Networks - B. Vegnanarayana Prentice Hall of India P Ltd 2005
2. Neural Networks in Computer Inteligance, Li Min Fu TMH 2003
3. Neural Networks -James A Freeman David M S Kapura Pearson Education 2004.
4. Introduction to Artificial Neural Systems Jacek M. Zurada, JAICO Publishing House Ed. 2006.

Course Outcomes:

- Explain the function of artificial neural networks of the Back-prop, Hopfield and SOM type
- Explain the difference between supervised and unsupervised learning
- Describe the assumptions behind, and the derivations of the ANN algorithms dealt with in the course
- Give example of design and implementation for small problems
- Implement ANN algorithms to achieve signal processing, optimization, classification and process modeling

2014-2015 **Code: 404D1**

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TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS (ELECTIVE-IV)

Course objectives:

- To learn Switching, Signaling and traffic in the context of telecommunication network.
- To expose through the evolution of switching systems from manual and electromechanical systems to stored-program-controlled digital systems.
- To study signaling, packet switching and networks.

UNIT-I:

Switching Systems: Evolution of Telecommunications; Basics of a Switching System; Functions of a Switching System; Crossbar Switching-Principle of Crossbar Switching; Crossbar Switch Configurations; Cross-Point Technology; Crossbar Exchange Organization; A General Trunking; Electronic Switching; Digital Switching Systems.

Telecommunications Traffic: Introduction; The Unit of Traffic; Congestion; Traffic Measurement; A Mathematical Model; Lost-Call Systems-Theory; Traffic Performance; Loss Systems in Tandem; Use of Traffic Tables; Queuing Systems-The Second Erlang Distribution; Probability of Delay; Finite Queue Capacity; Some Other Useful Results; Systems with a Single Server; Queues in Tandem; Delay Tables; Applications of Delay Formulae.

UNIT-II:

Switching Networks: Single Stage Networks; Gradings-Principle; Two Stage Networks; Three Stage Networks; Four Stage Networks

Time Division Switching: Basic Time Division Space Switching; Basic Time Division Time Switching; Time Multiplexed Space Switching; Time Multiplexed Time Switching; Combination Switching; Three Stage Combination Switching.

Control of Switching Systems: Call Processing Functions-Sequence of Operations; Signal Exchanges; State Transition Diagrams; Common Control; Reliability; Availability and Security; Stored Program Control.

UNIT-III:

Signaling: Introduction; Customer Line Signaling; Audio Frequency Junctions and Trunk Circuits; FDM Carrier Systems-Outband Signaling; Inband (VF) Signaling; PCM Signaling; Inter Register Signaling; Common Channel Signaling Principles-General Signaling Networks; CCITT Signaling System Number 6; CCITT Signaling System Number 7; The High Level Data Link Control Protocol; Signal Units; The Signaling Information Field.

UNIT-IV:

Packet Switching: Introduction; Statistical Multiplexing; Local Area And Wide Area Networks-Bus Networks; Ring Networks; Comparison of Bus and Ring Networks; Optical Fiber Networks; Large Scale Networks-General; Datagrams and Virtual Circuits; Routing; Flow Control;

Standards; Frame Relay; Broadband Networks-General; The Asynchronous Transfer Mode; ATM Switches.

UNIT-V:

Networks: Introduction; Analog Networks; Integrated Digital Networks; Integrated Services Digital Networks; Cellular Radio Networks; Intelligent Networks; Private Networks; Charging; Routing – General, Automatic Alternative Routing.

TEXT BOOKS:

1. J. E Flood, "Telecommunications Switching and Traffic Networks," Pearson Education, 2006.
2. Tyagarajan Viswanathan, "Telecommunications Switching Systems and Networks," Prentice Hall of India Pvt. Ltd., 2006.

REFERENCE BOOKS:

1. John C Bellamy, "Digital Telephony," John Wiley International Student Edition,3rd Edition, 2000.
2. Behrouz A. Forouzan, "Data Communications and Networking," TMH, 2nd Edition, 2002.
3. Tomasi," Introduonction to Data Communication and Networking," Pearson Education, 1st Edition, 2007.

Course outcomes:

- Understand the main concepts of telecommunication network design
- Analyze and evaluate fundamental telecommunication traffic models.
- Understand basic modern signaling system.
- Solve traditional interconnection switching system design problems.
- Understand the concept of packet switching

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RADAR SYSTEMS
(ELECTIVE-IV)

Course Objectives:

- Radar fundamentals and analysis of the radar signals.
- To understand various technologies involved in the design of radar transmitters and receivers.
- To learn various radars like MTI, Doppler and tracking radars and their comparison.

UNIT–I:

Basics of Radar : Introduction, Maximum Unambiguous Range, Simple form of Radar Equation, Radar Block Diagram and Operation, Radar Frequencies and Applications. Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, Modified Radar Range Equation, Illustrative Problems.

Radar Equation : SNR, Envelope Detector – False Alarm Time and Probability, Integration of Radar Pulses, Radar Cross Section of Targets (simple targets - sphere, cone-sphere), Transmitter Power, PRF and Range Ambiguities, System Losses (qualitative treatment), Illustrative Problems.

UNIT–II:

CW and Frequency Modulated Radar : Doppler Effect, CW Radar – Block Diagram, Isolation between Transmitter and Receiver, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar. Illustrative Problems

FM-CW Radar: Range and Doppler Measurement, Block Diagram and Characteristics, FM-CW altimeter, Multiple Frequency CW Radar.

UNIT-III:

MTI and Pulse Doppler Radar: Introduction, Principle, MTI Radar with - Power Amplifier Transmitter and Power Oscillator Transmitter, Delay Line Cancellers – Filter Characteristics, Blind Speeds, Double Cancellation, Staggered PRFs. Range Gated Doppler Filters. MTI Radar Parameters, Limitations to MTI Performance, MTI versus Pulse Doppler Radar.

UNIT –IV:

Tracking Radar: Tracking with Radar, Sequential Lobing, Conical Scan, Monopulse Tracking Radar – Amplitude Comparison Monopulse (one- and two- coordinates), Phase Comparison Monopulse, Tracking in Range, Acquisition and Scanning Patterns, Comparison of Trackers.

UNIT –V:

Detection of Radar Signals in Noise : Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Correlation Function and Cross-correlation Receiver, Efficiency of Non-matched Filters, Matched Filter with Non-white Noise.

Radar Receivers – Noise Figure and Noise Temperature, Displays – types. Duplexers – Branch type and Balanced type, Circulators as Duplexers. Introduction to Phased Array Antennas – Basic Concepts, Radiation Pattern, Beam Steering and Beam Width changes, Applications, Advantages and Limitations.

TEXT BOOKS:

1. Introduction to Radar Systems – Merrill I. Skolnik, TMH Special Indian Edition, 2nd Ed., 2007.

REFERENCE BOOKS:

1. Radar: Principles, Technology, Applications – Byron Edde, Pearson Education, 2004.
2. Radar Principles – Peebles, Jr., P.Z., Wiley, New York, 1998.
3. Principles of Modern Radar: Basic Principles – Mark A. Richards, James A. Scheer, William A. Holm, Yesdee, 2013

Course Outcomes:

- Understand radar fundamentals and analysis of the radar signals.
- Understand various radar transmitters and receivers.
- Understand various radars like MTI, Doppler and tracking radars and their comparison.

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NETWORK SECURITY & CRYPTOGRAPHY
(ELECTIVE-IV)

Course Objectives:

- To acquire an understanding of network security and its changing character.
- To understand how network security is conceptualized and carried out.
- To examine conventional encryption and cryptography techniques.
- To articulate informed opinion about issues related to network IP security.
- To identify and investigate web security requirements.
- To appreciate the concepts of SNMP and design principles of firewall.

UNIT–I:

Security Attacks: (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, A model for Internetwork security, Internet Standards and RFCs, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

UNIT–II:

Conventional Encryption: Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC.

UNIT –III:

Public Key Cryptography: principles, public key cryptography algorithms, digital signatures, digital Certificates, Certificate Authority and key management Kerberos, X.509 Directory Authentication Service.

Email Privacy: Pretty Good Privacy (PGP) and S/MIME.

UNIT –IV:

IP Security: Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Web Security Requirements: Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET).

UNIT –V:

Basic Concepts of SNMP: SNMPv1 Community facility and SNMPv3, Intruders, Viruses and related threats.

Firewall: Design principles, Trusted Systems, Intrusion Detection Systems.

TEXT BOOKS:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permeh, wiley Dreamtech

REFERENCE BOOKS:

1. Fundamentals of Network Security by Eric Maiwald (Dreamtech press)
2. Network Security - Private Communication in a Public World by Charlie Kaufman,Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third Edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Thomson.
5. Network Security: The complete reference, Robert Bragg, Mark Rhodes, TMH
6. Introduction to Cryptography, Buchmann, Springer.
7. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
8. Information Systems Security,Godbole,Wiley Student Edition.
9. Cryptography and network Security,B.A.Forouzan,D.Mukhopadhyay,2nd Edition,TMH.

Course Outcomes:

- Acquire an understanding of network security and its changing character.
- Understand conventional encryption and cryptography techniques.
- Analyze issues related to network IP security.
- Identify and investigate web security requirements.
- Know the concepts of SNMP and design principles of firewall.

2014-2015 **Code: 404E1**

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WIRELESS COMMUNICATIONS AND NETWORKS
(ELECTIVE-V)

Course objectives:

- To provide the students with the fundamental treatment about many practical and theoretical concepts that forms basic of wireless communications.
- To equip the students with various kinds of wireless networks and its operations.
- To prepare students to understand the concept of frequency reuse, and be able to apply it in the design of mobile cellular system.
- To train students to understand the architecture and operation of various wireless wide area networks such as GSM, IS-95, GPRS and SMS.
- To prepare students to understand the emerging technique OFDM and its importance in the wireless communications.

UNIT - I

INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS: Evolution of mobile radio communications, examples of wireless communication systems-paging systems, cordless telephone systems, cellular telephone systems, comparison of common wireless communication systems, trends in cellular radio and personal communications.

MODERN WIRELESS COMMUNICATION SYSTEMS: Second generation (2G) cellular networks, third generation (3G) wireless networks, wireless local loop (WLL) and LMDS, wireless local area networks (WLANs), Bluetooth and personal area networks (PANs).

UNIT –II:

Mobile Radio Propagation: Large-Scale Path Loss:

Introduction to Radio Wave Propagation, Free Space Propagation Model, Relating Power to Electric Field, The Three Basic Propagation Mechanisms, Reflection-Reflection from Dielectrics, Brewster Angle, Reflection from prefect conductors, Ground Reflection (Two-Ray) Model, Diffraction-Fresnel Zone Geometry, Knife-edge Diffraction Model, Multiple knife-edge Diffraction, Scattering, Outdoor Propagation Models- Longley-Ryce Model, Okumura Model, Hata Model, PCS Extension to Hata Model, Walfisch and Bertoni Model, Wideband PCS Microcell Model, Indoor Propagation Models-Partition losses (Same Floor), Partition losses between Floors, Log-distance path loss model, Ericsson Multiple Breakpoint Model, Attenuation Factor Model, Signal penetration into buildings, Ray Tracing and Site Specific Modeling.

UNIT –III:

Mobile Radio Propagation: Small –Scale Fading and Multipath

Small Scale Multipath propagation-Factors influencing small scale fading, Doppler shift, Impulse Response Model of a multipath channel- Relationship between Bandwidth and Received

power, Small-Scale Multipath Measurements-Direct RF Pulse System, Spread Spectrum Sliding Correlator Channel Sounding, Frequency Domain Channels Sounding, Parameters of Mobile Multipath Channels-Time Dispersion Parameters, Coherence Bandwidth, Doppler Spread and Coherence Time, Types of Small-Scale Fading-Fading effects Due to Multipath Time Delay Spread, Flat fading, Frequency selective fading, Fading effects Due to Doppler Spread-Fast fading, slow fading, Statistical Models for multipath Fading Channels-Clarke's model for flat fading, spectral shape due to Doppler spread in Clarke's model, Simulation of Clarke and Gans Fading Model, Level crossing and fading statistics, Two-ray Rayleigh Fading Model.

UNIT - IV

WI-FI AND THE IEEE 802.11 WIRELESS LAN STANDARD: IEEE 802 Architecture, IEEE 802.11 Architecture and Services, 802.11 Medium Access Control, 802.11 Physical Layer, Other IEEE 802.11 Standards, Wi-Fi Protected Access.

BLUETOOTH AND IEEE 802.15: Overview, radio specification, baseband specification, link manager specification, logical link control and adaptation protocol, IEEE 802.15.

UNIT - V

MOBILE DATA NETWORKS: Introduction, data oriented CDPD network, GPRS and higher data rates, short messaging service in GSM, mobile application protocols.

WIRELESS ATM & HIPERLAN: Introduction, Wireless ATM, HIPERLAN, HIPERLAN-2.

TEXT BOOKS:

1. Theodore S. Rappaport (2002), *Wireless Communications - Principles Practice,* 2nd edition, Prentice Hall of India, New Delhi.
2. William Stallings (2009), *Wireless Communications and Networks,* 2nd edition, Pearson Education, India.
3. Kaveh PahLaven, Prashanth Krishna Murthy (2007), *Principles of Wireless Networks - A Unified Approach*, Pearson Education, India.

REFERENCE BOOKS:

1. Dr. Kamilo Feher (2003), *Wireless Digital Communications,* Prentice Hall of India, New Delhi.
2. Jochen Schiller (2009), *Mobile Communications*, 2nd edition, Pearson Education, India.
3. Andreas F. Molisch (2006), *Wireless Communications*, Wiley – India, New Delhi.

Course Outcomes:

- Understand the principles of wireless communications.
- Understand fundamentals of wireless networking
- Understand cellular system design concepts.
- Analyze various multiple access schemes used in wireless communication.
- Understand wireless wide area networks and their performance analysis.
- Demonstrate wireless local area networks and their specifications.
- Familiar with some of the existing and emerging wireless standards.
- Understand the concept of orthogonal frequency division multiplexing.

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DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES
(ELECTIVE – V)

Course Objectives:

- To recall digital transform techniques.
- To introduce architectural features of programmable DSP Processors of TI and Analog Devices..
- To give practical examples of DSP Processor architectures for better understanding.
- To develop the programing knowledge using Instruction set of DSP Processors.
- To understand interfacing techniques to memory and I/O devices.

UNIT –I:

Introduction to Digital Signal Processing

Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation.

Computational Accuracy in DSP Implementations

Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

UNIT –II:

Architectures for Programmable DSP Devices

Basic Architectural features, DSP Computational Building Blocks, Bus Architecture and Memory, Data Addressing Capabilities, Address Generation Unit, Programmability and Program Execution, Speed Issues, Features for External interfacing.

UNIT -III:

Programmable Digital Signal Processors

Commercial Digital signal-processing Devices, Data Addressing modes of TMS320C54XX DSPs, Data Addressing modes of TMS320C54XX Processors, Memory space of TMS320C54XX Processors, Program Control, TMS320C54XX instructions and Programming, On-Chip Peripherals, Interrupts of TMS320C54XX processors, Pipeline Operation of TMS320C54XX Processors.

UNIT –IV:

Analog Devices Family of DSP Devices:

Analog Devices Family of DSP Devices – ALU and MAC block diagram, Shifter Instruction, Base Architecture of ADSP 2100, ADSP-2181 high performance Processor.

Introduction to Blackfin Processor - The Blackfin Processor, Introduction to Micro Signal Architecture, Overview of Hardware Processing Units and Register files, Address Arithmetic Unit, Control Unit, Bus Architecture and Memory, Basic Peripherals.

UNIT –V:

Interfacing Memory and I/O Peripherals to Programmable DSP Devices

Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA).

TEXT BOOKS:

1. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
2. A Practical Approach To Digital Signal Processing - K Padmanabhan, R. Vijayarajeswaran, Ananthi. S, New Age International, 2006/2009
3. Embedded Signal Processing with the Micro Signal Architecture Publisher: Woon-Seng Gan, Sen M. Kuo, Wiley-IEEE Press, 2007

REFERENCE BOOKS:

1. Digital Signal Processors, Architecture, Programming and Applications – B. Venkataramani and M. Bhaskar, 2002, TMH.
2. Digital Signal Processing – Jonatham Stein, 2005, John Wiley.
3. DSP Processor Fundamentals, Architectures & Features – Lapsley et al. 2000, S. Chand & Co.
4. Digital Signal Processing Applications Using the ADSP-2100 Family by The Applications Engineering Staff of Analog Devices, DSP Division, Edited by Amy Mar, PHI
5. The Scientist and Engineer's Guide to Digital Signal Processing by Steven W. Smith, Ph.D., California Technical Publishing, ISBN 0-9660176-3-3, 1997
6. Embedded Media Processing by David J. Katz and Rick Gentile of Analog Devices, Newnes , ISBN 0750679123, 2005.

Course Outcomes:

- Be able to distinguish between the architectural features of General purpose processors and DSP processors.
- Understand the architectures of TMS320C54xx and ADSP 2100 DSP devices.
- Be able to write simple assembly language programs using instruction set of TMS320C54xx.
- Can interface various devices to DSP Processors.

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RF CIRCUIT DESIGN
(ELECTIVE-V)

Course Objectives:

- To educate students fundamental RF circuit and system design skills.
- To introduce students the basic transmission line theory, single and multiport networks, RF component modelling.
- To offer students experience on designing matching and biasing networks & RF transistor amplifier design.

UNIT-I:

Introduction:

Importance of RF Design-Dimensions and Units-Frequency Spectrum-RF Behavior of Passive Components: High Frequency Resistors, High Frequency Capacitors, High Frequency Inductors.-Chip Components and Circuit Board Considerations: Chip Resistors, Chip Capacitors, and Surface Mount Inductors.

Review of Transmission Lines:

Types of Transmission Lines-Equivalent Circuit representation-R, L, C, G parameters of Different Line configurations-Terminated Lossless Transmission Lines-Special Terminations: Short Circuit, Open Circuit and Quarter Wave Transmission Lines- Sourced and Loaded Transmission Lines: Power Considerations, Input Impedance Matching, Return Loss and Insertion Loss.

UNIT-II:

Single and Multi-Port Networks:

The Smith Chart: Reflection Coefficient, Normalized Impedance-Impedance Transformation: Standing wave Ratio, Special Transformation Conditions-Admittance Transformation-Parallel and Series RL & RC Connections-Basic Definitions of Single and Multi-Port Networks-Interconnecting Networks.

RF Filter Design:

Scattering Parameters: Definition, Meaning, Chain Scattering Matrix, Conversion Between S- and Z-parameters, Signal Flow Chart Modeling, Generalization-Basic Resonator and Filter Configurations: Low Pass, High Pass, Band Pass and Band Stop type Filters-Filter Implementation using Unit Element and Kuroda's Identities Transformations-Coupled Filters.

UNIT-III:

Active RF Component Modelling:

RF Diode Models: Nonlinear and Linear Models-Transistor Models: Large Signal and Small Signal BJT Models, Large Signal and Small Signal FET Models- Scattering Parameter, Device Characterization.

UNIT-IV:

Matching and Biasing Networks:

Impedance Matching Using Discrete Components: Two Component Matching Networks, Forbidden Regions, Frequency Response and Quality Factor, T and Pi Matching Networks-Amplifier Classes of Operation and Biasing Networks: Classes of Operation and Efficiency of Amplifiers, Biasing Networks for BJT, Biasing Networks for FET.

UNIT-V:

RF Transistor Amplifier Design:

Characteristics of Amplifiers- Amplifier Power Relations: RF Source, Transducer Power Gain, Additional Power Relations-Stability Considerations: Stability Circles, Unconditional Stability, And Stabilization Methods-Unilateral and Bilateral Design for Constant Gain- Noise Figure Circles- Constant VSWR Circles.

RF Oscillators and Mixers:

Basic Oscillator Model: Negative Resistance Oscillator, Feedback Oscillator Design, Design steps, Quartz Oscillators- Fixed Frequency High Frequency Oscillator -Basic Characteristics of Mixers: Concepts, Frequency Domain Considerations, Single Ended Mixer Design, Single and Double Balanced Mixers.

TEXT BOOKS:

1. RF Circuit Design – Theory and Applications - Reinhold Ludwig, Pavel Bsetchko – Pearson Education India, 2000.
2. Radio Frequency and Microwave Communication Circuits – Analysis and Design - Devendra K.Misra – Wiley Student Edition – John Wiley & Sons, Inc.

REFERENCE BOOKS:

1. Radio Frequency and Microwave Electronics – Matthew M. Radmanesh – PEI.
2. RF Circuit Design – Christopher Bowick, Cheryl Aljuni and John Biyler, Elsevier Science, 2008.
3. Secrets of RF Circuit Design - Joseph J.Carr, TMH, 2000.
4. Design of RF and Microwave Amplifiersand Oscillators - Peter L.D. Abrif, Artech House, 2000.
5. The Design of CMOS Radio Frequency Integrated Circuits - Thomas H.Lee , 2/e – Cambridge University Press, 2004.

Course Outcomes:

- Explore fundamental RF circuit and system design skills.
- Understand the basic transmission line theory, single and multiport networks, RF component modelling.
- Design matching and biasing networks & RF transistor amplifiers.

2014-2015 **Code: 40428**

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INDUSTRY ORIENTED MINI PROJECT

2014-2015 **Code: 40429**

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TECHNICAL SEMINAR

2014-2015 **Code: 40430**

MALLA REDDY ENGINEERING COLLEGE
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MAJOR PROJECT

2014-2015 **Code: 40431**

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COMPREHENSIVE VIVA