RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY

AUTONOMOUS

NANDYAL-518501, KURNOOL DIST., A.P., INDIA

ELECTRONICS AND COMMUNICATION ENGINEERING

ESTD: 1995

II, III & IV B.Tech SYLLABUS

Applicable for students admitted into B.Tech (Regular) from 2012-13

&

B.Tech (Lateral Entry Scheme) from 2013-14

REGULATIONS, COURSE STRUCTURE & DETAILED SYLLABUS

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGINEERING AND TECHNOLOGY,
NANDYAL-518501, KURNOOL (DIST), A.P., INDIA

AUTONOMOUS INSTITUTE

(Affiliated to J.N.T.U.A, Anantapur)

ACADEMIC REGULATIONS, COURSE STRUCTURE AND DETAILED SYLLABI

B.Tech (Regular) from 2012-13 and B.Tech (Lateral Entry Scheme) from 2013-14

For pursuing four year under graduate Bachelor Degree Programme of study in Engineering (B.Tech), Two year Master (post graduate) Degree of study in Engineering (M.Tech), Two year Master (post graduate) degree of study in Business Administration (MBA), Three year Master (post graduate) Degree of study in Computer Applications (MCA) offered by Rajeev Gandhi Memorial College of Engineering and Technology, Nandyal - 518501 under Autonomous status and herein referred to as RGMCET (Autonomous):

All the rules specified herein approved by the Academic Council will be in force and applicable to students admitted from the Academic Year 2012-13 onwards. Any reference to "Institute" or "College" in these rules and regulations shall stand for Rajeev Gandhi Memorial College of Engineering and Technology (Autonomous).

All the rules and regulations, specified hereafter shall be read as a whole for the purpose of interpretation as and when a doubt arises, the interpretation of the Chairman, Academic Council is final. As per the requirements of statutory bodies, the Principal, Rajeev Gandhi Memorial College of Engineering and Technology shall be the Chairman, Academic Council.

The candidate seeking admission into the first year of study of four year B.Tech degree Programme should have

i) Passed either Intermediate Public Examination (IPE) conducted by the Board of Intermediate Education, Andhra Pradesh with Mathematics, Physics and chemistry as optional subjects (or any equivalent examination certified by Board of Intermediate Examinations) or a Diploma in Engineering in the relevant branch conducted by the Board of Technical Education, Andhra Pradesh (or any equivalent certified by State Board of Technical Education) for admission.

ii) Secured a rank in the EAMCET examination conducted by AP State Council for Higher Education (APSCHE) for allotment of a seat by the Convener, EAMCET, for admission.

Admission Procedure:

As per the norms of A.P. State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made to the first year of Four year B.Tech. Degree programme as follows:-

a) As per the norms of Government of Andhra Pradesh, A-Category (based on the rank obtained in EAMCET) seats will be filled by the Convener, EAMCET.

b) As per the norms of Government of Andhra Pradesh, B-Category seats will be filled by the management.

Admission to the Second year of Four year B.Tech. Degree Programme in Engineering:

i) Candidates qualified in ECET and admitted by the Convener, ECET, in such cases for admission, when needed permission from the statutory bodies is to be obtained.

ii) 20% of the sanctioned strength in each programme of study (of RGMCET) shall be filled by the Convener, ECET as lateral entry.

List of Programs offered

1. B.Tech – Regular (& Lateral Entry)
2. M.Tech – Regular
3. MBA – Regular
4. MCA – Regular

Academic Regulations for 2012 B. Tech (Regular)

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

The B.Tech degree will be conferred by the Jawaharlal Nehru Technological University, Anantapur, to those students who are admitted to the program and fulfil all the requirements for the award of the Degree as specified below.

1.0 Award of B.Tech. Degree

1.1 The student will be declared eligible for the award of the B. Tech. degree if he fulfils the following academic regulations:

1.2 Pursued a course of study for not less than prescribed course work duration and not more than double the prescribed course work duration.

1.3 Registered for 196 credits and secured 190 credits with compulsory subjects as listed in Table-1 below.

Table 1: Compulsory Subjects

S.NO	SUBJECT PARTICULARS
1.	All the first year subjects
2.	All practical subjects
3.	Skill Development Courses
4.	Mini project
5.	Seminar
6	Comprehensive viva voce
7.	Project work

2.0 Forfeit of seat

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

3.0 Courses of study

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

1. Civil Engineering.
2. Computer Science and Engineering.
3. Electrical and Electronics Engineering.
4. Electronics and Communication Engineering.
5. Electronics and Instrumentation Engineering.
6. Information Technology.
7. Mechanical Engineering.

and any other course as approved by the authorities of the University from time to time.

Table 2: Credits

	I Year				Semester			
	Periods /Week	Credits	Internal Marks	External Marks	Periods / Week	Credits	Internal Marks	External Marks
Theory	02	02	30	70	04	03	30	70
	03	03	30	70				
	03+1*	03	30	70				
	03+1*	04 or 05	30	70				
Practical	03	03	25	50	03	02	25	50
Practical / Drawing	3+1*	02			06	03		
	06	04	30	70			30	70
Skill Development Courses	03					02**	100	
Mini Project						02	25	50
Seminar						02	50	
Comprehensive Viva-voce						03		50
Project						10	50	100

[*Tutorial

****Skill Development Courses credits will not be considered for the award of division. However all these courses have to be cleared through Internal evaluation by scoring minimum of 40%.The credits obtained in these courses will be taken in to account for award of degree.]**

4.0 Distribution and Weightage of Marks

4.1 The performance of the student in each semester / I year shall be evaluated subject – wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, mini-project, comprehensive viva, seminar shall be evaluated for 50 marks each and the project work shall be evaluated for 150 marks.

4.2 For theory subjects the distribution shall be 30 marks for Internal Evaluation (25 marks for Internal test and 05 marks for assignments) and 70 marks for the End-Examination.

4.3 For the semester system, during the semester there shall be 2 tests for theory subjects. In each Internal test there shall be one compulsory (short answers) question and 3 descriptive questions are to be answered. The duration of Internal test will be for 2hrs. First test to be conducted in 3 units and second test to be conducted in remaining 3 units of each subject. For awarding of 25 Internal marks the performance of the student in two Internal examinations conducted one in the middle of the semester and the other towards the end of the semester giving a weightage of 0.75 for the better score and 0.25 for the other score will be considered. There shall be two assignments (problem based) in each semester for award of 05 marks so that Internal component (marks) will be 30 marks (25 marks for Internal test+05 marks for assignments).

4.4 For the I year class which shall be on yearly basis, there shall be 3 tests. For awarding of 25 Internal marks the performance of the student in three Internal examinations conducted as per the schedule giving a weightage of 0.5 for the best score, 0.25 for better score and 0.25 for the other score will be considered. The distribution of syllabus for the conduct of Internal tests in the first year shall be as follows:

Table 3: Units for Internal Tests

I Year	Semester
2 Units First Internal test. 2 Units Second Internal test. 2 Units Third Internal test.	3 Units First Internal test. 3 Units Second Internal test.

In a year there shall be at least three assignments and in each semester there shall be two assignments for the award of 5 marks.

4.5 In the case of Skill Development Coursestwo Internal examinations shall be conducted one in the middle of the semester and the other at the end of the semester for 70 marks and the marks scored by the student in these exams with a weightage of 0.75 for better score and 0.25 for the other score will be awarded as Internal marks for 70.The remaining 30 marks are based on the average marks scored in two assignment. No external exam for these courses.

4.6 No makeup test for Internal examination or assignments will be conducted in any subject or practical. The student, who is absent for any test shall be deemed to have scored zero in that test.

5.0 Question Paper Pattern:

5.1 Each Internal Test question paper shall contain 5 questions, of which the First question is compulsory and three questions are to be answered from the remaining four. Compulsory question carries 10 marks (It contains 5 questions of two marks - no choice in first question). The remaining 3 questions carry 5 marks each.

5.2 The End Examination question paper will have 7 questions and students have to write 5 questions. However, the first question is compulsory and it consists of 7 short answer questions, each carrying 2 marks. The next 4 questions are to be answered from the remaining 6 questions and each carries 14 marks.

5.3 For practical subjects there shall be a continuous evaluation during the semester for 25 Internal marks and 50 End Examination marks. Of the 25 marks for Internal, 20 marks shall be awarded for day-to-day work and 5 marks to be awarded by conducting an Internal laboratory test. The End Examination shall be conducted by the teacher concerned and an external Examiner from other institutions.

5.4 For the subject having design and / or drawing, (such as Engineering Graphics, Machine Drawing etc) and estimation, the distribution shall be 30 marks for Internal evaluation (15 marks for day-to-day work and 5 marks for Internal tests and 10 marks for assignments) and 70 marks for End Examination. There shall be two Internal tests in a Semester and the best of the two shall be considered for the award of marks for Internal tests. However in the I year class, there shall be three Internal tests and the average of best two will be taken into consideration for award of Internal marks.

5.5 The Engineering Drawing Practice Lab, wherever offered is to be treated as a theory subject. Evaluation method adopted for theory subjects shall be followed here as well.

5.6 There shall be mini-Project, in collaboration with an industry (wherever possible) of their specialization, to be taken up during the vacation(data collection, components etc) after III year II Semester examination and implementation/simulation shall be carried out in IV year first semester during lab classes. Implementation or construction of mini project will be treated as laboratory. However, the mini project and its report shall be evaluated in IV year I Semester. The mini project shall be submitted in report form and should be presented before the committee, which shall be evaluated for 50 marks. The committee consists of an external Examiner, Head of the Department, the supervisor of mini project and a senior faculty

member of the Department. There shall be 25 Internal marks for mini project which will be awarded based on the performance and involvement of the student during mini project period.

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

5.8 There shall be a comprehensive viva voce examination at the end of IV year II semester for 50 marks which shall be conducted by HOD, senior faculty and external Examiner from other institute.

5.9 The project topic should be approved by Internal Department Committee (IDC). Out of total 150 marks for the project work, 50 marks shall be for Internal Evaluation and 100 marks for the End Semester Examination. The evaluation of project work shall be conducted at the end of the IV year II semester. The project viva voce examination will be conducted by the committee consists of an external Examiner from other institute, Head of the Department and the supervisor of the project. The Internal evaluation for 50 marks shall be on the basis of two seminars given by each student on the topic of the project. The Internal evaluation of the project work for 50 marks shall be conducted by the committee consists of head of the Department or his nominee, senior faculty member and the supervisor of project.

Table4: Distribution of weightages for examination and evaluation:

S.No	Nature of subject	Marks	Type of examination and mode of assessment		Scheme of Examination
1	Theory	70	End Examination Double Evaluation (Internal+External evaluation)		End Examination in theory subjects will be for 70 marks.
		30	25	Internal examinations (Internal evaluation)	These 25 marks are awarded to the students based on the performance in three(yearly) or two(semester) Internal examinations with a weightage of 0.5 for best score ,0.25 for better score, 0.25 for other score (yearly) and 0.75 for better score and 0.25 for the other score(semester) respectively.
			05	Assignments (Internal evaluation)	Average of Three/two assignments in a year/ semester each of 05 marks.
2	Practical	50	End lab examination (External evaluation)		This End Examination in practical subjects will be for a maximum of 50 marks.
		25	20	Internal evaluation	Day-to-day performance in lab experiments and record
			05	Internal evaluation	Internal lab examination at the end of year/semester
3	Mini Project	50	End Examination (External evaluation)		This End Examination in miniproject will be for a maximum of 50 marks.
		25	Internal evaluation		Day-to-day performance in executing mini project .
4	Seminar	50	Internal evaluation		Based on the performance in two seminars during semester
5	Comprehensive Viva	50	External evaluation		This end viva voce examinations in all the subjects for 50 marks
6	Project work	100	External evaluation		This end viva voce in project work for 100 marks
		50	Internal evaluation		These 50 marks will be based on the performance of the student in the project reviews apart from attendance and regularity
7	Skill Development Courses	70	Internal evaluation		These 70 marks are awarded to the students based on the performance of two Internal examinations with a weightage of 0.75 for better score and 0.25 for the other score
		30	Internal evaluation		Based on the two assignments

6.0 Attendance Requirements:

6.1 The student shall be eligible to appear for End Examinations of the semester/ year if he acquires a minimum of 75% of attendance in aggregate of all the subjects of that semester/year.

6.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in a semester / year may be granted by the College Academic Committee.

6.3 The student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / year, as applicable. They may seek re-admission for that semester / year when offered next.

6.4 **Shortage of Attendance below 65% in aggregate shall in <u>NO</u> case be condoned.**

6.5 Students whose shortage of attendance is not condoned in any semester / year are not eligible to take their End Examination of that class and their registration shall stand cancelled.

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

7.0 Minimum Academic Requirements:

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no.6.0.

7.1 The student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical or design or drawing subject or Skill Development Courses or project if he secures not less than 35% of marks in the End Examination and he has to score minimum of 40% marks from Internal and external exam marks put together to clear the subject.

7.2 The student shall be promoted from II to III year only if he fulfils the academic requirement of securing 46 out of 92 credits from all the exams conducted upto and including II year II semester regular examinations **(Two regular and one supplementary examinations of I year; one regular and one supplementary examinations of II year I semester; one regular examination of II year II semester)** irrespective of whether the candidate takes the examination or not.

7.3 The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of securing total 72 out of 144 credits from all the exams conducted upto and including III year II semester regular examinations ,whether the candidate takes the examinations or not. (**Three regular and two supplementary examinations of I year; Two regular and two supplementary examinations of II year I semester ; Two regular and one supplementary examinations of II year II semester ; One regular and one supplementary examination of III year I semester ; One regular examination of III year II semester)**

Table 5: Promotion rules

Promotion from	Total credits to register	Total credits to obtain for promotion
II yr to III yr	92	46
III yr to IV yr	144	72

7.4 The student shall register and put up minimum attendance in all 196 credits and earn the 190credits. Marks obtained in the best 178 credits (excluding the credits obtained in Skill Development Courses) shall be considered for the calculation of percentage of marks.

7.5 Students who fail to earn 190 credits as indicated in the course structure including compulsory subjects as indicated in Table-1 within eight academic years from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.

8.0 Course pattern:

8.1 The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years shall be on semester pattern.

8.2 The student is eligible to appear for the End Examination in a subject, but absent at it or has failed in the End Examination may appear for that subject at the supplementary examination.

Table: 6: Course pattern

Year	Semester	No. of Subjects	No. of Skill Development Courses	Number of Labs	Total credits	
First year		O7 {ENG-3 EP-4, EC-4, M1-4, MM/EM-4, CP-5,ED-4}	00	04	1X3=03 4X5=20 5X1=05 4X3=12	40
Second year	First	06	01	03	6X3=18 1X2=02 3x2=06	26
	Second	06	01	03	6X3=18 1X2=02 3x2=06	26
Third year	First	06	01	03	6X3=18 1X2=02 3x2=06	26
	Second	06	01	03	6X3=18 1X2=02 3x2=06	26
Fourth year	First	06	01	02 Mini project	6X3=18 1X2=02 3x2=06	26
	Second	03	01	Subjects Open elective Seminar Comprehensive Viva Project Viva	3x3 =09 1X2=02 1X2=02 1X3=03 1X10=10	26
GRAND TOTAL						196

9.0 Transitory Regulations:

Candidates who have been detained for want of attendance or not fulfilled academic requirements or who have failed after having undergone this course in earlier regulations or have discontinued and wish to continue the course are eligible for admission into the unfinished semester from the date of commencement of class work with the same or equivalent subjects as and when subjects are offered subject to section 2.0 and they continues to be in the academic regulations they were first admitted.

10.0 With-holding of results:

If the candidate has any dues not paid to the Institute or if any case of indiscipline of malpractice is pending against him, the result of the candidate shall be withheld and he will not be allowed/promoted into the next higher semester. The issue of degree is liable to be withheld in such cases.

11.0 Award of Class:

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

Table 7: Award of Division

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for the best 178 Credits (excluding Skill Development Courses)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in Internal evaluation and End Examination shall be shown separately in the marks memorandum)

11.0 Supplementary Examinations:

Apart from the regular End Examinations the institute may also schedule and conduct supplementary examinations for all subjects for the benefit of students with backlogs. Such students writing supplementary examinations as supplementary candidates may have to write more than one examination per day.

12.0 Transcripts:

After successful completion of prerequisite credits for the award of degree a Transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued if required after the payment of requisite fee and also as per norms in vogue.

13.0 Rules of Discipline:

12.1 Any attempt by any student to influence the teachers, Examiners, faculty and staff of controller of Examination for undue favours in the exams, and bribing them either for marks or attendance will be treated as malpractice cases and the student can be debarred from the college.

12.2 When the student absents himself, he is treated as to have appeared and obtained zero marks in that subject(s) and grading is done accordingly.

12.3 When the performance of the student in any subject(s) is cancelled as a punishment for indiscipline, he is awarded zero marks in that subject(s).

12.4 When the student's answer book is confiscated for any kind of attempted or suspected malpractice the decision of the Examiner is final.

14.0 Minimum Instruction Days:

The minimum instruction days for each semester / I year shall be 95/180 clear instruction days excluding the days allotted for tests/examinations and preparation holidays declared if any.

15.0 Amendment of Regulations:

The college may, from time to time, revise, amend or change the regulations, scheme of examinations and syllabi. However the academic regulations of any student will be same throughout the course of study in which the student has been admitted.

16.0 Transfers

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

17. 0 General:

16.1 The Academic Regulation should be read as a whole for the purpose of any interpretation.

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

16.3 The Institute 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 Institute.

16.4 Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

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

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

1.0 The Students have to acquire 150 credits out of 156 from II to IV year of B.Tech. Program (Regular) for the award of the degree.

2.0 Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.

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

4.0 **Promotion Rule:**

The student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 52 out of 104 credits from all the exams conducted upto and including III year II semester regular examinations, whether the candidate takes the examinations or not. (**Two regular and Two supplementary examinations of II year I semester; Two regular and one supplementary examinations of II year II semester; One regular and one supplementary examination of III year I semester; One regular examination of III year II semester**).

5.0 **Award of Class:**

After the 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: The marks obtained in the best 138 credits will be considered for the calculation of percentage and award of class.

Table 1: Award of Division

Class Awarded	% of marks to be secured	
First Class with Distinction	70% and above	From the aggregate marks secured for best 138 Credits. (i.e. II year to IV year) excluding Skill Development Courses
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in Internal evaluation and End Examination shall be shown separately in the marks memorandum)

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

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I B.Tech

COURSE STRUCTURE

(Common to Branches: ECE, EEE, EIE, CSE & IT)

Code	Subject	Scheme of instruction periods/week		Credits	Scheme of Examination		
		Theory	Practical		Internal Marks	External Marks	Total Marks
Theory							
A0001121	Professional English	3+1*	-	3	30	70	100
A0002121	Engineering Physics	3+1*	-	4	30	70	100
A0003121	Engineering Chemistry	3+1*	-	4	30	70	100
A0004121	Mathematics – I	3+1*	-	4	30	70	100
A0005121	Mathematical Methods	3+1*	-	4	30	70	100
A0501121	Fundamentals of Computers & C Programming	3+1*	-	5	30	70	100
A0301121	Engineering Drawing	6	-	4	30	70	100
Practical							
A0591121	Computer Programming Lab	-	3	3	25	50	75
A0391121	Engineering and IT Workshop	-	3	3	25	50	75
A0091121	Engineering Physics Lab and Engineering Chemistry Lab	-	3	3	25	50	75
A0092121	English Language Communication Skills Lab	-	3	3	25	50	75
	Total	**30**	**12**	**40**	**310**	**690**	**1000**

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II B.TECH, I-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0008123	Mathematics – III	3	1	-	3	30	70	100
A0010123	Environmental Studies	3	1	-	3	30	70	100
A0401123	Electronic Devices and Circuits	3	1	-	3	30	70	100
A0402123	Signals and Systems	3	1	-	3	30	70	100
A0205123	Network Analysis	3	1	-	3	30	70	100
A0011123	Managerial Economics and Financial Analysis	3	1	-	3	30	70	100
SKILL DEVELOPMENT COURSE								
A0007123	Aptitude Arithmetic Reasoning and Comprehension	3	-	-	2	30+70	-	100
PRACTICALS								
A0491123	Electronic Devices and Circuits Lab	-	-	3	2	25	50	75
A0492123	Signals and Systems Simulation Lab	-	-	3	2	25	50	75
A0293123	Network Analysis Lab	-	-	3	2	25	50	75
	Contact Periods / Week	**21**	**6**	**9**	**26**	**355**	**570**	**925**

II B.TECH, II-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0405124	Random variables and Random Processes	3	1	-	3	30	70	100
A0212124	Electrical Technology	3	1	-	3	30	70	100
A0406124	EM Waves and Transmission Lines	3	1	-	3	30	70	100
A0407124	Electronic Circuit Analysis	3	1	-	3	30	70	100
A0408124	Pulse and Digital Circuits	3	1	-	3	30	70	100
A0404124	Switching Theory and Logic Design	3	1	-	3	30	70	100
SKILL DEVELOPMENT COURSE								
A0009123	Corporate Management Skills	3	-	-	2	30+70	-	100
PRACTICALS								
A0493124	Electronic Circuit Analysis Lab	-	-	3	2	25	50	75
A0494124	Pulse and Digital Circuits Lab	-	-	3	2	25	50	75
A0298124	Electrical Technology Lab	-	-	3	2	25	50	75
	Contact Periods / Week	**21**	**6**	**9**	**26**	**355**	**570**	**925**

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III B.TECH, I-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0411125	Analog Communications	3	1	-	3	30	70	100
A0210124	Control Systems	3	1	-	3	30	70	100
A0412125	Antennas and Wave Propagation	3	1	-	3	30	70	100
A0413125	Analog IC Applications	3	1	-	3	30	70	100
A1210125	Computer Organization	3	1	-	3	30	70	100
A0410125	Microprocessors & Microcontrollers	3	1	-	3	30	70	100
SKILL DEVELOPMENT COURSE								
A0013125	Professional Ethics and soft skills	3	-		2	30+70	-	100
PRACTICALS								
A0496125	Analog Communications Lab	-	-	3	2	25	50	75
A0497125	Microprocessors and Microcontrollers Lab Using Embedded 'C'	-	-	3	2	25	50	75
A0498125	Analog IC Applications Lab	-	-	3	2	25	50	75
Contact Periods / Week		**21**	**6**	**9**	**26**	**355**	**570**	**925**

III B.TECH, II-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0416126	Digital Signal Processing	3	1	-	3	30	70	100
A0417126	Micro Electronics and VLSI Design	3	1	-	3	30	70	100
A0506124	Object Oriented Programming	3	1	-	3	30	70	100
A0418126	Microwave Engineering	3	1	-	3	30	70	100
A0415125	Digital IC Applications through VHDL	3	1	-	3	30	70	100
A0419126	Digital Communications	3	1	-	3	30	70	100
SKILL DEVELOPMENT COURSE								
A0432126	Embedded 'C'	3	-	-	2	30+70	-	100
PRACTICALS								
A0595124	Object Oriented Programming Lab	-	-	3	2	25	50	75
A0482126	Digital Communications Lab	-	-	3	2	25	50	75
A0483126	Digital IC Applications Using VHDL & Verilog Lab	-	-	3	2	25	50	75
	Contact Periods / Week	**21**	**6**	**9**	**26**	**355**	**570**	**925**

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV B.TECH, I-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
THEORY								
A0014125	Management Science	3	1	-	3	30	70	100
A0421127	Electronic Measurements and Instrumentation	3	1	-	3	30	70	100
A0422127	Optical Communications	3	1	-	3	30	70	100
A0423127	Digital Image Processing	3	1	-	3	30	70	100
	Elective-I	3	1	-	3	30	70	100
	Elective-II	3	1	-	3	30	70	100
SKILL DEVELOPMENT COURSE								
A0427127	Verilog	3	-		2	30+70	-	100
PRACTICALS								
A0485127	Digital Signal & Image Processing Lab	-	-	3	2	25	50	75
A0486127	Microwave & Optical Communications Lab	-	-	3	2	25	50	75
A0487127	Mini Project	-	-	3	2	25	50	75
	Contact Periods / Week	**21**	**6**	**9**	**26**	**355**	**570**	**925**

IV B.TECH, II-SEMESTER COURSE STRUCTURE

Subject Code	Subject	Hours/ Week			Credits	Marks		
		Theory	Tutorial	Lab		Internal	External	Total
A0433128	Radar Systems	3	1	-	3	30	70	100
	Elective-III	3	1	-	3	30	70	100
	Elective-IV	3	1	-	3	30	70	100
A0438128	Microwind & Lab View (Skill Development Course)	3	-	-	2	30+70	-	100
A0489128	Seminar	-	-	-	2	50	-	50
A0490128	Comprehensive Viva	-	-	-	3	-	50	50
A0471128	Project	-	-	-	10	50	100	150
	Contact Periods / Week	**12**	**3**	**-**	**26**	**290**	**360**	**650**

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

ELECTIVES

SUBJECT CODE	ELECTIVES
ELECTIVE-I	
A0424127	Cellular and Mobile Communications
A0425127	Satellite Communications
A0426127	Spread Spectrum Communications
ELECTIVE-II	
A0509124	Operating Systems
A0521126	Unix and Shell programming
A0527127	Web Technologies & Programming
ELECTIVE-III	
A0511125	Computer Networks
A0434128	DSP Processors Architectures and Applications
A0435128	Mixed Signal Design
ELECTIVE-IV	
A0436128	Wireless Communications and Networks.
A0437128	FPGA Architecture and Applications.
A0440128	Nano Electronics

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGG.& TECH., NANDYAL-518 501

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

I B.Tech (ECE) T 3+1* C 3

(A0001121) PROFESSIONAL ENGLISH

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

OBJECTIVES:

The recent two decades have witnessed a great upsurge of job opportunities for student holding Engineering Graduate degree, in ever increasing number of Engineering and Management Colleges, in outsourcing sector, in Marketing jobs and of course, in the colleges and universities. A student, able to communicate in fluent English is liable to achieve success in every walk of life – be it professional, social or economical. The syllabus has been designed keeping in view of the track record, needs and goals of the generation next undergraduates. It comprises essentials of language development along with technical, social, environmental & spiritual aspects which in turn mould students as dynamic professionals. The course of Professional English has been designed with the following objectives.

- To ignite the spark of professionalism among students with the purpose to acquire success in every walk of life.
- To enable them to accomplish effective Technical writing
- To focus on complete language basics through LSRW skills
- To develop critical thinking skills and emotions of students through inspiring and literary texts.
- To eliminate the errors of language by practical English usage patterns and to improve the performance of students in English. This will facilitate students to be more articulate and confident. By this, new vistas of better job opportunities can be opened up for them.
- The greatest contribution of this course shall be to chisel Communicative skills of students at the global level.

OUTCOMES:

- Be able to acquire basic vocabulary.
- Be able to use mechanics of writing.
- Be able to develop language proficiency & Grammar usage.
- Considerable improvement in LSRW skills and communicative ability.
- Increase in motivational level and Professional attitudes.
- Be able to possess wide range of relevant knowledge.

UNIT I

A.Reading: i) Developing Personality - Principles & Strategies– by J.R.Bhatti
ii) Inspiring Lives – Mokshagundam Visvesvaraya

B.Writing: Mechanics of Writing- Paragraph writing

C.Vocabulary -synonyms and antonyms

D. Language Development - Basics of Grammar – Naming Words- Concord

Student Tasks: Self analysis through questionnaires - Case Study on Successful Profiles.

UNIT II

A. Reading: i) Heaven's Gate by Pico Iyer
ii) Fish Philosophy – Enjoy Your Work by Harry Paul

B. Language Development: Tenses – Question Tags

C. Soft skills 1: The Art of Time Management by Gopala Swamy Ramesh & Mahadevan Ramash

UNIT III

A. Reading: i) Sir C.V. Raman – A Biography
ii) Inspiring Lives – Mother Theresa - Case Study – Joy of Giving.com

B. Writing: Letter Writing – Sample Analysis

C. Language Development: Discourse Markers

UNIT IV

A. Reading: i)Disaster Management -The Cuddalore Experience –Case study: Disaster Management - Japan Tsunami 2011.
ii) Neil Chambers' Green Living.
iii) Immortal Speeches – Mahatma Gandhi by Harsha Vardhan Datta

B. Writing: Report Writing

C. Language Development: Active & Passive Voice

UNIT V

A. Reading: i) Inspiring Lives - Viswanath Anand.
ii) Human Interest - The Connoisseur

B. Vocabulary – Idioms

C. Language Development – Direct & Indirect Speech

UNIT VI

A. Reading: i) Corporate Woman
ii) The Law of Pure. Potentiality by Deepak Chopra

B. Writing – Instruction Manuals – Checklists – Preventive Measures

C. Soft skills 2: Cross Cultural Communication-Profile of an Interculturally Effective Person (IEP).

TEXT BOOKS PRESCRIBED:

1. Enjoying EveryDay English by A.Ramakrishna Rao published by Sangam Books
2. Inspiring Lives published by Maruthi Publications

SUGGESTED READING:

- Practical English Usage (New Edition) by Michael Swan Oxford University Press
- Murphy's English Grammar (Third Edition) by Raymond Murphy Cambridge University Press 2004
- Technical writing 3rd edition by Sharon J. Gerson & Steven M. Gerson Pearson Education 2001
- The Dynamics of Successful Personality and projection (Second Edition) by– J.R. Bhatti, Pearson 2011

I B.Tech (ECE)

T	C
3+1*	4

(A0002121) ENGINEERING PHYSICS

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

COURSE OBJECTIVES

- To understand fundamental principles of engineering physics specifically concern to optics, crystal structures, quantum mechanics & electron theory of metals, semiconductors, nano materials, magnetic materials, dielectric properties, superconductivity, Laser, and optical fiber.
- To provide problem solving experience and learning of concepts through it in engineering physics, in both the classroom and the laboratory learning environment.

OUTCOMES:

By the end of the course students will be able to

- Acquire fundamental understanding of concepts specifically concern to quantum physics, crystallography, superconductivity, lasers and optical fibers and their engineering applications.
- Develop the ability to recognize the appropriate physics that applies to experiments based on the Engineering Physics
- To develop a systematic, logical approach to problem-solving that can be applied to problems in physics and to problems in general.

UNIT- I

WAVE OPTICS: Interference - Interference in thin films by reflection - Newton's rings - Diffraction - Fraunhofer diffraction at a single slit - Fraunhofer diffraction at a double slit - Diffraction grating - Grating spectrum – Polarization – Nicol prism – Theory of circular and elliptical polarized light – Quarter and half wave plates.

UNIT- II

CRYSTAL STRUCTURES: Introduction -Space lattice - Basis - Unit cell - Lattice parameter - Bravais lattices - Crystal systems - Structure Simple cubic - Body Centered Cubic – Face Centered Cubic crystals- Crystal structure of diamond-Miller indices of planes and directions in crystals – Separation between successive (h k l) planes – X-ray diffraction technique – Powder method.

UNIT- III

PRINCIPLES OF QUANTUM MECHANICS & ELECTRON THEORY: Waves and Particles - de-Broglie's hypothesis – Heisenberg's uncertainty principle - Schroedinger's one dimensional time independent wave equation (qualitative treatment) - Particle in a one dimensional potential box – Energy levels - Fermi-Dirac distribution and effect of Temperature (qualitative treatment only) –Source of electrical resistance – Kronig-Penney model (qualitative treatment only - energy bands – metals, semi conductors & insulators.

UNIT- IV

PHYSICS OF SEMICONDUCTORS: Intrinsic and extrinsic semiconductors – Law of mass action –Drift & diffusion - Einstein's relation – Hall Effect – p-n junction - Band diagram of p-n junction diode – Diode Equation- Solar cell and its applications.

NANO MATERIALS: Introduction - Basic principles of nano materials – properties of nano materials – Synthesis of Nanomaterials by Ball Mill method and Sol-Gel method - carbon nanotubes – properties and applications of carbon nano tubes - Applications of nano materials.

UNIT- V

MAGNETIC MATERIALS: Introduction - Origin of magnetic moment – Classification of magnetic materials - Dia, Para , Ferro, anti-Ferro and Ferri magnetism - Hysteresis - Soft and hard magnetic materials

DIELECTRIC PROPERTIES: Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizations (qualitative treatment only) - Local field - Clausius-Mossotti equation- Frequency dependence of polarisability (qualitative treatment only).

SUPERCONDUCTIVITY: General properties - Meissner effect - Penetration depth- Type I and Type II superconductors– Flux quantization- Josephson effects – Applications of superconductors.

UNIT- VI

LASERS: Introduction – Characteristics of laser - Spontaneous and stimulated emission of radiation - Einstein's coefficients - Population inversion - Ruby Laser - Helium-Neon Laser – GaAs Laser - Applications of Lasers.

FIBER OPTICS: Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture – Types of Optical fibers and refractive index profiles – Attenuation in optical fibers – Applications of optical fibers.

TEXT BOOKS:

1. Avadhanulu M N and Kshirsagar P G, "A Textbook of Engineering Physics", S. Chand & Company Ltd, New Delhi, 2005 (Unit – I, IV, VI).
2. S.P. Basavaraju, "Applied Physics", Subhas Stores, Books Corner, Bengaluru, 2008 (Unit II-VI).

REFERENCES:

1. R. K. Gaur and S.C. Gupta, 'Engineering Physics' Dhanpat Rai Publications, New Delhi (2003).
2. A Text Book of Optics by S.L. Kakani and K.C. Bhandari, Sultan Chand & Sons, Educational Publishers, New Delhi.
3. Physics Volume 2, by Halliday, Resnick and Krane; John Wiley India
4. Solid State Physics by C.Kittel, Wiley India
5. Introduction to Nanoscience & Nano Technology by K.K Chattopadhyay & A.N. Banarjee, Prentice – Hall of India Pvt. Ltd.

I B.Tech (ECE) T 3+1* C 4

(A0003121) ENGINEERING CHEMISTRY

(Common to all Branches)
For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

OBJECTIVES:

Chemistry is concerned with the changes of matter with its environment. The introduction of Engineering Chemistry to I B.Tech students to know the basic principles, concepts and familiarize the materials used in industries and software technologies .This will help the students to cope up with the continuous flow of new technology.

The importance of water and sustainable utilization of water resources and alternative methods for freshwaters like Reverse osmosis and the problems raised in the production of steam by using the boilers are included in Water technology.

The present syllabus aims to impart in-depth knowledge of the subject and highlight the role of chemistry in the field of engineering. The lucid explanation of the topics will help students understand the fundamental concepts and apply them to design engineering materials and solve problems related to them. An attempt has been made to logically correlate the topic with its application. The extension of fundamentals of electrochemistry to energy storage devices such as commercial batteries and fuel cells is one such example. The also include a comprehensive coverage of topics of applied chemistry including polymers, engineering materials, corrosion its control.

UNIT I:

Water Chemistry: Introduction- Impurities in Water, Water Quality Parameters and Standards, Water Analysis-Determination of different Constituents in water – Hardness, Alkalinity, Dissolved Oxygen, TDS. Numerical Problems on hardnes, Boiler Troubles-Scales and Sludges, Carry over, Boiler Corrosion, Caustic Embrittlement.

Water Treatment: Municipal Water treatment for domestical purpose, Desalination of Water –Reverse Osmosis.

UNIT II:

Electrochemistry: Conductance - Specific Conductance, Equivalent Conductance Molar Conductance - Effect of Dilution.

Electrochemical Cells: Reference Electrodes–Standard Hydrogen Electrode, Calomel electrode, Measurement of EMF, Standard electrode potential, Galvanic cells, concentration cells.

Ion Selective Electrodes-Principle, Chemistry and working of Electrodes - Applications for the determination of Fluorides, Chloride and nitrate.

Batteries: definition, Classification**, Examples:** Ni–Cd cell, Lithium Ion batteries.

Surface Chemistry: Adsorption-Definition, types, Langmuir Adsorption theorem, applications of adsorption.

Fuel cells: hydrogen oxygen fuel cell and methanol-Oxygen fuel cell.

UNIT III :

Chemistry of Corrosion and its Control: Definition, Types of corrosion: Dry Corrosion, (Direct Chemical attack type of Corrosion), Wet Corrosion, Mechanisms, Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Pitting Corrosion.

Corrosion Control: Cathodic and Anodic Protection Methods, Electroplating-Principles and Mechanism, Electro plating of Chromium, Electro less plating of Copper and Nickel.

UNIT IV:

Polymers and Ceramics:

Polymers-Definitions of the terms involved, Types and mechanisms of Polymerization, Physical, mechanical and electrical properties of polymers. Preparation, properties and applications of Commercially important polymers Poly ethelene, PVC, Poly esters, Teflon, Bakelite and Nylon.

Natural Rubber – Processing of Natural Rubber and Vulcanization process.

Liquid Crystal polymers: Definition, Synthesis and applications of Kevlar, Electro Optic effect in Liquid Crystals, applications of Liquid Crystals.

Electro Ceramics: Introduction, Fabrication of ceramics, types of electro ceramics like conductors, dielectrics, and Insulators, non linear dielectrics, electro optic magnetic ceramics, properties and applications.

UNIT V:

Chemical Fuels & Lubricants: Introduction, Classification of chemical fuels Calorific value - High and Low calorific values, Determination of calorific value - solid or liquid fuel using Bomb calorimeter - numerical problems, Flue gas analysis by Orsat's analysis apparatus and Combustion Calculations.

Petroleum – Refining, Cracking, Knocking, Octane and Cetane numbers, synthesis of Unleaded petrol, Power alcohol and Biodiesel,

Lubricants: Definition, Lubrication mechanisms, Properties of Lubricants.

UNIT VI:

Modern Engineering materials :

Storage devices: materials used and working of Solid state drives, CD's ,pen drive

Photo &light responsive compounds: Sensors, biosensors-principle-few applications

Refractories: definition, classification with examples; criteria of a good refractory material; Properties, causes for the failure of a refractory material .

TEXT BOOKS:

1. Text book of Engineering Chemistry by Jain & Jain, Dhanpat Rai Publishing Company, 15th edition New Delhi (2008).
2. A text book of Engineering Chemistry by S.S. Dara, S.Chand & Co, New Delhi.
3. Text book of Engineering Chemistry by Sashi Chawla,Dhanpatrai Publishing Company ,New Delhi.
4. Chemistry for Engineers by Prof.K.N.Jayaveera, Dr.G.V.SubbaReddy, and Dr.C.Ramachandraiah, Tata McGraw Hill Higher Education, Hyd.2009.

REFERENCES:

1. Chemistry of Engineering Materials by C.V. Agarwal, Tara Publication, Varanasi.2008
2. Physical Chemistry - Glasston & Lewis.
3. Principles of Physical chemistry by B.R.Puri, L.R.Sharma and M.S.Pathania, S.Nagin, Chand and co.
4. Engineering Chemistry Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, Scitech Publications(India) Pvt. Limted, Hyderabad. 2009.

I B.Tech (ECE)

T	C
3+1*	4

(A0004121) MATHEMATICS – I

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

COURSE OBJECTIVES:

- To make aware students about the importance and symbiosis between mathematics and engineering. Achieve confidence with mathematical tools which an essential weapon in modern Graduate Engineer's Armory. Balance between the development of understanding and mastering of solution techniques with emphasis being on the development of student's ability to use Mathematics with understanding to solve engineering problems by retaining the philosophy learning by doing.

OUTCOMES:

- By the end of module students will be expected to demonstrate. The knowledge of Differential equations, Laplace Transformations, Real analysis, Curve tracing, Curvature, Multiple integrals and Vector calculus. By using the concept curve tracing we can draw the graph of any type of curves in Cartesian and Polar coordinates. The concept vector calculus has applications in fluid dynamics, heat flow in stars, study of satellites and Design of underwater transmission cables.

UNIT – I

Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications L-C-R circuits, Orthogonal trajectories.

UNIT – II

Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, Sin ax, cos ax, polynomials in x, e^{ax} V(x), xV(x), method of variation of parameters.

UNIT – III

Rolle's Theorem – Lagrange's Mean Value Theorem – (excluding proof). Simple examples of Taylor's and Maclaurin's Series - Functions of several variables – Jacobian – Maxima and Minima of functions of two variables, Lagrangian method of Multipliers with three variables only.

Raidus of Curvature – Curve tracing – Cartesian, polar and parametric curves.

UNIT – IV

Laplace transform of standard functions – Inverse transform – First shifting Theorem, Transforms of derivatives and integrals – Unit step function – Second shifting theorem – Dirac's delta function – Convolution theorem – Laplace transform of Periodic function.

UNIT – V

Differentiation and integration of Laplace transform – Application of Laplace transforms to ordinary differential equations of first and second order.

UNIT – VI

Multiple integral: – Double and triple integrals – Change of Variables – Change of order of integration.

Vector Calculus: Gradient – Divergence – Curl and Their properties; Vector integration – Line integral - Potential function – Area , Surface and volume integrals. Vector integral theorems: Green's theorem – Stoke's and Gauss's Divergence Theorem (excluding their proof). Verification of Green's – Stoke's and Gauss's Theorems.

TEXT BOOKS:

1. A Text Book of Engineering Mathematics, Vol – 1, T.K.V. Iyengar, B. Krishna Gandhi and Others S. Chand & Company.
2. A Text Book of Engineering Mathematics, C. Sankaraiah, V.G.S. Book Links.
3. A Text Book of Engineering Mathematics-1,E. Rukmangadachari, E. Keshava Reddy, Pearson Education.

REFERENCES:

1. A Text Book of Engineering Mathematics, B.V. Ramana, Tata Mc Graw Hill.
2. A Text Book of Engineering Mathematics, Thomson Book Collection.
3. A Text Book of Advanced Engineering Mathematics – A Computer Approach, N.Bail, M.Goyal& C. Watkins.
4. Engineering Mathematics, Sarveswara Rao Koneru, Universities Press

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I B.Tech (ECE) T C
3+1* 4

(A0005121) MATHEMATICAL METHODS

(Common to Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T)

COURSE OBJECTIVES:

- To make aware students about the importance and symbiosis between mathematics and engineering. Achieve confidence with mathematical tools which an essential weapon in modern Graduate Engineer's Armory. Balance between the development of understanding and mastering of solution techniques with emphasis being on the development of student's ability to use Mathematics with understanding to solve engineering problems by retaining the philosophy learning by doing.

OUTCOMES:

- By the end of module students will be expected to demonstrate The concept Matrices can be used to solve system of linear equations and also used in Spectral Expansion, Finite Element analysis etc. The concept numerical analysis is used in computing system and in all simulation research work. Fourier series and Fourier Transforms can be used to solve partial differential equations and they have lot of applications in circuit analysis. Z-Transforms are used to study the analysis of the waves in communication systems which deals discrete.

UNIT – I

Matrices: Elementary row transformations – Rank – Echelon form, normal form – Solution of Linear System of Homogenous and Non Homogeneous equations.
Eigen Values, Eigen vectors – Properties. Cayley – Hamilton Theorem – Inverse and powers of a matrix by Cayley–Hamilton theorem – Diagonolization of matrix.

UNIT – II

Real matrices – Symmetric, skew – Symmetric, orthogonal matrices.
Complex matrices: Hermitian, Skew-Hermitian and Unitary matrices – Eigen values and Eigen vectors and their properties. Quadratic forms – Linear Transformation – Reduction of quadratic form to canonical form and their nature(Signature and Index).

UNIT – III

Solution of Algebraic and Transcendental Equations: Introduction — The Method of False Position – Newton-Raphson Method.
Interpolation: Introduction – Finite differences – Forward Differences – backward Differences –Newton's forward and backward difference formulae for interpolation – Lagrange's Interpolation formula.

UNIT – IV

Curve fitting: Fitting a straight line – Second degree curve – Exponential curve-Power curve by method of least squares. Numerical Differentiation and Integration – Trapezoidal rule – Simpson's 1/3 Rule – Simpson's 3/8 Rule. Numerical solution of Ordinary Differential equations: Solution by Taylor's series-Picard's Method of successive Approximations-Euler's Method-Runge-Kutta Method.

UNIT – V

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

UNIT – VI

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Method of separation of variables – Solutions of one dimensional wave equation, heat equation and two-dimensional Laplace equation under initial and boundary conditions.
z-transform – Inverse z-transform – Properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equations by z-transforms.

TEXT BOOKS:

1. Mathematical Methods, T.K.V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. Mathematical Methods, C. Sankaraiah, V.G.S. Book Links.
3. Mathematical Methods, G. Shanker Rao, E. Keshava Reddy, I. K. International Publishing House Pvt. Ltd.

REFERENCES:

1. Numerical Methods for Scientific and Engineering Computation , M.K. Jain, S.R.K. Iyengar & R.K. Jain, New Age international Publishers.
2. Mathematical Methods – Pal – Oxford.
3. Introduction to Numerical Analysis – S.S. Sastry Printice Hall of India.
4. Mathematical Methods, S.K.V.S. Sri Ramachary, M. Bhujanga Rao, P.B. Bhaskar Rao & P.S. Subramanyam, BS Publications.

I B.Tech (ECE) T C
3+1* 5

(A0501121) FUNDAMENTALS OF COMPUTERS & C PROGRAMMING

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

OBJECTIVES:

- To make students aware about fundamentals of computer programming.
- To provide exposure on C programming language.
- To provide exposure on various C programming concepts like arrays, functions, pointers, structures, etc.
- To develop solutions for various problems by using C Programming Language by students.
- To provide exposure on various sorting and searching techniques

OUTCOMES:

By the end of this course, students should be able

- To understand about the various techniques for problem solving**.**
- To understand the fundamental concepts of C language like data types, keywords, operators, Input/Output functions and control statements.
- To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like arrays, functions, pointers and structures.
- To develop programs by performing I/O operations through Files.
- To implement various searching and sorting techniques.

UNIT I:

Overview of Computer Programming: Fundamentals of computers - Evolution of computer systems, Basic anatomy of computer system, Components of computer. Introduction to Computer Programming languages. Problem solving techniques - Algorithms and Flowcharts. How to trace an algorithm. Simple examples on how to write and trace an effective algorithms and how to draw an effective flow charts. Program control structures – sequence, selection and iteration. Software Development Method.

UNIT II:

Introduction to C Language: History of C language, Importance of C language, Definition of a C Program, General Form of a C Program, Steps to execute C program. Various Data Types supported by the C language. C tokens – Identifiers, Key words, Variables, Constants, Operators. Operator precedence and Associativity. Expressions and their evaluation process. Type Conversions- Automatic and type casting. Managing Input/Output operations. Control Statements- Non iterative statement- if, if else, Nested if else, lf else ladder and switch statements. Loop Constructs - while, for, do-while. break, continue, return and go to statements. Example Programs on the topics covered in this unit.

UNIT III:

Arrays and Functions:

Arrays – Definition, Need of arrays while writing C programs. Types of arrays- One dimensional, Two dimensional, Multi-dimensional arrays. Declaration of One dimensional array, initialization of one dimensional array, storing and accessing the elements from a one dimensional array. Two-dimensional Arrays and their declaration, initialization, storing & accessing elements from it. Declaration of multi-dimensional array, initialization of multi-dimensional arrays, storing and accessing the elements from a multi-dimensional array. . Example Programs on the topics mentioned above.

Functions: Introduction, Library Functions and User defined functions. Need for user-defined functions. General form of declaring a function, Elements of an user defined functions- Function definition Function call, Function declaration, Function name, return type, parameters, return statements. Categorization of functions with respect to parameters and return values. Definition of Scope of a variable with suitable examples. Storage Classes - Automatic, External, Static, and Register. Arrays and functions - Passing an entire array as an Argument to a function. Recursion – Need of recursive functions, Solving Towers of Hanoi Problem using recursive function and its trace out. Preprocessor Commands. Example Programs on the topics mentioned above.

UNIT IV:

Strings and Pointers:

Strings - Definition, Declaring and initializing strings, Basic Operations on strings, String handling Functions, Table of strings. Example Programs on the topics mentioned above.

Pointers - Introduction, Need of using pointer variables, Pointer variable declaration, initialization of pointer variables, how to access a value from a memory location through it's pointer variable. Arithmetic operations on pointer variables, Scale factor length. Pointers and functions - pointers as function arguments (i.e., call-by-

reference), Pointers and Arrays, Pointers and Strings, Array of Pointers, Pointers to Pointers, Generic Pointers, Pointer to Functions. Example Programs on the topics mentioned above.

UNIT V:

Structure and File Input/Output:

Structures – Introduction, Features of Structures. Declaration and Initialization of Structures, Accessing structure members, structure initialization. Nested Structures, Array of Structures, Arrays within structures and Pointers to Structures, Structures and Functions, Bit Fields, Unions, Union of Structures. Dynamic Memory Allocation Functions. Example Programs on the topics mentioned above.

File Input/Output: Introduction, Types of Files, File I/O Operations- High level I/O functions- Open & Close a file, Read and Write data into a file, Searching data in the file, Error handling during I/O operations on files. Command Line Arguments, Applications of Command Line Arguments. Example Programs on the topics covered in this unit.

UNIT VI:

Searchingand Sorting Techniques:

Searching Techniques- Linear search and Binary Search.

Sorting techniques- Bubble Sort, Selection Sort, Quick Sort, Insertion Sort, and Merge Sort.

Implementation of all the above mentioned techniques in C language and trace them by giving different test data.

TEXT BOOKS:

1. Computer programming and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill. 2009 revised edition.
2. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education
3. The C Programming Language, Brian W.Kerninghan, Dennis M.Ritchie.

REFERENCES:

1. Let us C – Yeshwanth kanetkar, 8th Edition.BPB Publications
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press
3. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.
5. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.

I B.Tech (ECE) D 6 C 4

(A0301121) ENGINEERING DRAWING

(Common to all Branches)
For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

COURSE OBJECTIVES

At the end of this course the student should able to:

- Apply engineering graphics as a communications tool.
- Able to describe the skills required to develop engineering working drawings, sketch three-dimensional objects.
- Able to create orthographic projections.
- Able to create auxiliary views, to create sectional views.
- Able to dimension properly and also develop skill in using free hand sketches.
- The student should able to apply the knowledge of Engineering drawing for Architectural and engineering designs, Mechanical and Automobile engineering designs, design of communication equipment etc.

COURSE OUTCOMES:

- Draw different engineering curves and know their applications.
- Draw orthographic projections of different objects.
- Visualize three dimensional objects and draw isometric projections.
- Use in techniques and able to interpret the drawing in engineering field.

UNIT – I

INTRODUCTION TO ENGINEERING DRAWING: Principles of Engineering Graphics and their Significance – Drawing Instruments and their Use – Conventions in Drawing – Lettering – BIS Conventions of Engineering materials (Ferrous, Non ferrous metals, wood, plastic, glass and rubber).

Curves used in Engineering Practice:

a) Conic Sections including the Rectangular Hyperbola.
b) Cycloid, Epicycloid and Hypocycloid.
c) Involutes.
d) Helices.

UNIT – II

PROJECTION OF POINTS AND LINES: Principles of Orthographic Projection – Conventions –Projections of Points, Lines, Line inclined to one and both planes, Problems on projections (First Angle Projections only).

UNIT – III

PROJECTIONS OF PLANES & SOLIDS: Projections of regular Plane surfaces Viz., Triangle, Rectangle, square, pentagon and hexagon in simple position - inclined to one plane and inclined to both the planes (First Angle Projections only).
Projections of Regular Solids inclined to one and both planes (First Angle Projections only).

UNIT – IV

SECTIONS OF SOLIDS: Section Planes and Sectional views of Right Regular Solids – Prism, Pyramid, Cylinder and Cone – True shapes of sections.

UNIT – V

DEVELOPMENT OF SURFACES: Development of surfaces of right regular solids – Prisms, pyramids, cylinder, cone and their sectional parts. Parallel line and Radial line methods.

UNIT – VI

ISOMETRIC AND ORTHOGRAPHIC VIEWS: Types of Pictorial projections - Isometric View and Isometric projections of simple solids -solid objects (combination of two solids) – Conversion of Isometric Views to orthographic Views - Conversion of orthographic views to isometric views.

TEXT BOOKS:

1. Engineering Drawing, N.D. Bhat / Charotar, Charotar Publishers.
2. Engineering Drawing & Graphics, Venu Gopal, New Age Publications.
3. Engineering Drawing, K.L. Narayana, P. Khanniah, Scitech Publications.

REFERENCES:

1. Engineering Drawing, B.V.R. Guptha, J.K. Publishesrs.
2. Engineering Drawing, Shah and Rana, 2/e Pearson Education.
3. Engineering Drawing, Venkata Reddy, B.S.Publishers.

I B.Tech (ECE) P 3 C 3

(A0591121) COMPUTER PROGRAMMING LAB

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

RECOMMENDED SYSTEMS /SOFTWARE REQUREMENTS:

Intel based desktop PC with ANSI C Compiler and Supporting Editors

COURSE OBJECTIVES:

1. To make the student to learn how to write programs in **C** language.
2. To introduce different constructs of **C** language to the students to solve various kinds of problems.
3. To make the students to implement different kinds of sorting algorithms like selection sort, bubble sort, insertion sort, quick sort and merge sort etc.
4. To make the students to implement different kinds of searching algorithms like linear search and binary search etc.

OUTCOMES:

By the end of this course, students should be able

1. To understand about the fundamentals of Computer programming**.**
2. To understand the fundamental concepts of C language like data types, keywords, operators, Input/Output functions and control statements.
3. To understand how to develop C programs to solve various kinds of problems by using different C programming concepts like arrays, functions, pointers and structures.
4. To develop programs by performing I/O operations through Files.
5. To implement various searching and sorting techniques.

Exercise l:

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

b) 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!

Exercise 2:

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

b) The total distance travelled by vehicle in‘**t’** seconds is given by distance $S = ut+1/2at^2$ where ‘**u**’ and ‘**a**’ are the initial velocity (m/sec.) and acceleration (m/sec^2) respectively. Write C program to find the distance travelled at regular intervals of time given the values of **‘u**’ and ‘**a**’. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of **‘u’** and ‘**a**’.

Exercise 3:

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

b) Write a C program to generate the first ‘n’ terms of the Fibonacci sequence.
Note: 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.

c) Write a C program to generate all the prime numbers between 1 and n, where ‘n’ value is given by the user.
Note: Develop each of the above programs by using different loop constructs supported by C language. (i.e., while, do while and for Loops).

Exercise 4:

a) Write a C Program to mask the most significant digit of the given number.

b) Given an integer number, write a C program, that displays the number as follows:

First line: all digits
Second line : all except first digit
Third line : all except first two digits
------ ---- ----------
Last line : last digit

For ex:
1234
234
34
4

Exercise 5:

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

Exercise 6:

a) Write a C program to find all the even numbers in the given one dimensional array.
b) Write a C program to print the elements of an array in reverse order.
c) Write a C program to perform the following operations:
   i) Addition of Two Matrices ii) Multiplication of Two Matrices

[Note: Use functions to implement the above specified operations]

Exercise 7:

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

Exercise 8:

a) Write a C Program to solve the Towers of Hanoi problem by using recursive function.
b) Writea C Program to demonstrate the various storage classes, which are supported by the C language. [i.e., automatic, external, static and register]

Exercise 9:

a) Write a C Program to demonstrate that, how to pass an entire array as an argument to a function with a suitable example.
b) Write a C Program to perform various operations on given two strings using string handling functions.

Exercise 10:

a) Write a C Program to perform various arithmetic operations on pointer variables.
b) Write a C Program to demonstrate the following parameter passing mechanisms:
   i) call-by-value ii) call-by-reference

Exercise 11:

a) Write a C program that uses functions to perform the following operations:
   i) To insert a sub-string in to a given main string from the specified 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.

Exercise 12:

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.

Exercise 13:

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 the given Roman numeral to its decimal equivalent value.

Exercise 14:

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 the complex number using a structure.)

Exercise 15:

a) Write a C program which copies contents of one file to another file.
b) Write a C program to reverse the first 'n' characters in a file.

(Note: The **file name** and **n** are specified on the command line.)

Exercise 16:

a) Write a C program to display the contents of a file using command line arguments.
b) Write a C program to merge two files into a third file (i.e., the contents of the first file followed by the contents of the second file are put in the third file)

(Note: The **file name** and **n** are specified on the command line.)

Exercise 17:

Write a C program that implements the following sorting methods to sort a given list of integers in ascending order.

i) Bubble sort ii) Selection sort iii) Insertion sort

Exercise 18:

Write C program that implements the Quick sort method to sort a given list of integers in ascending order.

Exercise 19:

Write C program that implement the Merge sort method to sort a given list of integers in ascending order.

Exercise 20:

Write C program to implement linear search method to search an element in a given list of integers. [**Note:** Use both recursive and non recursive functions]

Exercise 21:

Write C program to implement Binary search method to search an element in a given list of integers. [**Note:** Use both recursive and non recursive functions]

REFERENCE BOOKS

1. The Spirit of C, an introduction to modern programming, M.Cooper, Jaico Publishing House.
2. Mastering C, K.R. Venugopal and S.R. Prasad, TMH Publications.
3. Computer Basics and C Programming, V. Raja Raman, PHI Publications.

I B.Tech (ECE) P 3 C 3

(A0391121) ENGINEERING AND IT WORKSHOP

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

OBJECTIVES:

The budding Engineer may turn out to be a technologist, scientist, entrepreneur, practitioner, consultant etc. There is a need to equip the engineer with the knowledge of common and newer engineering materials as well as shop practices to fabricate, manufacture or work with materials. Essentially he should know the labor involved, machinery or equipment necessary, time required to fabricate and also should be able to estimate the cost of the product or job work. Hence engineering work shop practice is included to introduce some common shop practices and on hand experience to appreciate the use of skill, tools, equipment and general practices to all the engineering students.

OUTCOMES:

At the end of the Engineering Work Shop: A Student involved in acquiring manufacturing skills must have balanced knowledge of theory as well as practice. The First students of all engineering branches should know the basic knowledge of various tools and their use in different sections of manufacturing such as fitting, carpentry, smithy, tin smithy, foundry, welding etc. and basic engineering practices such as plumbing, electrical wiring, electronic circuits, machine shop practice.

1. TRADES FOR EXERCISES:

a) **Carpentry shop** – Two joints (exercises) involving tenon and mortising, groove and tongue: Making middle lap T joint, cross lap joint, mortise and tenon T joint, Bridle T joint from out of 300 x 40 x 25 mm soft wood stock.

b) **Fitting Shop**– Two joints (exercises) from: square joint, V joint, half round joint or dove tail joint out of 100 x 50 x 5 mm M.S. stock.

c) **Sheet Metal Shop**– Two jobs (exercises) from: Tray, cylinder, hopper or funnel from out of 22 or 20 gauge G.I. sheet.

d) **House Wiring** – Two jobs (exercises) from: wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for two lamps controlled by one switch in series.

e) **Welding** – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint.

f) **Soldering–** Test procedure for soldering & Series and parallel connection.

g) **Black smithy –** Two Jobs (exercises)To make square cross section bar from a given round bar & To make an eye bolt from a given square bar.

2. TRADES FOR DEMONSTRATION:

a) Plumbing

b) Machine Shop

c) Metal Cutting

REFERENCE BOOKS:

1. Engineering Work shop practice for JNTU, V. Ramesh Babu, VRB Publishers Pvt. Ltd., 2009.
2. Work shop Manual / P.Kannaiah/ K.L.Narayana/ SciTech Publishers.
3. Engineering Practices Lab Manual, Jeyapoovan, Saravana Pandian, 4/e Vikas.
4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

IT WORKSHOP

OBJECTIVES:

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

OUTCOMES:

At the end of the course, students should be able

- To work with few of the Microsoft office tools like word, excel etc.
- Should identify the fundamental ports of the computer.
- Should be able to Assemble and dissemble the computer (Desktop system).
- Gain knowledge about Web browsers, search engines & about basic network settings.

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

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace for usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX. (**It is recommended to use Microsoft office 2007in place of MS Office 2003)**

PC Hardware

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

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

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

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

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

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

OFFICE TOOLS

LaTeX and Word

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

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

Excel

Exercise 8 - Excel Orientation: The mentor needs to tell the importance of MS office 2007/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel – Accessing, overview of toolbars, saving excel files, Using help and resources.

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

LaTeX and MS/equivalent (FOSS) tool Power Point

Exercise 9 - Task1: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this Exercise includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

Exercise 10 - Task 2: Second Exercise helps students in making their presentations interactive. Topic covered during this Exercise includes: Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

Internet & World Wide Web **2 Exercises**

Exercise 11 - Task 1: **Orientation & Connectivity Boot Camp:** Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate, to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Exercise 12 - Task 2: **Search Engines & Netiquette:** Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated by the student to the satisfaction of instructors.

Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer.

REFERENCES:

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

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I B.Tech (ECE) P C
3 3

(A0091121) ENGINEERING PHYSICS & ENGINEERING CHEMISTRY LAB

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E.

OBJECTIVES:

1. Providing an opportunity to develop and hone experimental skills, particularly as they pertain to scientific and technical knowledge
2. Providing a solid grounding in the methods of scientific and research inquiry,
3. Apply the scientific method to experiments in the laboratory.
4. To create curiosity in research methods by the experiments Hall effect, four pobe conductivity, laser diffraction etc.

OUTCOMES:

1. Develop procedures and observational skills as data is taken and gain a fundamental understanding of simple and complex apparatus used in the experiment.
2. Apply analytical techniques, statistical analysis, graphical analysis, spread sheet data/recording to the experiments.
3. Verify the theoretical ideas and concepts covered in lecture by completing a host of experiments.
4. Take the time to discuss the procedure, the data, and the results of the experiment with the lab partner.

Any TEN of the following experiments are to be performed during the Academic year.

1. Determination of wavelength of given source – spectrometer – normal incidence method.
2. Dispersive power of the prism – Spectrometer.
3. Determination of wavelength of a laser source - Diffraction Grating.
4. Determination of particle size by using a laser source.
5. Determination of thickness of a thin wire using parallel fringes.
6. Newton's Rings.
7. Magnetic field along the axis of a current carrying coil – Stewart and Gee's method.
8. Numerical aperture of an optical fiber.
9. Hall Effect.
10. B – H Curve.
11. Energy gap of a Semiconducting Material
12. Determination of rigidity modulus of a wire material – Torsional pendulum
13. Determination of dielectric constant.
14. Verification of laws of stretched string – Sonometer.
15. Study of bending loss in optical fiber

Equipment required:

Spectrometer, Grating, Prism, Mercury vapour lamp, Sodium vapour lamp, Travelling Microscope, Wedge arrangement, Newton rings setup, Stewart-Gee's apparatus, He-Ne laser source, Optical fiber, Hall effect kit, B-H loop kit, Energy gap kit (four probe method), Torsional pendulum, Dielectric constant kit, Sonometer, Melde's apparatus.

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ENGINEERING CHEMISTRY LAB

OBJECTIVES:

Chemistry is one subject which gives adequate knowledge about the applications involved in the aerospace, mechanical, environmental and other engineering fields. Knowledge of chemistry plays a vital role in engineering profession enabling the potential engineers to understand and to perform successfully while working on multidisciplinary tasks.

The main objective of the department is to develop the necessary theoretical and practical aspects required for understanding intricacies of the subject and also give adequate exposure to the applied chemistry aspects in different disciplines of engineering. To educate the engineering students with all necessary concepts and to develop a scientific attitude by means of distinguishing, analyzing and solving various engineering problems. It develops their experimental skills and important practical knowledge in engineering by providing necessary facilities in chemistry laboratory.

Experiments:

1) Preparation of Standard Potassium Dichromate and Estimation of Ferrous Iron.
2) Preparation of Standard EDTA solution and Estimation of Hardness of Water.
3) Preparation of Standard EDTA and Estimation of Copper.
4) Verification of Beer-Lambert's Law.
5) Determination of strength of the given Hydrochloric acid against standard sodium hydroxide solution by Conducto metric titration.
6) Determination of strength of the given Acetic acid against standard sodium hydroxide solution by Conducto metric titration.
7) Determination of viscosity of the oils through Redwood viscometer.
8) Determination of calorific value of fuel using Bomb calorimeter.
9) Estimation of dissolved oxygen.
10) Preparation of Phenol-formaldehyde Resin.
11) Preparation of Ester.

BOOKS:

1) Chemistry-lab manual by Dr K.N.Jayaveera and K.B. Chandra Sekhar, S.M. Enterprizes Ltd.
2) Vogel's Book of Quantitative Inorganic Analysis, ELBS Edition.

Equipment Required:

Glass ware: Pipettes, Burettes, Volumetric Flasks, Beakers, Standard flasks, Measuring jars, Boiling Test tubes, reagent bottles, (Borosil)

1) Analytical balance (keroy) (15 Nos)
2) Calorimeter
3) Bomb Calorimeter
4) Redwood viscometer No.1& No.2
5) Conductometer/ Conductivity bridge
6) Wash bottles, test tube stands, burette stands
7) Gas cylinders with Bunsen burners
8) Chemicals: Hydrochloric acid, sodiumhydroxide, EDTA, EBT indicator, fast sulfon black-f, urea, benzoic acid, methanol, Mohr's salt, copper sulphate, magnesium sulphate, ammonia, ammonium sulphate, calcium sulphate etc.,

I B.Tech (ECE) P C
3 3

(A0092121) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

(Common to all Branches)

For Branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E

OBJECTIVES:

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

- To train students to use language effectively in everyday conversations, to participate in group discussions, to help them face interviews, and sharpen public speaking skills
- To expose the students to a varied blend of self-instructional, learner-friendly modes of language learning
- To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm
- To initiate them into greater use of the computer in writing, format-making etc.
- To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required ability to face computer-based competitive exams such GRE, TOEFL, GMAT etc.

OUTCOMES:

- Be able to improve social interactive skills.
- Be able to acquire standard pronunciation.
- Be able to develop language skills – LSRW Skills.
- Be able to enhance communication skills.

Syllabus

Part 1 – **Language Development** through Four Skills from Multimedia

Part II - Phonetics & Pronunciation Strategies: Vowels, Diphthongs, Consonants, Word Accent and Intonation

Part III – a. **Communication & Social Interactive Skills**:

- Ice Breaking Activities
- JAM
- Describing Objects
- Situational Dialogues & Role-Play (Group Task)
- Story Narration (Group Task)
- Information Transfer
- Debate (Group Task)

b. Writing Tasks

- Personal Experiences
- Current Affairs
- Technology Trends
- Book Reviews

c. Project / Creative Task (Team Task)

Evaluation:

English Language Laboratory Practical Paper:

- The Practical Examinations for the English Language Laboratory shall be conducted as per the norms prescribed for the core engineering practical sessions.
- For the language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 marks for External Examination. Of the 25 marks, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting internal lab test(s). The year-end examination shall be conducted by the teacher and External Examiner from other Institution.

Software Prescribed:

- Alania Series for Four Skills
- Cambridge Advanced Learners' English Dictionary with CD (Accent)
- The Rosetta Stone English Library (Four Skills)
- EL-Client (Phonetics)
- CL-Client (Communication skills)
- Department Built-In Software/Data

Suggested Reading:

- Longman Dictionary of Contemporary English for Advanced Learners, Pearson
- Education Ltd.
- Better English Pronunciation (Second Edition) by D. O' Connor,Cambridge University Press 1967, 1980
- Communication Skills for Engineers(Second Edition) by C. Muralikrishna & Sunita Mishra Pearson Education Ltd, 2011
- Better English pronunciation by Thakur K B P Sinha , Vijay Nicole, 2005
- Practical English Usage (New Edition) by Michael Swan, Oxford University Press.

II B.Tech, I-Sem (ECE)

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(A0008123) MATHEMATICS – III

(Common to ECE, EEE & EIE)

OBJECTIVES:

- Beta And Gamma functions are used to solve some special integrals that are not able to by using general methods.
- The use of the concept complex analysis is to find the solution of the equations which does not have solution in real plane.
- The concept of complex analysis is widely used in space study, aero system, potential functions, fluid mechanics etc.

OUTCOMES:

- Students will able to use Beta and Gamma functions to solve some special integrals that are not able to by using general methods.
- Students will able to use of the concept complex analysis is to find the solution of the equations which does not have solution in real plane.
- Students will able to use the concept of complex analysis is widely used in space study, aero system, potential functions, fluid mechanics etc.

UNIT - I

Functions of complex variable – Continuity – Differentiability – Analyticity Properties – Cauchy - Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions – Milne -Thompson method.

Elementary functions: Exponential, trigonometric, hyperbolic functions and their properties - General power Z^c (c is complex), principal value.

UNIT-II

Complex integration: Line integral-evaluation along a path by indefinite integration-Cauchy's integral theorem-Cauchy's integral formula-Generalized integral formula.

UNIT-III

Complex power series: 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.

UNIT-IV

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)$\int_0^{2\pi} f(cos\theta, sin\theta)d\theta$

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

UNIT-V

Argument principle –Rouche's Theorem – determination of number of zeros of complex polynomials-Maximum Modulus principle-Fundamental theorem of Algebra, Liouville's Theorem.

UNIT-VI

Conformal mapping: Transformation by e^z, ln z ,z^2,z^n (n positive integer)sin z,cosz, z + a/z, Translation, rotation, inversion and bilinear transformation – fixed -points- cross ratio- properties- invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given point

TEXT BOOKS:

1) A Text book of Engineering Mathematics, Vol – III by T.K.V. Iyengar, B. Krishna Gandhi and others, S. Chand and company.
2) Higher Engineering Mathematics by B.S.Grewal, Khanna Publishers.
3) Engineering Mathematics- III by E. Rukmangadachari, E. Keshava Reddy, Pearson education.

REFERENCES:

1) Advanced Engineering Mathematics by Erwin Kreyszig - Wiley Publications.
2) Engineering Mathematics – III A by Dr.M.K. Venkat araman – The National Publishing co.
3) A text book of Engineering Mathematics by N.P.Bali, Iyengar – Lakshmi Publications (Pvt ltd).

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

II B.Tech, I-Sem (ECE) T C
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(A0010123) ENVIRONMENTAL STUDIES

(Common to all branches: E.C.E, E.E.E, E.I.E, C.S.E, I.T, M.E, C.E**)**

OBJECTIVES :

- To create awareness about environment among the students.
- To develop an understanding of ecosystem and their interrelations.
- To develop an awareness about the utilization, over exploitation of natural resources.
- To recognize the need for keeping pollution under control in order to maintain the quality of life.
- To acquire skills to analyze and interpret information relating to environmental problems.
- To develop the ability to identify, analyze and reflect upon different environmental Concerns.
- To develop skills for effectively tackling problems related to the local environment.
- To adopt practices that help in promoting balance in nature by making judicious utilization of resources and materials.
- To develop love, affection, sensitivity and sense of responsibility towards all living beings.
- To appreciate and respect legal provisions for protection of animals and plants.
- To imbibe the essence of environmental values and ethics in order to live in harmony with nature.

UNIT I

MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES: Environment -Definition, scope and importance, Segments of Environment-Importance, Productivity, Aesthetical & Optional values of nature, need for public awareness.

UNIT II

HARNESSING RESOURCES

a) Sources of Energy:- Renewable and non-renewable resources.
b) Natural Resources: soil, water sources-Hydro power project-problems, forest, minerals -Utilization-problems.
c) Solar Energy and its applications - Photo Voltaic Cells, Solar water heating, solar pond, Solar Cooker. Non-conventional sources of energy.
d) Chemical fertilizers and pesticides-problems. Green Revolution-white revolution- blue revolution.
e) Depletion of Resources-Over utilization and consumption, non –equitable distribution of resources, Technological and Industrial developmental activities.

UNIT III

CONCEPTS OF ECO-SYSTEM : Structure of ecosystem: Tropic structure, producers, consumers, and decomposers; Interaction between biotic and a biotic factors in an ecosystem; Energy flow and its importance; Trophic levels, food chain, Food web, Food Pyramid;

TYPES OF ECOSYSTEM: Understanding the types of ecosystem

i Terrestrial (forest, grassland and desert) and
ii Aquatic (fresh water - River, pond and salt water-Marine) with an example of each.

UNIT IV

ENVIRONMENTAL FACTORS

a) Disasters:- Natural and man-made Nuclear Disasters, major types and their causes, impact on environment and human life and remedies.
b) Impact of environment degradation on: - Natural habitats, living forms (endangered and Extinct species).
c) Pollution:- Definition, types (soil, water, air and noise), sources , impact on physical environment control and preventive measures of pollution.

UNIT V

ENVIRONMENTAL VALUES:

a) Population and Environment:- Definition of species, community, population; Population growth rate curves, Sex ratio, From unsustainable to sustainable development, Diseases-HIV, Malaria, Diaharia, Cancer.
b) Human rights, fundamental duties and value education.
c) Women and child welfare & Family welfare programs.

UNIT VI

ISSUES OF THE ENVIRONMENT

a) Resettlement and rehabilitation of people.
b) Energy Crisis – urban and rural sectors.
c) Climatic changes Greenhouse effect and global warming..
d) Acid rain& Ozone layer depletion.
e) Wild-life management - National parks, sanctuaries and bio-reserves, poaching, hunting and bio-piracy.
f) E Waste Management

REFERENCES:

1. Environmental Studies by ERACH BHARUCHA for UG courses by UGC.
2. Environmental Science by Anubha Koushik & C.P Koushik, New Age International Publishers.
3. Environmental Engineering & Management by Dr.Suresh K.Dhameja, Katson books.
4. Environmental Studies by Rajagopalan, Oxford University press.
5. Environmental Studies by Manoj Tiwari &Archana Tiwari , J.K.International Publishers.
6. Environmental Studies by Benny joseph.
7. Environmental Science & Technology by M.Anji Reddy ,BS Publications.

II B.Tech I-Sem (ECE)

T	C
3+1*	3

(A0401123) ELECTRONIC DEVICES AND CIRCUITS

(Common to ECE, EEE & EIE)

OBJECTIVES:

- To understand the basic materials used for fabrication of different semiconductor devices.
- To understand construction details, principle of operation and equivalent electrical model of each device.
- Evolution of different diodes based on doping levels.

OUTCOMES:

- Students are capable of identifying a particular device for different applications.
- Students are able to understand that all the devices are basically two state devices (Switches).
- Students are capable of using two junction device as an amplifying device.

UNIT- I

ELECTRONICS DYNAMICS AND CRO: Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection).Application of CRO, Voltage, Current and Frequency Measurements.

UNIT- II

SEMICONDUCTOR DIODE CHARACTERISTICS: Review of PN Junction Diode. V-I characteristics of PN diode, Static and Dynamic resistances, Temperature dependence of parameters(Derivation not necessary)Diode equivalent circuits, Diode capacitances, Breakdown Mechanisms in Semiconductor Diodes, Zener diode characteristics, Principle of operation and Characteristics of Tunnel Diode with the help of energy band diagrams, Schottky Barrier Diode, Thermistor, avalanche photo diode, small signal equivalent circuit of PN diode, Specifications of PN diode, tunnel diode, zener diode, Thermistor and avalanche photo diode.

UNIT- III

RECTIFIERS, FILTERS AND REGULATORS: PN junction as a Rectifier, Half wave rectifier, ripple factor, Efficiency, regulation and Transformer utilization factor (TUF). Full wave rectifier, Bridge rectifier. **Filters:** Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L-Section filter, Π- Section filter, comparison of various filter circuits, Simple circuit of a regulator using Zener diode.

UNIT-IV

BIPOLAR JUNCTION TRANSISTORS (BJT): Study of operation of BJT, Detailed study of currents in a transistor, Input and Output characteristics of transistor in CB, CE, and CC configurations, Relation between Alpha, Beta and Gamma. Principle of operation and characteristics of SCR. small signal equivalent circuit of BJT, Specifications of BJT and SCR.

UNIT- V

TRANSISTOR BIASING AND STABILISATION: Importance of Biasing, Operating point, Load line(DC and AC) Types of Biasing: Fixed bias, Collector to Base, Voltage Divider bias, Bias stability, Stabilization factors, (S, S', S''), Compensation techniques, (Compensation against variation in V_{BE}, I_{co},) Thermal run away, Thermal stability in CE configuration, Transistor as an amplifying device.

UNIT-VI

JUNCTION FIELD EFFECT TRANSISTORS (JFET): Construction, operation and transfer and output characteristics, Pinch-Off voltage, Small signal equivalent model of JFET, construction of MOSFET and its characteristics (Enhancement and depletion mode), Comparison of Transistors (BJT, FET, and MOSFET). Principle of operation and characteristics of UJT. Specifications of JFET, MOSFET and UJT.

TEXT BOOKS :

1. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9th Edition, 2006.
3. Electronic Devices and Circuits- David A. Bell, Oxford University Press, 5th Edition, 2008.

REFERENCES :

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6th edition, 2004.
2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn.., 1998.
3. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988.
4. Electronic Devices and Circuits – Dr. K. Lal Kishore, B.S. Publications, 2nd Edition, 2005.
5. Electronic Devices and Circuits- Prof GS N Raju I K International Publishing House Pvt. Ltd 2006.

II B.Tech I-Sem (ECE) T C
3+1* 3

(A0402123) SIGNALS AND SYSTEMS

(Common to ECE & EIE)

OBJECTIVES:

- Study of signals and systems.
- Analysis of signals & systems and frequency transform methods.
- To understand the concepts of convolution and correlation.

OUTCOMES:

- For integro differential equations, the students will have the knowledge to make use of Laplace transforms.
- For continuous time signals the students will make use of Fourier transform and Fourier series.
- For discrete time signals the students will make use of Z transforms.
- The concept of convolution is useful for analysis in the areas of linear systems and communication theory.

UNIT-I

INTRODUCTION TO SIGNALS: Definition of signals, classification of signals and systems, 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.

UNIT-II

REPRESENTATION OF SIGNALS USING FOURIER SERIES AND FOURIER TRANSFORMS: 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, Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and unit step function.

UNIT-III

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, Impulse 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, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and physical realization-The poly-wiener criterion, Relationship between bandwidth and rise time.

UNIT-IV

CONVOLUTION AND CORRELATION OF SIGNALS: Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution properties of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Properties of convolution, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT-V

LAPLACE TRANSFORMS: Review of Laplace transforms, 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's relation between L.T. and F.T. of a signal.

UNIT-VI

SAMPLING THEOREM AND Z-TRANSFORM: Representation of continuous time signals by its sample - Sampling theorem – Reconstruction of a Signal from its samples, aliasing – discrete time processing of continuous time signals, sampling of discrete time signals. Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, 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, BS Publications, 2003.
2. Signals and Systems - A V Oppenheim A S Willsky With S Hamid Nawab, Publisher: Prentice Hall;2nd Edition, 2011.

REFERENCES:

1. Signals & Systems - Simon Haykin, Barry Van Veen, Signals and Systems, 2nd edition, JohnWiley& Sons, 2003.
2. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
3. Fundamentals of Signals and Systems Michel J. Robert, MGH International Edition, 2008.
4. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, Pearson education.3rd Edition, 2004.

II B.Tech I-Sem (ECE) T 3+1* C 3

(A0205123) NETWORK ANALYSIS

(Common to ECE & EIE)

OBJECTIVE:

- This course introduces the basic concepts of circuit which is the foundation for all subjects related to Electrical & Electronics Engineering discipline. The emphasis of this course is laid on the basic analysis of circuits which includes Single phase circuits, Theorems, Steady state & Transient analysis and Network topology.

UNIT – I

Basic Electrical Components-Sources: Circuit Concept – R-L-C components – Voltage and Current sources – specifications of components, sources- Independent and dependent sources-Source transformation – Voltage – Current relationship for passive elements – Kirchhoff's laws – network reduction techniques – series, parallel, series parallel, star-to-delta or delta-to-star transformation-Introduction to magnetically coupled circuits.

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 – series, parallel circuits, concept of band width and Q factor.

UNIT – III

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

UNIT – IV

Network theorems (without proofs): Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for d.c. and a.c. excitations

UNIT – V

Transient Analysis: Transient response of R-L, R-C, R-L-C circuits (Series combinations only) for d.c. and sinusoidal excitations only – Initial conditions - Solution using differential equation approach and Laplace transform methods of solutions.

UNIT – VI

Network Parameters: Two port network parameters – Z, Y, ABCD and hybrid parameters and their relations– – concept of transformed network – 2-port network parameters using transformed variables.

TEXTBOOKS:

1. Engineering Circuit Analysis by W.H. Hayt, Jr., J.E. Kemmerly, and S.M. Durbin, Tata McGraw hill, 6th Edition 2002.
2. Network Analysis byM.E Van Valkenberg, Prentice Hall (India), 3rd edition, 2011.
3. Circuit Theory (Analysis & Synthesis) – A.Chakrabarthi, Dhanpat Rai & Co,2000.

REFERENCES:

1. Electric Circuits - J. Edminister & M. Nahvi, - Schaum's Outlines, Tata Mc Graw-Hill Publishing Company Ltd., 1999.
2. Network Theory – Sudhakar and Shymmohan, TMH Publications.

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II B.Tech, I-Sem (ECE) T 3+1* C 3

(A0011123) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

(Common to all Branches)

OBJECTIVES

- To understand the principles of and techniques of managerial economics.
- To understand the business organizations.
- To understand the financial accounting and analysis.
- To understand maintain a particular product at the lowest cost while meeting the specifications of the customer

OUTCOMES:

- Students will able to analyse the demand in the present market.
- Students will able to how to precise the production cost.
- Students will able to know the price output decisions are made in markets.
- Students will able to maintain the books by using the financial accounting

UNIT I

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

UNIT II

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

UNIT III

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

UNIT IV

Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.

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

UNIT V

Introduction to Financial Accounting: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts (Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments).

UNIT VI

Financial Analysis through ratios: Computation, Analysis and Interpretation of Liquidity Ratios (Current Ratio and quick ratio), Activity Ratios (Inventory turnover ratio and Debtor Turnover ratio), Capital structure Ratios (Debt- Equity ratio, Interest Coverage ratio), and Profitability ratios (Gross Profit Ratio, Net Profit ratio, Operating Ratio, P/E Ratio and EPS).

TEXT BOOKS:

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

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.

5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.
6. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson.
7. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI.
8. Raghunatha Reddy & Narasimhachary: Managerial Economics& Financial Analysis, Scitech.
9. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas.
10. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley. Dwivedi: Managerial Economics, 6th Ed., Vikas**.**

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

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

II B.Tech I-Sem (ECE) T C
3 2

(A0007123) APTITUDE ARITHMETIC REASONING AND COMPREHENSION

(Common to All Branches)

(Skill Development Course)

OBJECTIVES:

- To make the students ready to the recruitment drives.
- To raise the confidence of the students to face the written test of any Company.
- To train the students regarding employability skills.

OUTCOMES:

- Students becomes well trained for recruitment drives.
- Student become well trained to face the written test of any company.
- Students become well trained in employability skills

UNIT I

Numbers, Number Systems Simple Equations, Ratio, Proportion, Variation Quadratic Equations, Progressions Percentages.

UNIT II

Profit, Loss, Partnerships Averages, Mixtures & Allegations, Simple Interest, Compound Interest, Time and Work-Pipes, indices, surds, inequalities ,Cisterns Time and Distance Geometry and Menstruation.

UNIT III

Permutations & Combinations and Probability Data Interpretation & Data Sufficiency.

UNIT IV

Number & Letter Series, Analogies, Coding Decoding, Odd Man Out Blood Relations.

UNIT V

Direction Sense, Symbols and Notations Deductions & Connectives Clocks, Calendars Analytical

UNIT VI

Reasoning (Distribution+ Binary Logic + Puzzles) Cubes, Venn Diagrams Analytical Puzzles (Linear + Circular +Selections + Sequencing + Routes & Networks + Comparisons) and Non Verbal Reasoning

REFERENCES:

1. R.S.Agarwal " Quantitative Techniques" S.Chand Series
2. Shankuntala Devi " Techniques of Reasoning" S.Chand Series

II B.Tech, I-Sem (ECE) P 3 C 2

(A0491123) ELECTRONIC DEVICES AND CIRCUITS LAB

(Common to ECE, EEE & EIE)

OBJECTIVES:

- This Lab provides the students to get an electrical model for various semiconductor devices. Students can find and plot V_I characteristics of all semiconductor devices. Student learns the practical applications of the devices. They can learn and implement the concept of the feedback and frequency response of the small signal amplifier

OUTCOMES:

- Students able to learn electrical model for various semiconductor devices and learns the practical applications of the semiconductor devices

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.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Low power JFETs, MOSFETs, Power Transistors, LEDs, LCDs, SCR, UJT. Study and operation of
    - Multi-meters (Analog and Digital)
    - Function Generator
    - Regulated Power Supplies.
3. Study and Operation of CRO.

(For Laboratory examination – Minimum of 8 experiments)

1. Generating the Lissajious patterns and finding unknown frequency.
2. PN Junction diode characteristics.
3. Zener diode characteristics and Zener as a Regulator.
4. Transistor CB characteristics (Input and Output).
5. Transistor CE characteristics (Input and Output).
6. Rectifier without filters (Full wave &Half wave).
7. Rectifier with filters (Full wave &Half wave).
8. FET characteristics.
9. MOSFET characteristics.
10. SCR characteristics.
11. UJT characteristics.
12. Series and shunt regulators using transistors.

Equipment required for Laboratories:

1.	Regulated Power supplies (RPS)	- 0-30v
2.	CROs	- 0-20M Hz.
3.	Function Generators	- 0-1 M Hz.
4.	Multimeters	
5.	Decade Resistance Boxes/Rheostats	
6.	Decade Capacitance Boxes	
7.	Micro Ammeters (Analog or Digital)	- 0-20 µA, 0-50µA, 0-100µA, 0-200µA
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 & Si type), Transistors (npn&pnp type)

II B.Tech I-Sem (ECE) P 3 C 2

(A0492123) SIGNALS AND SYSTEMS SIMULATION LAB

(Common to ECE & EIE)

OBJECTIVES:

- The main objective of the Lab is to give the introduction about all signals with the help of their characteristics using MATLAB. This lab also deals with signal processing operation to understand various systems and simulate them using MATLAB.

OUTCOMES:

- Students can perform various signal processing operation on MATLAB.

Minimum 8 experiments/programs to be conducted

1. Basic operations on Matrices.
2. Generation of various signals and sequences (Periodic and aperiodic). Such as unit impulse, unit step, square, saw tooth, triangular, sinusoidal, ramp, sinc function.
3. Operation on 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 or sequence and real imaginary parts of signals.
5. Convolution between signals and sequences.
6. Autocorrelation 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 realizability 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 zeros and poles and plotting the pole-zero maps in S-plane and Z-plane for the given transform functions.
13. Generation of Gaussian noise (real and complex), computation of its mean, M.S.Values and its skew, kurtosis and PSD, probability distribution function.
14. Sampling theorem verification.
15. Removal of noise by auto correlation/cross correlation in a given signal corrupted by noise.
16. Impulse response of a raised cosine filter.
17. Verification of Weiner-Khinchine relations.
18. Checking a Random process for stationary in wide sense.

Using Licensed MATLAB of version 7.0 and above

II B.Tech I-Sem (ECE) P 3 C 2

(A0293123) NETWORK ANALYSIS LAB

(Common to ECE & EIE)

OBJECTIVES:

- To understand various electrical circuit concepts..
- To understand the Network Topology & coupled circuits.
- To learn and analyze network theorem practically.
- To learn the synthesis of various networks.

OUTCOMES:

- Students become skilled in analysing various electrical circuits.
- Students can analyze various Network Topologies & coupled circuits and networks.

PART-A

1. Determine the total current for the Series and parallel resistive circuits using Pspice.
2. Calculate node voltages and branch currents for the given circuits.
3. For the series and parallel circuits determine the total impedance, phase angle, voltage across the parallel branches for the AC circuits.
4. Using Pspice determine the frequency at which the circuits resonance, also fine the voltage across the inductor, capacitor and Q factor of the given circuits.
5. Using Pspice calculates the effective inductance of the series and parallel coupled circuits.
6. Using Pspice find the complete expression the circuit when the switch is closed at t=0.
7. A series RLC circuits comprising R=10 Ω, L=0.5 H and C=1 μf is excited by a constant voltage source of 100 volts using Pspice obtain the expression for current.
8. Using Pspice find the Z, Y, transmission parameters for the given circuits.

PART-B

9. Verification of superposition & Reciprocity theorems.
10. Verification of maximum power transfer theorem. Verification on DC, Verification on AC with resistive and reactive loads.
11. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
12. Determination of two port network parameters – Z, Y parameters of the given network.

Note: Total 8experimentshas to be conducted. Choosing 4 from Part-A & all in Part-B.

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

II B.Tech, II-Sem (ECE) T C
3+1* 3

(A0405124) RANDOM VARIABLESAND RANDOM PROCESSES

OBJECTIVES:

- To understand the concepts of a Random Variable and operations that may be performed on a single Random variable.
- To understand the concepts of Multiple Random Variables and operations that may be performed on Multiple Random variables.
- To understand the concepts of Random Process and Temporal & Spectral characteristics of Random Processes.

OUTCOMES:

- A student will able to determine the temporal and spectral characteristics of random signal response of a given linear system.

UNIT I

RANDOM VARIABLE: Basic concepts of probability, Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties.

UNIT II

OPERATION ON ONE RANDOM VARIABLE – EXPECTATION : Introduction, Expected Value of a Random Variable, Function of a Random Variable, Moments about the Origin, Central Moments, Variance and Skew, Characteristic Function, Moment Generating Function, Transformations of a Random Variable: Monotonic Transformations for a Continuous Random Variable, Non-monotonic Transformations of Continuous Random Variable.

UNIT III

MULTIPLE RANDOM VARIABLES : Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density – Point Conditioning, Conditional Distribution and Density – Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem (Statement only).

UNIT IV

OPERATIONS ON MULTIPLE RANDOM VARIABLES: Expected Value of a Function of Random Variables: 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, and Linear Transformations of Gaussian Random Variables.

UNIT V

RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The Random 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, (N-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 Functions, Gaussian Random Processes, Poisson Random Process.

UNIT VI

RANDOM PROCESSES – SPECTRAL CHARACTERISTICS: The Power Density Spectrum and its Properties, Relationship between Power Spectrum and Autocorrelation Function, The Cross-Power Density Spectrum and its Properties, Relationship between Cross-Power Spectrum and Cross-Correlation Function.

Linear Systems with Random Inputs: Fundamentals of Linear System, Random Signal Response of Linear Systems– Convolution, Mean and Mean-squared Value of System Response, autocorrelation Function of Response, Cross-Correlation Functions of Input and Output, and Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and output.

TEXT BOOKS:

1. Probability, Random Variables & Random Signal Principles - Peyton Z. Peebles, TMH, 4th Edition, 2001.
2. Probability, Random Variables and Stochastic Processes – Athanasios Papoulis and S. Unnikrishna Pillai, PHI, 4th Edition, 2002.

REFERENCES:

1. Communication Systems Analog& Digital – R.P. Singh and S.D. Sapre, TMH, 1995.
2. Probability and Random Processes with Application to Signal Processing – Henry Stark and John W. Woods, Pearson Education, 3rd Edition,2001.
3. Probability Methods of Signal and System Analysis. George R. Cooper, Clave D. MC Gillem,Oxford, 3rd Edition, 1999.
4. Statistical Theory of Communication - S.P. Eugene Xavier, New Age Publications, 2003.
5. Signals, Systems & Communications - B.P. Lathi, B.S. Publications, 2003.

II B.Tech, II-Sem (ECE) T 3+1* C 3

(A0212124) ELECTRICAL TECHNOLOGY

(Common to ECE & EIE)

OBJECTIVE:

- This course introduces the working principles of different types of AC and DC motors, Generators and Transformers.
- This course introduces different types of AC and DC machines, Transformers
- It also helps to understand the construction and working of single phase motors and some special machines
- To provide theoretical prerequisites necessary to do lab work on DC machines and AC machines

OUTCOMES:

- The student will understand the electromagnetic principles involved in electrical machines
- The student can differentiate the performance characteristics of different machine including special machines

UNIT –I

DC Generator: Principle of operation of DC Generator, Construction details of DC Generator - EMF Equation, simple numerical problems on E.M.F equation. Types of Generators-series shunt& compound Generator. Magnetization Characteristics of Separately excited Generators-Numerical problems on types of Generators.

UNIT –II

DC Motors: Principle of operation of DC Motor- Significance of Back E.M.F-Types of DC Motors-Applications of dc motors – 3 point starters for dc shunt motor-losses and efficiency-Swinburne's test, load test-speed control of DC shunt motor-Numerical problems on E.M.F equation and types of motors.

UNIT –III

Transformers: Principle of operation of Transformer-constructional features- Phasor Diagram on no load and load – equivalent circuit-losses, efficiency and regulation of a transformer, OC & SC tests on transformer-Numerical problems on E.M.F equation, Voltage Regulation and Efficiency.

UNIT –IV

Three phase Induction motor: Principle of operation of 3-phase Induction motor-slip ring and squirrel cage motors- slip torque characteristics-efficiency calculation-starting methods-Auto Transformer & DOL starter. Numerical problems on Torque, slip & efficiency.

UNIT –V

Alternators: Constructional features- Principle of operation-types-EMF equation- distribution and coil span factors- pre determination of regulation by synchronous impedance method – OC & SC test- Numerical problems

UNIT –VI

Single phase motors: Principle of operation of 1-phase Induction motor- constructional features-split phase motors,

Special machines: Construction and principle of operation of DC, AC Servomotors- AC tachometers- Stepper Motors - variable reluctance, permanent magnet and hybrid types(Two-Phase ON-Mode) – Synchros Transmitter & Receiver , Switched reluctance motor- universal motor- Applications.

TEXT BOOKS:

1. Principle of Electrical Engineering by V.K.Mehta, Rohith Mehta, S.Chand publications.
2. Electrical Technology-volume II – B L Theraja- S. Chand.

REFERENCE BOOKS:

1. Electrical Machinery- J B Guptha- katsonbooks.
2. Electrical Machines – I J Nagrath and D P Kothari- PHI Publications.
3. Generalized Theory of Electrical Machines by P.S.Bimbra, Khanna publication

II B.Tech, II-Sem (ECE) T C
3+1* 3

(A0406124) EM WAVES AND TRANSMISSION LINES

OBJECTIVES:

- To provide the basic skills required to understand, develop, and design various engineering applications involving electromagnetic fields.
- To lay the foundations of electromagnetism and its practice in modern communications such as wireless, guided wave principles such as fiber optics and electronic electromagnetic structures including those on the sub-micron scale.
- To provide basic laboratory exposure to electromagnetic principles and applications

OUTCOMES:

- Knowledge of basic wave propagation: To be able to discuss and deduce equations to describe wave propagation, to relate wave velocity and time delay, and to be able to formulate potential concepts to relate wave properties and their excitation. And should be able to specify the "constitutive relationships" for fields and understand why they are required.
- Have the ability to apply complex phasors (Fourier) to fields for sinusoidal waves.
- To have acquired knowledge of transmission lines for pulsed and sinusoidal steady state excitation; to have an understanding of wave interference and resonance on transmission lines; to be able to quantitatively deduce capacitive and inductive responses to pulsed excitation.
- To have acquired techniques for the measurement of basic transmission line parameters, such as the reflection coefficient, standing wave ratio, and impedance. Understanding of the Smith chart, its application to matching, and experimental verification.
- Have an ability to determine and describe static and dynamic electric and magnetic fields for technologically important structures: the coil, charge distributions, the dipole, the coaxial cable, dielectric and conducting spheres immersed in electric fields, and the depletion region of a p-n junction. Knowledge of, physical interpretation, and ability to apply Maxwell's equations to determine field waves, potential waves, energy and charge conservation conditions.
- Experimental measurement of voltages induced by time varying magnetic flux. Flux determination**.** A knowledge of and experimental measurement of the influence of boundaries on waves. Thus, knowledge of and the application of boundary conditions for fields, Brewster's angle to eliminate reflections and polarize radiation, total reflection from a boundary, evanescent fields, and some knowledge of their application to modern optics.
- Basic concept of the guiding of electromagnetic waves by constructive multiple reflections from conductors and dielectrics. Have some knowledge of cut-off, dispersion, and why no dispersive TEM waves in ideal coaxial lines and fibers are so useful. Some ability to use numerical techniques such as Mat lab and perhaps finite elements to solve and visualize electromagnetic.

UNIT I

Coordinate Systems, Cartesian coordinate system, polar coordinate system and spherical coordinate system, Vector Calculus: Curl and divergence, Vector identities, Illustrative problems.

UNIT-II

Static Electric Fields : 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, convection and conduction currents, Continuity Equation, Poisson's and Laplace's Equations, Illustrative Problems.

UNIT III

Static Magnetic Fields: Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Force due to magnetic fields, Ampere's Force Law, Related Problems.

UNIT IV

Time Varying EM Fields: Faraday's Law of induction 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, Pointing vector and pointing theorem, power loss in a plane conductor, Related Problems.

UNIT V

Uniform plane waves: Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, 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 types, Related Problems

UNIT VI

Transmission Lines: Types, Equivalent Electrical circuits, Transmission Line Equations, Primary & Secondary Constants, Characteristic Impedance, Propagation Constant, Phase and Group Velocities, VSWR, Infinite Line, Distortion – Distortion less and minimum attenuation condition, Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit Elements; λ/4, λ /2, λ /8 Lines, impudence transformations, smith chart-its configuration and applications, single stub and double stub matching.

TEXT BOOKS:

1. Elements of Electromagnetics – Matthew N.O. Sadiku, Oxford Univ. Press, 3rd ed., 2001.
2. Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7th ed., 2006.

REFERANCES:

1. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
2. Electromagnetic Field Theory and Transmission Lines – G.S.N. Raju, Pearson Edn. Pte. Ltd., 2005.
3. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001.

II B.Tech, II-Sem (ECE) T 3+1* C 3

(A0407124) ELECTRONIC CIRCUITS ANALYSIS

(Common to ECE & EIE)

OBJECTIVES:

- To study the analysis and design of single stage and multistage amplify at low and high frequencies.
- Electrical equivalent model of transistor at low and high frequencies.
- Study of small signal and large signal amplifiers and their area of applications.
- To understand the concepts of feedback and their applications (Voltage feedback amplifiers and oscillators)

OUTCOMES:

- Depending upon requirement the student able to understand the concept of analysis of small signal and large signal amplifiers, feedback amplifiers.
- Student able to design the regulators using transistor.

UNIT-I

SINGLE STAGE AMPLIFIERS: Review of **s**mall signal equivalent model of BJT and JFET, Analysis of single stage transistor amplifier (CE, CB, and CC) using h-parameters: Input impedance, Output impedance voltage gain and current gain, Comparison of transistor configurations in terms of A_I , R_i , A_v , R_o, Analysis of single stage JFET amplifiers (CS, CG, and CD) using h-parameters, design consideration of small signal amplifiers, Illustrative problems.

UNIT-II

MULTI STAGE AMPLIFIERS: Millers Theorem, Different Coupling Methods used in Amplifiers-RC, Direct, Transformer coupled Amplifiers. Analysis of two stage (Cascaded) RC Coupled amplifiers (CE configuration). High input Resistance Transistor Circuits. Cascode Transistor Configuration, CE-CC Amplifiers. Two Stage RC Coupled JFET amplifier (in Common Source (CS) configuration, Illustrative problems).

UNIT-III

HIGH FREQUENCY TRANSISTOR CIRCUTS: Transistor at High Frequencies, Hybrid-□π Common Emitter Transistor Model, Determination of Hybrid- π Parameters, Variation of Hybrid Parameters with $|I_C|$, $|V_{CE}|$ and Temperature. The Hybrid-π CE Short Circuit Current Gain, CE Current Gain with Resistance Load, Gain Band width product, Design of High frequency Amplifier. Frequency Effects, Amplifier Analysis, Illustrative problems.

UNIT-IV

FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis, series and shunt regulators using transistor, Illustrative problems.

UNIT-V

OSCILLATORS: Condition for Oscillations. RC and LC type Phase Shift oscillators. Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of Oscillators, Illustrative problems.

UNIT-VI

LARGE SIGNAL AMPLIFIERS: Importance of Power Amplifiers, Types of Power amplifiers, Class A Power Amplifier, Maximum Efficiency of Class A amplifier, Transformer Coupled Audio amplifier, Types of Distortions in amplifiers, Push Pull amplifier (Class A, Class B), Complimentary Symmetry , Phase Inverters, Class C, D and S operations, Heat Sinks, Introduction to tuned amplifiers, Illustrative problems.

TEXT BOOKS :

1. Integrated Electronics – J. Millman and C.C. Halkias, Mc Graw-Hill, 1972.
2. Electronic Circuit Analysis and Design – Donald A. Neaman, Mc Graw Hill.

REFERENCES :

1. Electronic Devices and Circuits Theory – Robert L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition,2006.
2. Micro Electronic Circuits – Sedra A.S. and K.C. Smith, Oxford University Press, 5th ed.
3. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications, 2nd Edn.., 1998.
4. Electronic Devices and Circuits, Theodore F. Bogart Jr., J.S. Beasley and G. Rico, Pearson Edition, 6th Edition, 2004.

II B.Tech, II-Sem (ECE) T 3+1* C 3

(A0408124) PULSE AND DIGITAL CIRCUITS

(Common to ECE & EIE)

OBJECTIVES:-

- To study various wave shaping circuits and their applications.
- To study different circuits that produce non-sinusoidal waveforms(multi vibrators) and their applications
- To study various voltage time base generators and their applications.
- To study different logic families and their comparison.

OUTCOMES:

- Students will be able to design different pulse circuits based on the above concepts.

UNIT I:

LINEAR WAVE SHAPING: Introduction to Linear wave shaping, Applications of Linear wave shaping circuits, High-pass and Low-pass RC circuits and their response for sinusoidal and different non-sinusoidal inputs like step, pulse, square wave, Exponential and ramp waveforms, High Pass RC circuit as differentiator and Low Pass RC circuit as an integrator; Introduction to attenuators, applications of attenuators; RL and RLC circuits and their response for step input.

UNIT II:

SWITCHING CHARACTERISTICS OF DEVICES:- Diode as a switch, diode switching times: diode forward recovery time, diode reverse recovery time; Transistor as a switch, conditions for a transistor to act as a switch, Transistor switching times: delay time, rise time, transistor on-time, storage time, fall time, transistor off-time, improving transistor switching times, Design of a transistor switch.

UNIT III:

NON-LINEAR WAVE SHAPING : Introduction to non-linear wave shaping, Applications of non linear wave shaping circuits, Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper; Comparators, applications of voltage comparators; Introduction to clamping circuits, Clamping operation, Different clamping Circuits, Clamping circuit theorem.

UNIT IV:

MULTI VIBRATOR CIRCUITS: Introduction to multivibrators, Bistable Multivibrator: Analysis and design of Fixed-bias Binary, Symmetrical and unsymmetrical triggering of the Binary, working principle of emitter-coupled binary, Analysis and design of a Schmitt trigger circuit ; working principle and design of a collector-coupled n-p-n transistor monostable multi; Working principle and design of a collector-coupled astable multivibrator.

UNIT V:

VOLTAGE TIME BASE GENERATORS : Introduction to voltage time base generators, General features of a time base signal, methods of generating time base waveform, exponential sweep circuit, sweep circuit using UJT for the switch; Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator.

UNIT VI:

REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: Diode AND gate, Diode OR Gate & Transistor NOT gate, Diode-Transistor Logic (DTL), Resistor-Transistor Logic (RTL), Resistor-Capacitor-Transistor Logic (RCTL), Direct-Connected Transistor Logic (DCTL), Emitter-Coupled Logic (ECL) and Transistor-Transistor Logic (TTL) Families, and comparison among the logic families.

TEXT BOOKS:

1. Pulse, Digital and Switching Waveforms – Jacob Millman and Herbert Taub, McGraw-Hill, 1991.
2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002.

REFERENCES:

1. Pulse and Digital Circuits – A.Anand Kumar, PHI, 2005.
2. Wave Generation and Shaping - L. Strauss.
3. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman.
4. Pulse and Digital Electronics – G.K.Mithal.
5. Semiconductor Pulse Circuits With Experiments by Brinton B. Mitchell,Holt Rinehart & Winston; 1970 Edition.

II B.Tech, II-Sem (ECE) T 3+1* C 3

(A0404124) SWITCHING THEORY AND LOGIC DESIGN

(Common to ECE, EEE& EIE)

OBJECTIVES:

- Understand the different number system, its conversions and binary arithmetic.
- Know the fundamentals of Boolean algebra and theorems, Karnaugh maps including the minimization of logic functions to SOP or POS form.
- Analysis of logic circuits and optimization techniques to minimize gate count, signals, IC count, or time delay.
- To strengthen the principles of logic design and use of simple memory devices, flip-flops, and sequential circuits.
- To fortify the documentation standards for logic designs, standard sequential devices, including counters and registers.
- To understand design of logic functions using PLDs (ROM, RAM, PAL, PLA).

OUTCOMES:

- Ability to differentiate between analog and digital representations.
- Ability to convert a number from one number system to its equivalent in of the other number system.
- Cite the advantages of the octal and hexa decimal number systems and to understand the difference between BCD and straight binary.
- Ability to perform the three basic logic operations and construct the truth tables for the different types of gates. And Implement logic circuits using basic AND, OR and NOT gates.
- Ability to Use De-Morgan's theorem to simplify logic expressions and describe the concept of active LOW and active HIGH logic signals and Use Boolean algebra and K-map as tool to simplify and design logic circuits and Design simple logic circuits without the help of truth tables.
- Ability to Construct and analyse the operation of flip-flop andtroubleshoot various types of flip-flop circuits.

UNIT-I

NUMBER SYSTEMS, CODES AND BOOLEAN ALGEBRA: Philosophy of number systems – complement representation of Negative numbers, Binary arithmetic, Binary codes, Error Detecting &Error Correcting codes, Hamming codes. Fundamental postulates of Boolean algebra, Basic theorems and properties.

UNIT-II

SWITCHING FUNCTIONS AND IT'S MINIMIZATION: Switching functions, Canonical and standard forms, Algebraic simplification Digital Logic Gates, properties of XOR gates, Universal Gates ,Multilevel NAND/NOR realizations. K-map method, Prime Implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime - Implicant chart, simplification rules.

UNIT-III

COMBINATIONAL LOGIC DESIGN: Half adder, Full adder, Ripple carry adder, Carry look ahead generator, BCD adder, Half substractor, Full substractor, Encoder, Decoder, Multiplexer, De-Multiplexer, MUX realization of Switching functions, Parity bit generator, Code-converters, multiplier.

UNIT-IV

PROGRAMABLE LOGIC DEVICES, THRESHOLD LOGIC: Basic PLD's-ROM, PROM, PLA, PAL Realization of switching function using PLD's. Capabilities and limitations of Threshold gate, realization basic logic gates and universal logic gates using threshold gates, analysis of simple threshold gates.

UNIT-V

SEQUENTIAL CIRCUITS: Classification of sequential circuits, Basic Flip-Flops, Excitation and Characteristic Tables. Steps in Synchronous Sequential circuit design. Design of modulo-N counters, Ring and Johnson counters, Universal shift register, Serial Binary adder, Sequence Detector. FSM-capabilities and Limitations, Mealy and Moore models, Minimization of completely specified Sequential Machines using partition method.

UNIT-VI

ASM CHARTS: Salient features of the ASM chart, components ASM charts, difference between ASM chart and conventional flow chart, difference between ASM chart and state diagram, system design using control logic, examples sequence detector, MOD-N counter, binary multiplier.

TEXTBOOKS:

1. Switching & Finite Automata theory- Zvi Kohavi, TMH,2nd Edition.
2. Digital Design-Morries Mano, PHI, 3rd Edition,2006.
3. Switching Theory and Logic design-A. Anand Kumar,2008.

REFERENCES:

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

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SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

II B.Tech, II-Sem (ECE) T C
3 2

(A0009123) CORPORATE MANAGEMENT SKILLS

(Common to all branches)

(Skill Development Course)

OBJECTIVES:

- To improve the communication skills of the students.
- To raise the confidence of the students with respect to the inter-personal communication.
- To make them to habituate to the Team culture and Team Work.
- To ensure the students to take up the challenges of Group Discussion and Personal Interview.
- To improve the overall personality of the students.

OUTCOMES:

- Able to improve the communication skills.
- Able to obtain the confidence of students with respect to the inter-personal communication.
- Able to cultivate the Team culture and Team Work.
- Able to take the challenges of Group Discussion and Personal Interview.

UNIT I

Concept of Communication – Significance, Scope and functions of Business Communication – Process and dimensions of communication – Essentials of good communication – Channels of communication – Formal, informal communication – Upward, Downward, Horizontal communication – Grapevine Phenomenon.

UNIT II

Types of communication: **Verbal – Oral Communication:** Advantages and limitations of oral communication, written communication – Characteristics, significance, advantages & Limitations of written communication.

UNIT III

Nonverbal Communication: Sign language – Body language – Kinesics – Proxemics – Time language and Hap tics: Touch language.

UNIT IV

Interpersonal communication – Interpersonal communication – Communication models: Exchange theory – Johari window – Transactional analysis, Communication styles.

UNIT V

Managing Motivation to Influence Interpersonal communication – Inter-personal perception – Role of emotion in inter personal communication.

UNIT VI

Barriers to communication: Types of barriers – Technological – Socio-Psychological barriers – Overcoming barriers. Listening – Types of listening – Tips for effective listening.

REFERENCES:

1. Business Communication, Meenakshi Raman, Oxford University Press.
2. Business Communication, Raymond V.Lesikar, Neeraja Pandit et al.,TMH
3. English for Business Communication, Dr.T.M Farhatulla, Prism books Pvt. Ltd.
4. Business Communications,Hudson,5/e,Jaico Publications
5. Business communication for managers, Penrose, Raspbery, Myers, Cengage
6. The Skills of Communication, Bills Scot, Gower publishing company Limited, London.
7. Effective Communication, Harward Business School, Harward Business Review No.1214.
8. Essentials of Business Communication, Rajendra Pal, JS.Korlahhi, S.Chand

II B.Tech, II-Sem (ECE) P 3 C 2

(A0493124) ELECTRONIC CIRCUIT ANALYSIS LAB

(Common to ECE & EIE)

OBJECTIVES

- Help students make transition from analysis of electronic circuits to design of electronic circuits.
- To understand the Analysis of transistor at high frequencies.
- To understand the concept of designing of tuned amplifier.
- The student will construct and analyze voltage regulator circuits.
- To understand the circuit configuration and the principle operation of converters, including diode rectifiers, controlled AC-DC converters and DC choppers

OUTCOMES:

- The ability to analyze and design single and multistage amplifiers at low, mid and high frequencies.
- Designing and analyzing the transistor at high frequencies.
- Determine the efficiencies of power amplifiers.
- Determine Frequency response and design of tuned amplifiers.
- Able to Analyze all the circuits using simulation software and Hardware.

I) Design and Simulation in Simulation Laboratory using Multisim OR Pspice OR Equivalent Simulation Software. (any four of the following)

1. Common Emitter and Common Source amplifier
2. Two Stage RC Coupled Amplifier
3. Current shunt Feedback Amplifier
4. Cascade Amplifier
5. Wien Bridge Oscillator using Transistors
6. RC Phase Shift Oscillator using Transistors
7. Class A Power Amplifier (Transformer less)
8. Class B Complementary Symmetry Amplifier
9. High Frequency Common base (BJT) / Common gate (JFET) Amplifier.

II) Testing in the Hardware Laboratory

A) Any two circuits simulated in Simulation laboratory

B) Any two of the following

1. Class A Power Amplifier (with transformer load)
2. Class B Power Amplifier
3. Single Tuned Voltage Amplifier
4. RC Phase Shift Oscillator
5. Wien Bridge Oscillator
6. Crystal Oscillator

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II B.Tech, II-Sem (ECE) P 3 C 2

(A0494124) PULSE AND DIGITAL CIRCUITS LAB

(Common to ECE & EIE)

OBJECTIVES:

- To generate Different types of non-sinusoidal signals.
- To generate and processing of non-sinusoidal signals.
- To learn about Limiting and storage circuits and their applications.
- To learn about Different synchronization techniques, basics of different sampling gates and their uses.
- To obtain Basics of digital logic families.

OUTCOMES:

- Student understands the various design and analysis to generate various types of signals.
- Student can design various digital circuits based on the application and specifications.

Minimum 8 experiments to be conducted:

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clampers.
4. Transistor as a switch.
5. Study of Logic Gates & Some applications.
6. Study of Flip-Flops & some applications.
7. Sampling Gates.
8. Astable Multivibrator.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.

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II B.Tech, II-Sem (ECE) P 3 C 2

(A0298124) ELECTRICAL TECHNOLOGY LAB

(Common to ECE & EIE)

OBJECTIVES:

- To provide practical experience in observing the performance of DC and AC machines, Transformers
- To study the behavior and characteristics of different machines

OUTCOMES:

- The student will have clear understanding on the working of different types AC and DC machines and their performance characteristics

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

1. OCC test on dc generator.
2. Load Test on DC shunt motor.
3. Load test on DC series motor.
4. Swinburne's test on DC Shunt motor.\
5. Speed control of DC Shunt motor by Armature control method.
6. Speed control of DC Shunt motor by Field control method.
7. OC & SC test on 1 phase Transformer (Efficiency)
8. OC & SC test on of 1 phase Transformer (regulation)
9. Load test on 3-phase Induction motor
10. Regulation of Alternator by using Synchronous Impedance methods.
11. Characteristics of Synchro.

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III B.Tech, I-Sem (ECE) T 3+1* C 3

(A0411125) ANALOG COMMUNICATIONS

OBJECTIVES:

- To study the fundamental concept of the communication systems.
- To study various analog modulation techniques.
- To study various transmitters and receivers.
- To study the influence of noise and communication systems.

OUTCOMES:

- The students will acquire knowledge on the basic concepts of communication system, types od modulation techniques and their relative performance.
- The student will have idea about the effect of noise on communication system.

UNIT I

INTRODUCTION TO COMMUNICATION SYSTEMS: Communication process, Elements of Communication Systems; Types of communication systems, its frequency ranges, Modulation: Need for Modulation, Types of modulation: AM, FM, PM, Advantages, Disadvantages and Applications.

UNIT II

LINEAR CW MODULATION: Introduction, Mathematical Representation of AM, single tone modulation index and multi tone modulation index, Power Relationships, AM signal generation (Square law, switching modulation), demodulation (Envelop detector), Virtues and Limitations of AM.

DSB-SC: Mathematical Representation of DSB-SC, DSB-SC generation (Ring modulation), Demodulation: Coherent detection, filtering of AM Signals and Spectra, DSB signals and spectra.

SSB-SC: Filtering of sidebands, SSB signal generation and demodulation using Hilbert transform, VSB Generation and demodulation, illustrative problems.

UNIT III

ANGLE CW MODULATION: Introduction, Types of FM, Mathematical representation of FM, Modulation index, Deviation sensitivity, Deviation ratio, Transmission bandwidth of FM (Carson's rule), Narrow band FM, Wide band FM, generation of FM: Direct FM, indirect FM, demodulation of FM. Voltage and Power for FM, Pre-emphasis and De-emphasis, Illustrative Problems.

PM: Introduction, Narrow band PM, Phase modulation and indirect FM; FM demodulators, Slope detector, Balanced slope discriminators, Phase difference discriminators, Ratio detector, PLL Detectors, Distortion and Transmission estimates.

UNIT IV

PULSE MODULATION TECHNIQUES: Definition, Types: PAM, PWM, PPM, Sampling, Nyquist rate, Different sampling techniques, Generation and Detection of PAM, PWM, PPM.

UNIT V

NOISE IN COMMUNICATION SYSTEMS: Introduction, Noise in Base band Systems, Noise figure, different types of noises, System Model and Parameter, SNR at the output of a Base band System. Noise in AM systems: System model and parameter, Noise in DSB and SSB Systems. Noise in Angle modulation Systems: Output SNR in Angle Modulation, Threshold effects in Angle Modulation Systems. Improvement of SNR using Pre-emphasis and De-emphasis, Comparison of Continuous Wave Modulation.

UNIT VI

TRANSMITTERS AND RECEIVERS: AM TRANSMITTERS: Low level and high level transmitters, FM TRANSMITTERS: Armstrong FM transmitters, RECEIVERS: TRF receivers, super heterodyne receiver.

TEXT BOOKS:

1. Simon Haykin, "Communication Systems", Wiley-India edition, 3rd edition, 2010.
2. B.P. Lathi, & Zhi Ding, "Modern Digital & Analog Communication Systems", Oxford University Press, International 4th edition, 2010.

REFERENCES:

1. A.Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010.
2. Communication systems by Kennedy.
3. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.
4. Sham Shanmugam, "Digital and Analog Communication Systems", Wiley-India edition, 2006.
5. "Electronic Communications systems" Modulation and Transmission-Robert Schoenbeck, UBS Publications, New Delhi.

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III B.Tech, I-Sem (ECE) T C
3+1* 3

(A0210124) CONTROL SYSTEMS

(Common to ECE, EIE & EEE)

COURSE OBJECTIVES

- Be prepared to apply mathematics, established scientific and engineering knowledge, for the development and implementation of a broad range of electronic systems
- Be knowledgeable about current technologies and be prepared to adapt to technology advances and ensure professional growth through an appreciation for lifelong learning.
- Basic skill in methods of design and analysis across a broad range of electrical and computer engineering areas

COURSE OUTCOMES

- To know various applications and analytical methods of control systems

UNIT-I

INTRODUCTION: Concepts of control systems – Open loop and closed loop control systems and their differences, examples – Types of feedback control systems

Mathematical modeling of Electrical & Mechanical(translational & rotational) systems, differential equations-Electrical analogous (F-V,F-I) of mechanical system- use of Laplace transforms in control systems-Transfer function: concepts, features-Transfer functions of above systems

UNIT-II

BLOCK DIAGRAM REDUCTION & SIGNAL FLOW GRAPH REPRESENTATION: Block diagram representation of electrical systems and reduction techniques - Signal flow graphs and reduction using mason's gain formula- Transfer function of DC servomotor, AC servomotor

UNIT-III

TIME RESPONSE ANALYSIS: Definition & classification of time response- Standard test signals – Type & order of a system- Transient response of fist order and 2^{nd} order systems for step input- Transient response specifications- Steady state response- Steady sate errors and error constants- Effects of PD, PI & PID controllers.

UNIT- IV

STABILITY ANALYSIS IN S-DOMAIN: The concept of stability - Routh stability criterion, special cases, advantages and limitations

Root locus technique: The root locus concept, construction of root loci- Effects of adding poles and zero's to G(s) H(s) on the root loci.

UNIT- V

FREQUENCY RESPONSE ANALYSIS: Introduction – Steady state response to sinusoidal input (frequency response) - Bode diagrams- Phase margin and gain margin- Stability analysis from Bode plots- Determination of transfer function from Bode diagram- Polar plots - Nyquist plots- Stability analysis

UNIT – VI

STATE SPACE ANALYSIS: Concept of state, state variables and state model, derivation of state models from block diagrams- solving time invariant state equations –state transition matrix and its properties.

TEXT BOOKS:

1) Control System Engineering – I.J. Nagarath and M.Gopal, New age international (P) limited, 2^{nd} edition.
2) Automatic control systems – B.C. Kuo, Jhon wiley and son's 2003

REFERENCE BOOKS:

1) Modern control engineering – Katsuhiko Ogata, PHI, 3^{rd} edition1998
2) Control Systems Engineering- NISE, 3^{rd} Edition-John Wiley
3) Control systems – U A Bakshi & V U Bakshi, Technical Publications, Pune.

III B.Tech, I-Sem (ECE)

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(A0412125) ANTENNAS AND WAVE PROPAGATION

OBJECTIVES:

- To make the students to be aware of fundamentals of electromagnetic radiation: introduction to antenna and its basic parameters.
- To make them to design various types of antennas operation at different frequencies.
- To make them to learn how a radio wave propagates through carious layers of atmosphere and against its climatic changes.

OUTCOMES:

- With the knowledge of basic concepts of EM radiation and antenna, the students will be in a position to design various antennas: from simple single-wire antenna to complex antenna arrays.
- Students will be able to choose an appropriate antenna for a given set of requirements and specifications and can design it.
- With the basic concepts of radio wave propagation, the student will be able to decide which mode of wave propagation is best suitable for the given area of communications.

UNIT I

ANTENNA FUNDAMENTALS: Introduction, Radiation Mechanism – single wire, Two-wire, Current Distribution on a thin wire antenna of different lengths. Antenna Parameters - Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beam width, Beam Area, Radiation Intensity, Radiation resistance, Beam Efficiency, Directivity, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Height. Near-field and Far-field regions.

UNIT II

BASIC ANTENNA ELEMENTS: Retarded Potentials (Vector and Scalar Descriptions),Hertzian Dipole, Half-wave Dipole, Quarter-wave Monopole; Current Distribution, Evaluation of Field Components, Expression for Radiated Power and antenna parameters for Alternating Current-carrying Element, Half-wave Dipole and Quarter-wave Monopole; Small Loop Antenna, Comparison between Loop Antenna and Dipole, Illustrative problems.

UNIT III

ANTENNA ARRAYS: Introduction to Antenna Arrays, Purpose of antenna arrays; N-element Uniform Linear Arrays – Broadside Arrays (BSA), End-fire Arrays (EFA), Derivation of their characteristics, EFA with Increased Directivity, Comparison of BSA and EFA. Principle of Pattern Multiplication, Binomial Arrays; Effects of Uniform and Non-Uniform Amplitude Distributions. Related Problems.

UNIT IV

HF, VHF ANTENNAS: Classification of antennas based on different characteristics. HF,VHF Antennas: V-antennas, Rhombic Antennas and Design Relations, Helical Antennas– Significance, Geometry, basic properties; Design considerations, Modes of Helical antennas- Axial Mode and Normal Mode. Yagi - Uda Antenna Arrays, Folded Dipoles & their characteristics.

UNIT V

UHF AND MICRO-WAVE FREQUENCY ANTENNAS: Reflector Antennas: Flat Sheet and Corner Reflectors; Paraboloidal Reflectors– Geometry, Characteristics, Types of feeds. Cass grain feed system. Horn Antennas – Types, Optimum Horns, Design Characteristics of Pyramidal Horns; Lens Antennas – Geometry, Features, Types- Non-metallic & Metallic lens and Zoning, Patch and slot Antennas. Applications of all antennas,

Antenna Measurements - Introduction, Co-Ordinate System, Patterns to be measured, Pattern Measurement arrangement, Directivity and Gain Measurements (Comparison, Absolute and 3-Antenna Methods).

UNIT VI

WAVE PROPAGATION: Introduction-Frequency ranges and modes of propagations. Ground Wave Propagation– Characteristics, Parameters, Wave Tilt, Flat and Spherical Earth Considerations and Roughness Calculations.

Sky Wave Propagation – Formation of Ionospheric Layers and their Characteristics, Mechanism of Reflection and Refraction, Critical Frequency, MUF & Skip Distance –Optimum Frequency, LUHF, Virtual Height, Ionospheric Abnormalities, Ionospheric Absorption. Space wave propagation - Introduction, field strength variation with distance and height, effect of earth's curvature, M-curves and Duct propagation, scattering phenomena, fading path loss calculations.

TEXT BOOKS

1. Antennas and Wave Propagation- John D. Krauss and Ronald J. Marhefka and Ahmad S. Khan, 4th Edition, TMH, New Delhi.
2. Antenna Theory - C.A. Balanis, John Wiley & Sons, 2nd ed., 2001.

REFERENCE

1. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2nd Edition, 2000.
2. Antennas and Wave Propagation - GSN Raju, Pearson Education India, 2009.
3. Antennas and Wave Propagation – K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
4. Transmission and Propagation – E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5, Standard Publishers Distributors, Delhi.
5. Antennas and Wave Propagation by V.Soundararajan, SCITECH Publications.

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AUTONOMOUS

SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

III B.Tech, I-Sem (ECE)

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(A0413125) ANALOG IC APPLICATIONS

(Common to ECE & EIE)

OBJECTIVES:

- Study of OPAMPS, Classification of OPAMPs.
- To study and design various linear applications of OPAMPs.
- To study and design various nonlinear applications of OPAMPs.
- Study of Analog filters.
- Study of Timers and Phase Locked Loops.
- Study of D/A AND A/D converters.

OUTCOMES:

- Able to design OPAMPS and analyse different OPAMP circuits.
- Able to analyse and design various linear applications of OPAMPs.
- Able to analyse and design various nonlinear applications of OPAMPs.
- Able to analyse and design of Analog filters, Timers and Phase Locked Loops. And D/A AND A/D converters using OPAMP.

UNIT-I

INTRODUCTION TO OP-AMPS: Integrated circuits-types, classification, temperature ranges, power supplies, OP-Amp Block diagram, Differential amplifier circuit configurations, Characteristics of OP-Amps, ideal and practical OP-Amp specifications, DC and AC characteristics, 741 OP-Amp and its features, OP-Amp parameters, input and output offset voltages and currents, slew rate, CMRR, PSRR.

UNIT-II

LINEAR APPLICATIONS OF OP-AMPS: Inverting and non-inverting amplifier, adder, subtractor, integrator and differentiator, difference amplifier, instrumentation amplifier, AC amplifier, Voltage to Current, Current to Voltage converters, Buffers.

UNIT-III

NON LINEAR APPLICATIONS OF OP-AMPS: Non-linear function generation, comparators, Multivibrators, Triangular and square wave generators, Log and antilog amplifiers, precision rectifiers, IC 723 voltage regulators, fixed 3-terminal regulators.

UNIT-IV

ANALOG FILTERS: Introduction, Butterworth filters-first order, second order LPF, HPF filters. Band pass, Band reject and all pass filters, notch filters.

UNIT-V

TIMERS AND PHASE LOCKED LOOPS: Introduction to 555 Timer, functional diagram, Monostable and Astable operations and applications, Schmitt Trigger, PLL-Introduction, Block schematic, principles and description of individual blocks, Introduction to IC 566, VCO applications and details, study of IC 1596 and its applications (balanced modulator only).

UNIT–VI

D/A AND A/D CONVERTERS: Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC and different types of ADCs-parallel comparator type ADC, counter type ADC, successive approximation ADC and Dual slope ADC.DAC and ADC specifications

TEXT BOOKS:

1. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, 4th edition, PHI, 1987.
2. Operational Amplifiers & Linear ICs by David A. Bell, 2nd edition, Oxford University Press, 2010.

REFERENCES:

1. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2nd Edition, 2003.
2. Design with Operational Amplifiers & Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.

III B.Tech, I-Sem (ECE) T 3+1* C 3

(A1210125) COMPUTER ORGANIZATION

(Common to ECE, EEE & EIE)

OBJECTIVES:

- To understand the structure, function, characteristics and performance issues of computer systems.
- To understand the design of the various functional units of digital computers
- To understand I/O transfer mechanism, design of I/O circuit interfaces and example bus standards (like PCI, SCSI, USB)
- To understand the basic processing unit and how they are connected and how it generates control signals (using hardwired and micro programmed approaches)
- To understand the different types of memory and how they are related.
- To learn basics of Parallel Computing and Pipelining.

OUTCOMES:

- Students will learn about computer performance, computer design, and trade-offs between cost and performance as well as between hardware and software
- Students will formulate and solve problems, understand the performance requirements of systems
- Students will learn to communicate effectively and learn to think creatively and critically, both independently and with others.
- Students will learn about all the detailed design issues and circuits of each unit.

UNIT I:

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

UNIT II:

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS: Register Transfer language, Register Transfer, Bus and memory transfers, Arithmetic Micro operations, logic micro operations, shift micro operations **BASIC COMPUTER ORGANIZATION AND DESIGN**: Instruction codes, Computer Registers, Computer instructions, Instruction cycle, Memory- reference instructions, Input – Output and Interrupt.

UNIT III:

CENTRAL PROCESSING UNIT: Stack organization, Instruction formats, Addressing modes, Data transfer and manipulation, Program control **COMPUTER ARITHMETIC:** Fixed point operations - Addition and subtraction, multiplication, Division Algorithms

UNIT IV:

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

UNIT-V:

PIPELINE AND VECTOR PROCESSING: Parallel processing, Arithmetic pipeline, Instruction Pipeline, RISC Pipeline, Vector processing, Array Processors.

UNIT VI:

MULTI PROCESSORS: Characteristics of Multi Processors, Inter Connection Structures, Inter Processor Arbitration, Inter Processor Communication & Synchronization, Cache Coherence

TEXT BOOKS:

1. Computer Systems Architecture – M. Moris Mano, III Edition, Pearson/PHI (Units1,2,3,5,6)

REFERENCES:

1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, V Edition, McGraw Hill. (Unit 1 & 4)

III B.Tech, I-Sem (ECE) T 3+1* C 3

(A0410125) MICROPROCESSORS & MICROCONTROLLERS

(Common to ECE & EEE)

OBJECTIVES:

- To understand the architecture of 8085 & 8086 Microprocessor**.**
- To learn various 8086 Instruction set and Assembler Directives.
- To become skilled in 8086 Assembly Language programming.
- To understand programmable peripheral devices and their Interfacing.
- To understand and learn 8051 microcontroller.
- To learn 8051 assembly Language programming

OUTCOMES:

- Becomes skilled in various 8086 Instruction set and Assembler Directives
- Able to write8086 Assembly Language programs.
- Able to understand programmable peripheral devices and their Interfacing.
- Able to write 8051 assembly Language programs.

UNIT-I

8086 MICROPROCESSOR: Evaluation of microprocessors. **Overview of 8085:** Architecture, Pin diagram, addressing modes, register organization. **8086 Microprocesso**r: Register organization, architecture, signal description, physical memory organization, general bus operations, I/O addressing capability, special processor activities, Minimum mode and maximum mode of operation, Timing diagram.

UNIT-II

8086 INSTRUCTION SET AND ASSEMBLER DIRECTIVES: Addressing modes of 8086, Instruction set of 8086, Assembler Directives and operators.

UNIT-III

8086 ASSEMBLY LANGUAGE PROGRAMMING: 8086 Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-IV

PROGRAMMABLE PERIPHERAL DEVICES AND THEIR INTERFACING: Memory interfacing to 8086 (static RAM and EPROM). 8255 PPI-various modes of operation and interfacing to 8086. D/A and A/D converter interfacing, Stepper motor interfacing. Interrupt structure of 8086, Vector interrupt table. Interrupt service routines.8259 PIC architecture and interfacing cascading of interrupt controller and its importance.

UNIT-V

8051 MICROCONTROLLER: Architecture of 8051 microcontroller. Pin Diagram of 8051, and external memories, counters and timers, serial communication, interrupts.

UNIT-VI

8051 ASSEMBLY LANGUAGE PROGRAMMING: Instruction set of 8051, Addressing modes of 8051, Assembly Language Programming examples using 8051.

TEXT BOOKS:

1. Microprocessor Architecture, Programming and Applications with8085 By Ramesh S Gaonkar.
2. Advanced microprocessor and peripherals-A.K. Ray and K.M.Bhurchandi, 2nd edition, TMH, 2000.
3. 8051 microcontroller and embedded systems by mazidi and mazidi ,pearson education 2000.

REFERENCES:

1. Microprocessors Interfacing-Douglas V.Hall, Revised 2nd edition, 2007.
2. The 8088 and 8086 Microprocessors- Walter A. Triebel, Avtar Singh, PHI, 4th Edition, 2003.
3. 8051 Microcontroller-Internals, Instructions, Programming and Interfacing by Subrata Ghoshal, Pearson, 2010.

III B.Tech, I-Sem (ECE) T 3 C 2

(A0013125) PROFESSIONAL ETHICS AND SOFT SKILLS

(Soft Skill Development Course)

(Common to all branches)

OBJECTIVES

The recent past decades have witnessed a dilemma of performance on ethical grounds. A professional be able to carry out tasks and achieve success at societal level. The syllabus has been designed keeping in view of the needs and goals of the generation next undergraduates. It comprises essentials of professional ethics embedded with soft skills which in turn mould students as dynamic professionals. The course of **Professional Ethics and Soft Skills** has been designed with the following objectives.

- To ignite the spark of professionalism among students with the purpose to acquire success at societal level.
- To enable them to accomplish tasks balancing hard skills and soft skills.
- To develop critical thinking skills and emotions of students through recent research theories.
- The greatest contribution of this course shall be to shape human skills of students at the global level.

OUTCOMES

- Be able to acquire professional ethics & Job Etiquettes
- Be able to balance hard skills and soft skills.
- Considerable improvement in communicative ability.
- Increase in motivational level and Professional attitudes.
- Be able to possess wide range of relevant knowledge.

UNIT I

NATURE AND SCOPE OF ENGINEERING ETHICS: Definition, Nature, Scope – Moral Dilemmas – Moral Autonomy – Kohlberg's theory – Gilligan's theory, the characteristic traits of real professional, Moral Reasoning and Ethical theories – Theories of Right Action, Self – interest- Use of ethical Theories- case study.

UNIT II

PROFESSIONAL ETIQUETTES: Professional Etiquettes **–** Mobile Etiquettes – Email Etiquettes -Kinesics – Proxemics - Chronemics – Chromatics – Olfacts - Haptics – Case Study.

UNIT III

CORPORATE COMMUNICATION: Communication models- Types of Communication – downward and upward communication Business Deliberations – Meetings – Negotiation Skills - Case Study.

UNIT IV

SOFT SKILLS: Interpersonal Communication – Johari Window – Interpersonal conflict resolutions- Daniel Goleman's Emotional Intelligence.

UNIT V

GLOBAL ISSUES: Multinational corporations – cross-cultural communication-Environmental ethics – Computer – ethics –Terrel Ward Bynum's concept of computer ethics - Weapons developments- case study.

UNIT VI

INTRODUCTION TO INTELLECTUAL PROPERTY: Meaning and Types of Intellectual Property – recent developments of the copy right act – plagiarism – trademark protection – patent law.

TEXT BOOKS:

1. Charles D.Fleddermann [1999], *Engineering Ethics*, Prentice Hall Publishers, New Mexico.
2. Business Communication, P.D. Chaturvedi, Mukesh Chaturvedi

REFERENCES :

1. The ACE of Soft Skills(Attitude, Communication and Etiquette for success) by – Gopalaswamy Ramesh & Mahadevan Ramesh, Pearson 2010.
2. Essentials of Business Communication, Rajendra Pal, JS.Korlahhi, S.Chand
3. Intellectual Property Right , Deborah E. BouchouxS, Cengage, 2005
4. Business Ethics and Professional Values, A.B. Rao, Excel,2009
5. M.P. Raghavan [2006], Professional Ethics And Human Values, Scitech Publications, Chennai.

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(A0496125) ANALOG COMMUNICATIONS LAB

Minimum 8 experiments should be conducted:

1. Amplitude modulation and demodulation.
2. Diode detector characteristics.
3. Frequency modulation and demodulation.
4. Balanced modulator.
5. Pre-emphasis & de-emphasis.
6. Characteristics of mixer.
7. Digital Phase detector.
8. Phase locked loop.
9. Synchronous detector.
10. SSB system.
11. Spectral analysis of AM and FM signals using spectrum analyzer.
12. Squelch Circuit.
13. Frequency Synthesiser.
14. AGC Characteristics.

Equipment required for Laboratories:

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.

III B.Tech, I-Sem (ECE) P 3 C 2

(A0497125) MICROPROCESSORS & MICROCONTROLLERS LAB USING EMBEDDED'C'

OBJECTIVES:

- To become skilled in 8086 Assembly Language programming.
- To understand programmable peripheral devices and their Interfacing.
- To understand and learn 8051 microcontroller.
- To learn 8051 assembly Language programming

OUTCOMES:

- Able to write8086 Assembly Language programs.
- Able to understand programmable peripheral devices and their Interfacing.
- Able to write 8051 assembly Language programs.

Minimum **eight** Experiments to be conducted (**Four** from each section)

I) 8086 Microprocessor Programs using TASM/8086 kit.

1. Introduction to TASM Programming.
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Length of the string, String comparison.

Interfacing:

1. 8259 – Interrupt Controller and its interfacing programs
2. 8255 – PPI and its interfacing programs (A /D, D/A, stepper motor,)
3. 7-Segment Display.

II) Microcontroller 8051 Trainer kit Using Keil

1. Introduction to Keil µvision
2. Arithmetic operation – Multi byte Addition and Subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation.
3. Logic operations – Shift and rotate.
4. Sorting- Ascending and descending order.

Interfacing using 8051 Trainer kit:

1. Key board Interfacing
2. Seven Segment display
3. Switch Interfacing
4. Relay Interfacing
5. UART

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(A0498125) ANALOG IC APPLICATIONS LAB

(Common to ECE & EIE)

Minimum 8 experiments to be performed

1. OP AMP Applications – Adder, Subtractor, Comparator Circuits.
2. Active Filter Applications – LPF, HPF (first order)
3. Function Generator using OP AMPs.
4. IC 555 Timer – Monostable Operation Circuit
5. IC 555 Timer – Astable Operation Circuit.
6. IC 566 – VCO Applications.
7. Voltage Regulator using IC 723.
8. 4 bit DAC using OP AMP.
9. Schmitt trigger using 741 Op-amp.
10. Integrator and differentiator using 741 Op-amp.
11. V-I and I-V converter using Op-amp.
12. AC amplifiers-inverting, non-inverting, buffers

III B.Tech, II-Sem (ECE)

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(A0416126) DIGITAL SIGNAL PROCESSING

(Common to ECE, EEE& EIE)

OBJECTIVES:

- At the end of the course, the student should be able to:
- Program a DSP chip to filter signals using either assembly language or a C compiler for the chip. This filter could be a FIR or IIR filter. The student should understand how design algorithms for implementation.
- Understand how digital to analog (D/A) and analog to digital (A/D) converters operate on a signal and be able to model these operations mathematically.
- Use Z transforms and discrete time Fourier transforms to analyse a digital system.
- Design and understand simple finite impulse response filters
- Understand stability of FIR filters
- Quantization of different types of FIR filters (FIR)
- Choose the best filter effects and noise
- Pole-zero design of simple filters using real data
- Window method design structure for implementation

OUTCOMES:

- Ability to describe the Sampling Theorem and how this relates to Aliasing and Folding.
- Ability to determine if a system is a Linear Time-Invariant (LTI) System and Take the Z-transform of a LTI system.
- Ability to determine the frequency response of FIR and IIR filters.
- Ability to understand the relationship between poles, zeros, and stability and determine the spectrum of a signal using the DFT, FFT, and spectrogram.
- Ability to Design, analyze, and implement digital filters in Mat lab.

UNIT-I

INTRODUCTION: Review of Discrete time signals and sequences, Frequency domain representation of discrete time signals and systems, DTFT.

Discrete Fourier series: Properties of discrete Fourier series, DFS representation of periodic sequences, **Discrete Fourier transforms:** properties of DFT, linear convolution of sequences using DFT, computation of DFT. Relation between Z-Transform and DFS.

UNIT-II

FAST FOURIER TRANSFORMS: Radix-2 Fast Fourier transforms (FFT), decimation in time and decimation in frequency FFT algorithms, inverse FFT and FFT for composite N.

UNIT-III

REALIZATION OF DIGITAL FILTERS: Review of Z-transforms, applications of Z-Transforms, solution of difference equations of digital filters, block diagram representation of linear constant-coefficient difference equations, basic structures of IIR systems, basic structures of FIR systems, Lattice structures of IIR systems, Lattice structures of FIR systems. Conversion from Lattice structure to direct form, Conversion from direct from to Lattice structure, Lattice – ladder structure.

UNIT-IV

IIR DIGITAL FILTERS: Analog filter approximations-Butterworth and chebyshev, design of IIR digital filters from analog filters, Design examples, Frequency transformations in analog domain and Frequency transformations in digital domain, Illustrative Problems.

UNIT-V

FIR DIGITAL FILTERS: Characteristics of FIR digital filters, frequency response. Design of FIR digital filters using window techniques, frequency sampling technique, comparison of IIR and FIR filters, illustrative Problems.

UNIT-VI

MULTIRATE DIGITAL SIGNAL PROCESSING FUNDAMENTALS: Basic sample rate alteration devices, Multirate Structures for sampling rate Converters, Multistage design of decimator and Interpolator, Polyphase Decomposition, Nyquist filters, Applications of DSP.

TEXT BOOKS:

1. Digital signal processing, principles, Algorithms and applications: John G. Proakis, Dimitris G. Manolakis, Pearson Education/PHI, 4th ed., 2007.
2. Digital signal processing , A computer base approach- Sanjit K Mitra, Tata McGraw Hill, 3rd edition, 2009.
3. Discrete Time Signal Processing-A.V. Oppenheim and R.W. Schaffer, 2nd ed., PHI.

REFERENCES:

1. Digital signal processing: Andreas Antoniou, TATA McGraw Hill, 2006.
2. A Text book on Digital Signal processing – R S Kaler, M Kulkarni,, Umesh Gupta, I K International Publishing House Pvt. Ltd.
3. Digital signal processing: M H Hayes, Schaum's outlines, TATA Mc-Graw Hill, 2007.

III B.Tech, II-Sem (ECE) T 3+1* C 3

(A0417126) MICRO ELECTRONICS AND VLSI DESIGN

(Common to ECE & EIE)

OBJECTIVES:

- To understand VLSI circuit design processes.
- To understand basic circuit concepts and designing Arithmetic Building Blocks.
- To have an overview of Low power VLSI.

OUTCOMES:

- Will be able to do VLSI circuit design.
- Will be able to do basic circuit concepts and designing Arithmetic Building Blocks.

UNIT I

INTRODUCTION : Introduction to IC Technology – MOS, PMOS, NMOS, CMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallization, Encapsulation, Integrated Resistors and Capacitors, types of packages sets significance.

UNIT II

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

UNIT III

VLSI CIRCUIT DESIGN PROCESSES: MOS Layers, Stick Diagrams, Design Rules and Layout: Lambda based CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates.

UNIT IV

BASIC CIRCUIT CONCEPTS: Sheet Resistance R_S and its concept to MOS, Area Capacitances of layers, standard unit of capacitance Cg, area capacitance calculations, The Delay unit, Inverter delays, estimation of CMOS inverter delay, Wiring Capacitances, Choice of layers.

UNIT V

DESIGNING ARITHMETIC BUILDING BLOCKS: Introduction; The Adders: Definition, the Full adder: Circuit design consideration, The Binary adder: Logic design consideration; The Multiplier: Definition, Partial product generation, Partial product accumulation, Final addition, Multiplier summary.
Introduction to FPGAs, CPLDs architectures and Standard Cells.

UNIT VI

INTRODCTION TO LOW POWER VLSI: Introduction, over view of power consumption, low power design through voltage scaling, estimation and optimization of switching activity.

TEXTBOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition.
2. CMOS digital integrated circuits analysis and design by Sung-Mo Kand and Yusuf Leblebici, Tata McGraw Hill, 3rd edition.

REFERENCES:

1. Introduction to VLSI Circuits and Systems - John .P. Uyemura, JohnWiley, 2003.
2. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
3. VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.
4. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, 1999.
5. Digital Integrated Circuits – A design perspective, John M. Rabaey, Anantha Chandrakasan, Borivoje Nikolic, Pearson Education, 2rd Edition.

III B.Tech, II-Sem (ECE)

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(A0506124) OBJECT ORIENTED PROGRAMMING

(Common to CSE, ECE & EEE)

OBJECTIVES:

After taking this course, the student should be able to:

- Describe the Windows event-driven programming model
- Build simple JAVA applications according to the model
- Write fluent JAVA code for creating classes
- Use JAVA variables, data, expressions and arrays
- Design and create forms, menus and controls
- Write clear, elementary Java programs (applets and applications)
- Use a Java-enabled browser and/or the applet viewer to execute Java applets
- Use the Java interpreter to run Java applications
- Design and construct effective graphic user interfaces for application software.
- Use Java Beans, RMI to build complex business applications

OUTCOMES:

- Understand the syntax and concepts of JAVA
- Write JAVA programs for processing data
- Write JAVA programs to interface with windows.
- Write JAVA programs that use data from flat files and databases.
- Develop programs with GUI features such as dialog boxes, menus etc.
- Write JAVA programs that form the GUI front-end for database applications.
- Write applications using distributed objects.
- A passing student shall demonstrate knowledge of GUI-based event-driven programming in a working.
- Program assignment utilizing Java GUI components, event listeners and event-handlers.

UNIT I

Introduction To Java – Introduction to OOP, OOP Concepts, History of Java, Java buzzwords, How Java differs from C , Structure of Java Program, data types, variables, constants, type conversion and casting, enumerated types, scope and life time of variables, operators, expressions , control flow- conditional statements, break and continue, simple java program, arrays, parameter passing, static fields and methods, access control, this, overloading methods and constructors, recursion, garbage collection.

UNIT II

Inheritance –Inheritance concept, Super and Sub classes, Member access rules, types of Inheritance, super uses, final classes and methods, casting, polymorphism- dynamic binding, method overriding, abstract classes and methods, the Object class and its methods.

UNIT III

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

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

UNIT IV

Files – streams, text Input/output, binary input/output, random access file operations, File management using File class, Using java.io.

Strings: Strings, string functions.

UNIT V

Exception handling – benefits of exception handling, exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, rethrowing exceptions, built in exceptions, creating own exceptions.

Multithreading - Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads, thread deadlock.

UNIT VI

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

TEXT BOOKS

1. Java; the complete reference, 7th editon, Herbert schildt, TMH.
2. Understanding OOP with Java, updated edition, T. Budd, pearson eduction.

REFERENCES

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.
2. An Introduction to OOP, second edition, T. Budd, pearson education.
3. Introduction to Java programming 6th edition, 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, seventh Edition, Pearson Education.
6. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.

III B.Tech, II-Sem (ECE) T 3+1* C 3

(A0418126) MICROWAVE ENGINEERING

OBJECTIVES:

- To analyse micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
- To Use S-parameter terminology to describe circuits.
- To explain how microwave devices and circuits are characterized in terms of their "S" Parameters.
- To give students an understanding of microwave transmission lines.
- To Use microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc..
- To give students an understanding of basic microwave devices (both amplifiers and oscillators).
- To expose the students to the basic methods of microwave measurements

OUTCOMES:

- Ability to analyze micro-wave circuits incorporating hollow, dielectric and planar waveguides, transmission lines, filters and other passive components, active devices.
- Ability to Use S-parameter terminology to describe circuits and to explain how microwave devices and circuits are characterized in terms of their "S"- Parameters.
- Ability to understanding of microwave transmission lines and how toUse microwave components such as isolators, Couplers, Circulators, Tees, Gyrators etc.
- Ability to understanding of basic microwave devices (both amplifiers and oscillators) and to expose the students to the basic methods of microwave measurements.

UNIT I

Introduction, Microwave Spectrum and Bands, Applications of Microwaves.

Guided Waves: Parallel Plane Waveguides Introduction, Transverse Electric waves(TE), Transverse Magnetic waves(TM), TEM Modes – Concepts, expressions and Analysis, Cut-off Frequencies, Velocities, Wavelengths, wave impedance, attenuation factor, expressions, Microwave transmission lines: Rectangular Waveguides – 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; Power Transmission and Power Losses in Rectangular Guide, Illustrative Problems,

UNIT II

WAVEGUIDE COMPONENTS AND APPLICATIONS: Scattering Matrix– Significance, Formulation and Properties. S Matrix Calculations for – Two port Junction, E plane and H plane Tees, Magic Tee, Hybrid Ring, Directional Coupler-Two Hole type only. Ferrites - Composition and Characteristics, Faraday Rotation; Ferrite Components - Gyrator, Isolator, Circulator. Cavity Resonators– Introduction, Rectangular Cavities, Dominant Modes and Resonant Frequencies, Q factor and Coupling Coefficients. Illustrative Problems.

UNIT III

MICROWAVE TUBES – I: Limitations and Losses of conventional tubes at microwave frequencies. Microwave tubes – O type and M type classifications. O-type tubes : Two Cavity Klystrons – Structure, Re-entrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process and Small Signal Theory – Expressions for o/p Power and Efficiency. Reflex Klystrons – Structure, Applegate Diagram and Principle of working, Mathematical Theory of Bunching, Power Output, Efficiency, Electronic Admittance; Oscillating Modes and o/p Characteristics, Electronic and Mechanical Tuning. Illustrative Problems.

UNIT IV

MICROWAVE TUBES-II: HELIX TWTS: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process (qualitative treatment), Suppression of Oscillations, Nature of the four Propagation Constants, Gain Considerations.

M-type Tubes: Introduction, Cross-field effects, Magnetrons – Different Types, 8-Cavity Cylindrical Travelling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and π-Mode of Operation, Separation of π-Mode, o/p characteristics.

UNIT V

MICROWAVE SOLID STATE DEVICES: Introduction, Classification, Applications. TEDs - Introduction, Gunn Diode – Principle, RWH Theory, Characteristics, Basic Modes of Operation, Oscillation Modes, Varactor diode, parametric amplifiers, Brief Introduction to Avalanche Transit Time Devices - IMPATT and TRAPATT Diodes – Principle of Operation and Characteristics.

UNIT VI

MICROWAVE MEASUREMENTS: Description of Microwave Bench – Different Blocks and their Features, Precautions; Microwave Power Measurement – Bolometer Method. Measurement of Attenuation, Frequency, VSWR, Cavity Q. Impedance Measurements.

TEXT BOOKS :

1. Microwave Devices and Circuits – Samuel Y. Liao, PHI, 3rd Edition,1994.
2. Microwave Principles – Herbert J. Reich, J.G. Skalnik, P.F. Ordung and H.L. Krauss, CBS Publishers and Distributors, New Delhi, 2004.

REFERENCES :

1. Elements of Microwave Engineering – R. Chatterjee, Affiliated East-West Press Pvt. Ltd., New Delhi, 1988.
2. Foundations for Microwave Engineering – R.E. Collin, IEEE Press, John Wiley, 2nd Edition, 2002.
3. Microwave Engineering by Pozar,
4. Microwave Engineering and its applications by Om.P.Gandhi.
5. Microwave Circuits and Passive Devices – M.L. Sisodia and G.S.Raghuvanshi, Wiley Eastern Ltd., New Age International Publishers Ltd., 1995.
6. Microwave Engineering Passive Circuits – Peter A. Rizzi, PHI, 1999.
7. Electronic and Radio Engineering – F.E. Terman, McGraw-Hill, 4th ed., 1955.
8. Micro Wave and Radar Engineering – M. Kulkarni, Umesh Publications, 1998.

III B.Tech, II-Sem (ECE)

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(A0415125) DIGITAL IC APPLICATIONS THROUGH VHDL

(Common to ECE & EIE)

OBJECTIVES:

- To be able to use computer-aided design tools for development of complex digital logic circuits
- To be able to model, simulate, verify, analyze, and synthesize with hardware description languages
- To be able to design and prototype with standard cell technology and programmable logic
- To be able to design tests for digital logic circuits, and design for testability

OUTCOMES:

- Able to use computer-aided design tools for development of complex digital logic circuits.
- Able to model, simulate, verify, analyze, and synthesize with hardware description languages.
- Able to design and prototype with standard cell technology and programmable logic.
- Able to design tests for digital logic circuits, and design for testability.

UNIT I

CMOS LOGIC: Introduction to logic families, CMOS logic, CMOS steady state electrical behavioral, CMOS dynamic electrical behavior, CMOS logic families.

UNIT II

THE VHDL HARDWARE DESCRIPTION LANGUAGE: Design flow, program structure, types and constants, functions and procedures, libraries and packages.

THE VHDL DESIGN ELEMENTS: Structural design elements, data flow design elements, behavioral design elements, and time dimension and simulation synthesis.

UNIT III

COMBINATIONAL LOGIC DESIGN: Decoders, encoders, three state devices, multiplexers and demultiplexers, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, VHDL modes for the above ICs.

UNIT IV

DESIGN EXAMPLES (USING VHDL): Barrel shifter, comparators, floating-point encoder, dual parity encoder

UNIT V

SEQUENTIAL LOGIC DESIGN: Latches and flip-flops, counters, shift register, and their VHDL models.

UNIT VI

MEMORIES:

ROMs:Internal structure, 2D-decoding commercial types, timing and applications. Static RAM: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS. Dynamic RAM:Internal structure, timing, synchronous DRAMs.

TEXT BOOKS:

1. Digital Design Principles & Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3rd Ed., 2005.
2. Fundamentals of Digital Logic with VHDL Design – Stephen Brown and Zvonko Vramesic, McGraw Hill, 2nd Edition., 2005.

REFERENCES:

1. Digital System Design Using VHDL – Charles H. Roth Jr., PWS Publications, 2nd edition, 2008.
2. A VHDL Primer – J. Bhasker, Pearson Education/ PHI, 3rd Edition.

III B.Tech, II-Sem (ECE)

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(A0419126) DIGITAL COMMUNICATIONS

OBJECTIVES:

- The students to be able to understand, analyze, and design fundamental digital communication systems.
- The course focuses on developing a thorough understanding of digital communication systems by using a series of specific examples and problems.
- Illustrate and require the student to understand analysis and design of modern digital communication systems.
- Specific examples include digital modulators, receivers, optimum detectors and error correcting codes.

OUTCOMES:

- Students are able to analyze digital communication signals as vectors.
- Students understand the principles of maximum a posteriori and maximum likelihood detection.
- Students understand the basics of PAM, QAM, PSK, FSK, and MSK. They can analyze probability of error performance of such systems and are able to design digital communication systems based on these modulation techniques as block diagrams.
- Students understand the basics of information theory and error correcting codes.

UNIT I

DIGITIZATION TECHNIQUES FOR ANALOG MESSAGES-I: Introduction - Importance of Digitization Techniques, Elements of Pulse Code Modulation (PCM) - Generation and Reconstruction, Quantization and coding, Quantization error, PCM with Noise, Companding in PCM,

UNIT II

DIGITIZATION TECHNIQUES FOR ANALOG MESSAGES-II: Delta modulation, Adaptive Delta Modulation, Differential PCM systems (DPCM), Adaptive differential PCM systems.

UNIT III

BASE BAND DIGITAL TRANSMISSION: Digital Signals and Systems – Digital PAM Signals, Transmission Limitations, Power Spectra of Digital PAM, Noise and Errors – Binary Error Probabilities, Matched Filtering, Optimum filtering.

UNIT IV

BAND PASS DIGITAL TRANSMISSSION: Digital modulation formats, Coherent binary modulation techniques, Coherent quadrature modulation techniques, Non coherent binary modulation techniques, Comparison of binary and quaternary modulation techniques, M-ary modulation techniques.

UNIT V

INFORMATION THEORY: Uncertainty, information and entropy, source coding theorem, Huffman coding, discrete memory less channels, mutual information, channel capacity, channel coding theorem, differential entropy and mutual information for continuous ensembles, channel capacity theorem.

UNIT VI

CHANNEL CODING: Linear block codes, Cyclic codes: CRC, Golay codes, BCH codes, RS codes. Convolution codes.

TEXT BOOKS:

1. A. Bruce Carlson, & Paul B. Crilly, "Communication Systems – An Introduction to Signals & Noise in Electrical Communication", McGraw-Hill International Edition, 5th Edition, 2010 (1,2,3 units).
2. Digital communications - Simon Haykin, John Wiley, 2005. (4,5,6 units)

REFERENCES:

1. Herbert Taub & Donald L Schilling, "Principles of Communication Systems", Tata McGraw-Hill, 3rd Edition, 2009.
2. Digital Communications – John Proakis, TMH, 1983. Communication Systems Analog & Digital – Singh & Sapre, TMH, 2004.
3. Digital Communications by Bernard Sklar, Tata McGraw Hill.

III B.Tech, II-Sem (ECE) T 3 C 2

(A0432126) EMBEDDED 'C'

(SKILL DEVELOPMENT COURSE)

(COMMON TO ECE & EIE)

OBJECTIVES:

- To understand the fundamental concepts of Embedded systems.
- To learn the kernel of RTOS, architecture of ARM processor.
- To learn various syntax in embedded c
- To know various embedded Tools.

OUTCOMES:

- Learns the fundamental concepts of Embedded systems.
- Learns the kernel of RTOS, architecture of ARM processor
- Becomes skilled in embedded c programming.
- Becomes aware of various embedded Tools.

UNIT I

INTRODUCTION TO EMBEDDED SYSTEMS: Fundamentals of Embedded System- Definition, Purpose of Embedded System, real life examples of embedded systems, future of embedded systems, Core of Embedded systems, Classification of Embedded Systems- Small, Medium and Large Scale Embedded System, System On-Chip.

UNIT II

REAL-TIME OPERATING SYSTEMS [RTOS]: Types of operating systems - Real-Time Operating System-Definition, a brief evolutionary history, Types of Real time systems, Special Characteristics of Real-Time Systems,

Kernel: Overview, Architecture, Scheduling algorithms, Objects, Applications.

UNIT III

ARM PROCESSOR: Introduction to ARM processor – Its features, Architecture, Registers, Instruction set and Addressing Modes, Example programs.

UNIT IV

EMBEDDED 'C': Introduction, Purpose of the Standard, Guiding Principles, Comparison with 'C'; General Rules- Line Width Braces Parentheses, Common Abbreviations;

Data Types: -Naming Conventions, Fixed-Width Integers and Signed Integers, Floating Point, Structures and Unions; Modules-Naming Conventions, Header Files, Source Files, File Templates, Procedures -Naming Conventions, Functions, Function-Like Macros, Tasks, Variables-Naming Conventions, Initialization, Variable Declarations; Expressions and Statements, If-Else Statements, Switch Statements Loops, Unconditional Jumps. Preprocessor directives, Modifiers, Command line Arguments.

UNIT V

Embedded Tools: Debugging Techniques, Compilers, Cross compilers,

Keil: Introduction, features, Development tools, Testing sample programs.

UNIT VI

Design examples: Traffic light, Digital Camera, Home Automation.

TEXT BOOKS

1. Real-Time Concepts for Embedded system-Qing Li, Caroline Yao.
2. Embedded system Architecture, Programming and Design-Raj Kamal, Second Edition, TMH Companies.
3. Embedded C coding Standard –Michael Barr from Neutrino.

REFERENCE

1. Embedded/ Real-Time Systems – KVKK Prasad, Dreamtech Press, 2005.
2. An Embedded Primer – David E. Simon, Pearson Edition,2005
3. Computer as Components, Principles of Embedded Computing System Design.– Wayne Wolf, 2nd Edition.

RAJEEV GANDHI MEMORIAL COLLEGE OF ENGG.& TECH., NANDYAL-518 501

AUTONOMOUS

SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

III B.Tech, II-Sem (ECE) P 3 C 2

(A0595124) OBJECT ORIENTED PROGRAMMING LAB

(Common to CSE and ECE)

OBJECTIVES:

- To make the student operating systems.
- Learn a object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

OUTCOMES:

After Completion of the Lab Course student should be able:

- To make the student learn a object oriented way of solving problems.
- To teach the student to write programs in Java to solve the problems

Recommended Systems/Software Requirements:

- Intel based desktop PC with minimum of 166 MHZ or faster processor with at least 64 MB RAM and 100 MB free disk space.
- JDK Kit. Recommended

1) a) Write a Java program that prints all real solutions to the quadratic equation ax2 + bx + c = 0. Read in a, b, c and use the quadratic formula. If the discriminant b2 -4ac is negative, display a message stating that there are no real solutions.

   b) The Fibonacci sequence is defined by the following rule:

   The fist two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.

2) a) Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that integer.

   b) Write a Java program to multiply two given matrices.

3) Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (Use String Tokenizer class of java. util)

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

5) Write a Java program to illustrate method overloading.

6) Write a Java program that implements the Sieve of Eratosthenes to find prime numbers.

7) Write a Java program to sort a list of names in ascending order.

8) Write a Java program to implement the matrix ADT using a class. The operations supported by this ADT are:

   a) Reading a matrix. c) Addition of matrices.

   b) Printing a matrix. d) Subtraction of matrices.

   a) Multiplication of matrices.

   Write a Java Program to solve Tower's of Hanoi problem .

9) Write a Java Program that uses a recursive function to compute ncr. (Note: n and r values are given)

10) Write a Java program to perform the following operations:

   a) Concatenation of two strings.

   b) Comparison of two strings.

11) Implement the complex number ADT in Java using a class. The complex ADT is used to represent complex numbers of the form c=a+ib, where a and b are real numbers. The operations supported by this ADT are:

   a) Reading a complex number. d) Subtraction of complex numbers.

   b) Writing a complex number. e) Multiplication of complex numbers.

   c) Addition of Complex numbers. f) Division of complex numbers.

12) Write a Java program that makes frequency count of letters in a given text.

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

a) Inserting a sub-string in to the given main string from a given position.

b) Deleting n characters from a given position in a given string.

14) a) Write a Java program that checks whether a given string is a palindrome or not. Ex:

MADAM is a palindrome.

b) Write a Java program to make frequency count of words in a given text.

15) a) Write a Java program that reads a file name from the user, then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.

b) Write a Java program that reads a file and displays the file on the screen, with a line number before each line.

c) Write a Java program that displays the number of characters, lines and words in a text file.

d) Write a Java program to change a specific character in a file.

Note: Filename, number of the byte in the file to be changed and the new character are specified on the command line.

16) Write a Java program that:

i) Implements stack ADT.

ii) Converts infix expression into Postfix form

iii) Evaluates the postfix expression.

17) a) Write a Java program that creates three threads. First thread displays "Good Morning" every one second, the second thread displays "Hello" every two seconds and the third thread displays Welcome" every three seconds.

b) Write a Java program that correctly implements producer consumerproblem using the concept of inter thread communication.

III B.Tech, II-Sem (ECE) P 3 C 2

(A0482126) DIGITAL COMMUNICATIONS LAB

OBJECTIVES:

- To study the various steps involved in generating and degenerating different pulse modulation techniques.
- To study various modulation process.
- To study the study the generation and demodulation of PSK,DPSK,FSK.

OUTCOMES:

- Able to analyze generating and degenerating different pulse modulation techniques.
- Able to perform various modulation process.
- Able to acquire practical knowledge on digital communications and its applications.

Minimum of 8 experiments to be conducted (Four from each Part-A&B)

PART-A

1. Sampling Theorem – verification.
2. Time division multiplexing.
3. Pulse code modulation.
4. Differential pulse code modulation.
5. Delta modulation.
6. Frequency shift keying.
7. Differential phase shift keying.
8. QPSK modulation and demodulation.

PART-B

Modeling of Digital Communications using MATLAB

1. Sampling Theorem – verification.
2. Pulse code modulation.
3. Differential pulse code modulation.
4. Delta modulation.
5. Frequency shift keying.
6. Phase shift keying.
7. Differential phase shift keying.
8. QPSK modulation and demodulation.
9. Channel and its characteristics.

Equipment required for Laboratories:

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 Digital Communication
7. Components
8. Radio Receiver/TV Receiver Demo kits or Trainees.

III B.Tech, II-Sem (ECE) P 3 C 2

(A0483126) DIGITAL IC APPLICATIONS USING VHDL & VERILOG LAB

OBJECTIVES:

- To use computer-aided design tools for development of complex digital logic circuits.
- To model, simulate, verify, analyze, and synthesize with hardware description languages.
- To design and prototype with standard cell technology and programmable logic.
- To design tests for digital logic circuits, and design for testability.

OUTCOMES:

- Able to use computer-aided design tools for development of complex digital logic circuits.
- Able to model, simulate, verify, analyze, and synthesize with hardware description languages.
- Able to design and prototype with standard cell technology and programmable logic.
- Able to design tests for digital logic circuits, and design for testability.

Simulate the internal structure of the following Digital IC's using VHDL & VERILOG and verify the operations of the Digital IC's (Hardware) in the Laboratory
Minimum 8 experiments to be conducted

1. Logic Gates- 74XX
2. Half Adder, Full Adder
3. Ripple Carry Adder
4. 3-8 Decoder -74138
5. 8-3 Encoder- 74X148
6. 8 x 1 Multiplexer -74X151
7. 4 bit Comparator-74X85
8. D Flip-Flop 74X74
9. Decade counter-74X160
10. Mod-Counters
11. Universal shift register -74X194
12. Ring counter
13. Johnson counter
14. RAM, ROM

IV B.Tech, I-Sem (ECE)

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(A0014125) MANAGEMENT SCIENCE

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

OBJECTIVES:

- To know the concept of management, administration.
- To know the personnel management and human research management.
- To know and analyze the steps involved in the corporate planning process.
- To understand present effective production techniques.

OUTCOMES:

- Students will able to know how to design the plant layout and location.
- Students will able to know importance of human resource department in organization.
- Students will able to know how the SWOT analysis helps to generate alternative corporate strategies.
- Students will able by using the contemporary practices how to survive in competitive global market.

UNIT-I

INTRODUCTION TO MANAGEMENT: Concepts of Management – Nature, Importance and Functions of Management, Taylor's Scientific Management Theory, Fayol's Principles of Management, Mayo's Hawthorne Experiment, Maslow's Theory of Human Needs, Douglas McGregor's Theory X and Theory Y, Herzberg's Two-Factor Theory of Motivation

UNIT-II

BASIC ISSUES IN ORGANIZATION: Designing Organic Structures of Organization (Line organization, Line and staff organization, Functional organization, Committee organization, Matrix organization, Virtual organization, Cellular organization, Team structure, Boundary less organization and Departmentation, Leadership Styles, Social responsibilities of Management

UNIT-III

OPERATIONS MANAGEMENT: Principles and Types of Plant Layout-Methods of production (Job, batch and Mass Production), Materials Management: Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records, Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle., Channels of distribution.

UNIT-IV

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

UNIT-V

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-VI

WOMEN ENTREPRENEURSHIP: Scope of Entrepreneurship among women- Promotional efforts supporting Women Entrepreneurs in India – Opportunities for women entrepreneurs – Challenges/Problems of Women Entrepreneurs – Successful cases of Women Entrepreneurs.

TEXT BOOK:

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

REFERENCE BOOKS:

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2007.
2. Koontz & Weihrich: Essentials of Management, 6/e, TMH, 2007.
3. Thomas N.Duening & John M.Ivancevich Management—Principles and Guidelines, Biztantra,2007.
4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2007.
5. Memoria & S.V.Ganker, Personnel Management, Himalaya, 25/e, 2007.
6. Schermerhorn: Management, Wiley, 2007.

IV B.Tech, I-Sem (ECE)

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(A0421127) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

OBJECTIVES:

- In this subject, the student can able to read the basic characteristics and the errors associated with an instrument.
- Studies on various analysers and signal generators and can analyse the frequency component of a wave generated and its distortion levels.
- Studies on the difference between the various parameters which are to be measured that are getting out from the different sensors.
- Studies on the basics of instrumentation and various signal measurements and can signal condition the circuit to the required level which are getting out from the sensor.

OUTCOMES:

- Student can able to do the various operation of measuring the physical parameters and using different instruments.
- Students can able the capability to design the circuit and can condition the circuit getting out from the sensors.
- Students can analyze which signal is getting out from the sensors & what type of instrument are to be used to measure that signal can be know well.
- The subject provides the students a clear in sight into the working level in measuring the signal and the instruments.

UNIT I:

ELECRICAL MEASUREMENTS: Electrical standards: ampere, voltage, resistance, capacitance & inductance standards-Suspension Galvanometer-Torque & deflection of the galvanometer-PMMC mechanism-DC Ammeters-DC voltmeters-Voltmeter sensitivity-Series and Shunt type ohm meters-Multimeters-Alternating current indicating instruments: electrodynamometer, rectifier type-Thermo instruments-Electrodynamometers in power measurements-Watt hour meter-Power factor meter.

UNIT II:

BRIDGE MEASUREMENTS: Resistance Measurement: Wheat stone bridge, Kelvin bridge- AC bridges: Condition for bridge balance- Inductance measurement: Maxwell Bridge, Hay Bridge- Capacitance measurement: Schering Bridge- Frequency measurement: Wein Bridge- Problems of shielding and grounding.

UNIT III:

ELECTRONIC MEASUREMENTS: FET input electronic volt-ohm-ammeters- AC voltmeters: rectifier type, true RMS type- Digital voltmeters: Ramp, Dual slope integration & SAR types – Q meter- Vector impedance meter-Vector volt meter- RF power and voltage measurement.

UNIT IV:

OSCILLOSCOPES: Oscilloscope block diagram- Vertical deflection system-Delay line-Horizontal deflection system-Vertical I/p and sweep generator signal synchronization-Oscilloscope probes: 1:1 probes, attenuator probes, active probes, current probes- Oscilloscope controls-Measurement of voltage, frequency, phase and pulse- Multi I/p oscilloscopes: dual beam, dual trace- Sampling oscilloscopes- Digital storage oscilloscopes.

UNIT V:

SIGNAL GENERATORS AND ANALYZERS: Low-frequency signal generators- Function generators- Pulse generators- RF signal generators- Frequency synthesized signal generator- Heterodyne wave analyzer-Harmonic distortion analysers- Spectrum analyser (Basics only).

UNIT VI:

FREQUENCY & TIME MEASUREMENT: Time & frequency standards - Frequency measurement - time base - Period measurement - Measurement errors.

TEXT BOOKS:

1. Modern Electronic Instrumentation and Measurement Techniques- Albert D. Helfrick, Willium D. Cooper- PHI-2002
2. Electronic Instrumentation and Measurements- David A. Bell-PHI-2nd edition-2003.

REFERENCES:

1. A course in Electrical and Electronic Measurements and Instrumentation- A.K. Sawhney- Dhanpati Rai&CO-7th edition-2005
2. Electronic Instrumentation- H Kalsi- TMH-3rd edition
3. Electronic Measurements and Instrumentation- Oliver and Cage- TMH

IV B.Tech, I-Sem (ECE)

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(A0422127) OPTICAL COMMUNICATIONS

OBJECTIVES:

- To learn the basic concepts of fibre optics communications.
- To make the students learn the system with various components or process for various applications.
- To enlighten the student with latest trends in optical communications.

OUTCOMES:

- Graduate will demonstrate the ability to design a system, component or process as per needs and specification.
- Students can learn about SONET/SDH and its application.

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.

UNIT II

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 III:

SIGNAL DISTORTION IN OPTICAL FIBERS: Attenuation, Absorption, Scattering and Bending losses, Core and Cladding losses. Material dispersion, Wave-guide dispersion, Polarization mode dispersion, Intermodal dispersion. Pulse broadening

UNIT IV

OPTICAL SOURCES AND DETECTORS: 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. Optical detectors- Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparision of Photodetectors.

UNIT V

OPTICAL FIBER CONNECTORS: Connector types, Single mode fiber connectors, Connector return loss. Fiber Splicing- Splicing techniques, Splicing single mode fibers. Fiber alignment and joint loss- Multimode fiber joints, single mode fiber joints,.

UNIT VI

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. WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion

TEXT BOOKS:

1. Optical Fiber Communications – Gerd Keiser, Mc Graw-Hill International edition, 3rd Edition, 2000.
2. Optical Fiber Communications – John M. Senior, PHI, 2nd Edition, 2002.

RERFERENCES :

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. Fiber Optic Communications – Joseph C. Palais, 4th Edition, Pearson Education, 2004.

IV B.Tech, I-Sem (ECE)

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(A0423127) DIGITAL IMAGE PROCESSING

(Common to ECE, EIE & CSE)

OBJECTIVES:

- To learn the fundamentals of Image Processing.
- To learn sampling and reconstruction procedures.
- To learn the various transforms used in image Processing.
- To study various concepts of image enhancement, reconstruction and image compression.
- To design image processing systems.

OUTCOMES:

- Develops ability to identify, formulate &solve problems involving images.
- Develops ability to design &conduct experiments, analyze &interpret image data.
- To design a software, Component or process as per needs &specifications.
- It will demonstrate the skills to use modern engineering tools, software's &equipment to analyze problems.
- Develop confidence for self-education ability for life-long learning.
- It will show the ability to participate &try to succeed in competitive Exams.

UNIT I

DIGITAL IMAGE FUNDAMENTALS: Introduction, I mage sensing & acquisition, Concept of gray levels. Gray level to binary image conversion. Sampling and quantization. Relationship between pixels. Imaging Geometry, operations on digital image: array Vs matrix, linear Vs non-linear, arithmetic operations, set and logical operations, spatial operations, vector and matrix operations, probabilistic methods.

UNIT II

IMAGE TRANSFORMS: 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Wavelet transform, Hotelling transform, comparison of different image transforms.

UNIT III

IMAGE ENHANCEMENT: Enhancement in Spatial Domain: Point processing. Histogram processing. Spatial filtering(Smoothing and sharpening), Enhancement in frequency domain: Basics of filtering in frequency domain, Image smoothing, Image sharpening, Homomorphic filtering, basics of colour image processing.

UNIT IV

IMAGE RESTORATION: Noise models, Degradation model, Restoration in the presence of noise only, Spatial filtering, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT V

IMAGE SEGMENTATION: Introduction, Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region based segmentation. Use of motion in segmentation.

UNIT VI

IMAGE COMPRESSION: Need for image compression , Redundancies and their removal methods, Fidelity criteria, Image compression models, Source encoder and decoder, Error free compression, Lossy compression.

TEXT BOOK :

1. Digital Image processing – R.C. Gonzalez & R.E. Woods, Addison Wesley/ Pearson education,2nd Education, 2002.
2. Digital image processing by S.Jayaraman, S.Esakkirajan & T.Veera Kumar, Tata McGraw Hill, 2010.

REFERENCES :

1. Fundamentals of Digital Image processing – A.K.Jain , PHI.
2. Digital Image processing using MAT LAB – Rafael C. Gonzalez, Richard E Woods and Steven L. Edition, PEA, 2004.
3. Digital Image Processing – William K. Pratt, John Wilely, 3rd Edition, 2004.
4. Fundamentals of Electronic Image Processing – Weeks Jr., SPIC/IEEE Series, PHI.

AUTONOMOUS

SCHOOL OF ELECTRONICS AND COMMUNICATION ENGINEERING

IV B.Tech, I-Sem (ECE)

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(A0424127) CELLULAR AND MOBILE COMMUNICATIONS

(ELECTIVE-I)

OBJECTIVES:

- To enable the student to learn basic analog cellular system and its working operation.
- To enable the student to study the design and evaluation of AMPS system.
- To enable the student to understand various digital cellular systems.
- To enable the student to understand various multiple access techniques.

OUTCOMES:

- With the knowledge acquired the student can design a cellular system according to traffic load and resource availability..
- Ability to work an advanced digital cellular system.

UNIT I

INTRODUCTION TO CELLULAR MOBILE SYSTEMS: Limitations of conventional mobile telephone systems, A basic cellular system, Performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Elements of mobile radio system design, General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in a omni directional Antenna system, Cell splitting,

UNIT II

INTERFERENCE: Introduction to Co-Channel Interference, real time Co-Channel interference, Co-Channel measurement, design of Antenna system, Antenna parameters and their effects, Non co-channel interference. **Cellsite and mobile antennas**: Omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas.

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 antenna height gain, form of a point to point model.

UNIT IV

FREQUENCY MANAGEMENT, CHANNEL ASSIGNMENT AND HANDOFF: Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells. Handoff: types of handoff, handoff initiation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff

UNIT V

INTRODUCTION TO CELLULAR SYSTEMS: Advantages of digital systems, Analogy to modulation schemes, Introduction to digital technology, ARQ techniques, Digital speech, Digital mobile telephony, practical multiple access schemes. Analog and Digital cellular systems.

UNIT VI

DIGITAL CELLULAR SYSTEMS: Global system for mobile(GSM), GSM architecture, GSM Air specifications , GSM Channels, Speech processing in GSM,CDMA

TEXTBOOKS :

1. Mobile Cellular Telecommunications – W.C.Y. Lee, Tata McGraw Hill, 2rd Edn., 2006.
2. Wireless Communications - Theodore. S. Rapport, Pearson education, 2nd Edn., 2002.

REFERENCES :

1. Wireless and Mobile Communications – Lee McGraw Hills, 3rd Edition, 2006.
2. Wireless Communication and Networking – Jon W. Mark and Weihua Zhqung, PHI, 2005.
3. Wireless Communication Technology – R. Blake, Thompson Asia Pvt. Ltd., 2004.

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IV B.Tech, I-Sem (ECE)

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(A0425127) SATELLITE COMMUNICATIONS

(ELECTIVE-I)

OBJECTIVES:

- To introduce the basic principles of Satellite Communication systems, orbital mechanics, launchers.
- To introduce the basic concepts and designing of Satellite links.
- To introduce the basic concepts of earth station transceiver.
- To know the basic concepts of various multiple access techniques and GPS systems.

OUTCOMES:

- Students can determine the location of Satellite.
- Students can design satellite uplink and downlink.
- Students can design earth station transmitter, receiver and antenna systems.

UNIT I

INTRODUCTION: Historical development of satellite, block diagram of Satellite Communication system, satellite orbits, satellite frequency bands, advantages and applications of satellite communications.

ORBITAL MECHANICS AND LAUNCHERS: Orbital Mechanics, Look Angle determination, Orbital perturbations, Orbit determination, launches and launch vehicles, Orbital effects in communication systems performance.

UNIT II

SATELLITE SUBSYSTEMS: Attitude and orbit control system, telemetry, tracking, Command and monitoring, power systems, communication subsystems, Satellite antennas.

UNIT III

SATELLITE LINK DESIGN: Basic transmission theory, system noise temperature and Gain to Temperature (G/T) ratio, Design of down link, up link design, Design of satellite links for specified Carrier to Noise(C/N).

UNIT IV

MULTIPLE ACCESS: Frequency division multiple access (FDMA): Intermodulation, Calculation of C/N with intermodulation. Time division Multiple Access (TDMA): Frame structure. Satellite Switched TDMA, Onboard processing, Demand Access Multiple Access (DAMA), Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT V

EARTH SEGMENT: Introduction, receive only home TV system, master TV antenna TV system, community antenna TV system, transmit receive earth stations.

LOW EARTH ORBIT AND NON-GEOSTATIONARY SATELLITE SYSTEMS: Orbit considerations, coverage and frequency considerations.

UNIT VI

SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM: Introduction, radio and satellite navigation, GPS Position Location principles, GPS Receivers and codes, Satellite Signal Acquisition, GPS Navigation Message, GPS Signal Levels, timing accuracy, GPS Receiver operation.

TEXT BOOKS:

1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Allnutt, WSE Wiley Publications, 2nd Edition, 2006.
2. Satellite Communications – Dennis Roddy, McGraw Hill, 3rd Edition, 2001.

REFERENCES:

1. Satellite Communications: Design Principles – M. Richharia, BS Publications, 2nd Edition, 2003.
2. Satellite Communication –Dr.D.C Agarwal, Khanna Publications, 5th Ed.
3. Fundamentals of Satellite Communications – K.N. Raja Rao, PHI, 2004
4. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud, 2nd Edition, Pearson Publications, 2003.
5. Satellite communications-Robert M.Gagliardi, CBS publications, first edition 1987.

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(A0426127) SPREAD SPECTRUM COMMUNICATIONS

(ELECTIVE-I)

OBJECTIVES:

- To understand the general concepts of spread spectrum
- To generate spread spectrum signals.
- To study various applications of spread spectrum.
- To learn the working operation of CDMA systems.

OUTCOMES:

- Students are able to understand the general concepts of spread spectrum.
- Students are familiar with the generation of generate spread spectrum signals.
- Students are familiar with various applications of spread spectrum and working operation of CDMA systems.

UNIT-I

FUNDAMENTALS OF SPREAD SPECTRUM: General concepts, Direct sequence (DS)), Pseudo noise (PN), Frequency hopping, Time hopping, Comparison of Modulation methods, Hybrid spread spectrum systems, Chirp spread spectrum, Base band modulation techniques.

UNIT-II

ANALYSIS OF DIRECT SEQUENCE SPREAD SPECTRUM SYSTEMS: Properties of PN sequences, Classes of periodic sequences, Properties of m sequences, Partial correlation, PN signal from PN sequences, Partial correlation of PN signals, The PN signal, De-spreading the PN signal, Interference rejection, Output signal to noise ratio, Anti-jam characteristics, Interception, Energy bandwidth efficiency.

UNIT-III

ANALYSIS OF AVOIDANCE-TYPE SPREAD SPECTRUM SYSTEMS: The frequency hopped signal, Interference rejection in a frequency hopping receiver, the time hopped signal.
GENERATION OF SPREAD SPECTRUM SIGNALS: Shift register sequence generators, discrete frequency synthesizers, SAW device PN generators, Charge coupled devices, Digital tapped delay lines.

UNIT-IV

DETECTION OF SPREAD SPECTRUM SIGNALS-TRACKING: Coherent direct sequence receiver, other method of carrier tracking, Delay lock loop analysis, Tau-Dither loop, Coherent carrier tracking, Non coherent frequency hop receiver.

DETECTION OF SPREAD SPECTRUM SIGNALS-ACQUISITION: Acquisition of spread spectrum signals, Acquisition cell by cell searching, Reduction of acquisition time, Acquisition with matched filters, Matched filters for PN sequences, Matched filters for frequency hopped signals, matched filters with acquisition-aiding waveform.

UNIT-V

APPLICATION OF SPREAD SPECTRUM TO COMMUNICATIONS: General capabilities of spread spectrum, Multiple access considerations, Energy and bandwidth efficiency in multi access, Selective calling and Identification, Anti-jam considerations, Error correction coding, Intercept consideration (AI), Miscellaneous considerations, Examples of spread spectrum system.

UNIT-VI

CODE DIVISION MULTIPLE ACCESS DIGITAL CELLULAR SYSTEMS: Introduction, Cellular radio concept, CDMA Digital cellular systems, Specific examples of CDMA digital cellular systems.

TEXT BOOKS:

1. George.R.Cooper and Clare D.McGillem, Modern Communications and Spread Spectrum, McGraw Hill.
2. Roger L.Peterson, Rodger E.Ziemer & David E.Ziemer & David E.Both, Introduction to spread spectrum communications, Prentice hall, 1995.

REFERENCE BOOKS:

1. Dr.Kamilo Feher, Wireless Digital Communications: Modulation & Spread Spectrum Applications, PHI, 1999.
2. Upena Datal, Wireless Communication, Oxford Higher Education, 2009.
3. Andrea Goldsmith, Wireless Communications, Cambridge University Press, 2005.

IV B.Tech, I-Sem (ECE)

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(A0509124) OPERATING SYSTEMS

(ELECTIVE-II)

(Common to ECE & CSE)

OBJECTIVES:

- This course deals with functions, structures and history of operating systems.
- To understand the design issues associated with operating systems.
- To understand various process management concepts including scheduling, synchronization, deadlocks.
- To be familiar with multithreading and the concepts of memory management including virtual memory.
- To understand the issues related to file system interface and implementation, disk management with protection and security mechanisms.
- Some example operating systems (Unix, Windows, Solaris etc)

OUTCOMES:

- At the end of the course the students knows the need and requirement of an interface between Man and Machine.
- To enable them to identify the difference between the system software and the application software and their design requirements.
- Students will be able to relate the features of operating systems and the fundamental theory associated with process, memory and file managements components of different operating systems.
- Students will learn about and understand theoretical concepts and programming constructs used for the operation of modern operating systems.
- Students will gain practical experience with software tools available in modern operating systems such as semaphores, system calls, sockets and threads

UNIT I

Introduction - what operating systems do, process management, memory management, protection and security, distributed systems, special purpose systems

System structure - operating system services, systems calls, types of system calls, system programs, operating system structure, operating systems generation, system boot.

UNIT II

Process concepts – overview, process scheduling, operations on process, inter-process communication.

Multithread Programming – overview, multithreading models, thread libraries

Process scheduling – basic concepts, scheduling criteria, processscheduling algorithms, algorithm evaluation

UNIT III

Concurrency - Process synchronization, the critical-section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors

Principles of deadlock: system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery form deadlock.

UNIT IV

Memory Management Strategies - Swapping, contiguous memory allocation, paging, structure of the page table, segmentation

Virtual memory management – background, demand paging, copy-on-write, page-replacement algorithms, Thrashing.

UNIT V

File system – file concept, Access Methods, Directory structure, protection.

File System implementation - File system structure, file system implementation, directory implementation, allocation methods, free-space management, Recovery.

UNIT VI

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

Tertiary storage devices-removable disks, tapes, future technology, performance issues.

TEXT BOOKS:

1. Operating System Concepts, Abraham Silberchatz, Peter B. Galvin, Greg Gagne, Eighth edition, John Wiley.

REFERENCES:

1. Operating Systems: Internals and Design Principles, Stallings, Sixth Edition–2009, Pearson Education.

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(A0521126) UNIX AND SHELL PROGRAMMING

(Common to ECE & CSE)

(ELECTIVE-II)

OBJECTIVES:

Upon successful completion of this course, you should be able to:

- Define and redirect standard files.
- Use the pipe operator to connect two commands.
- Use wildcard met characters and the history command to recall commands.
- Use shell variables.
- Define and use foreground and background processes.
- Define and use processes and co-processes.
- Use directory information in scripts.
- Set and use positional parameters and escape sequences.
- Pass arguments to shell scripts and test arguments.
- Use conditions, control statements and the if command in a decision.
- Debug scripts using execute trace and verbose trace.
- Use command substitution and Group shell commands.
- Create and use aliases and functions.
- Identify and use signals and handle signals in a shell script.
- Use integer and floating-point arithmetic.
- Perform command evaluation using eval.
- Use here documents, file I/O operators and command options processing.
- Use a lock file to synchronize access.

OUTCOMES:

- Be familiar with Unix and Linux operating Systems.
- Master the techniques to use a Linux system.
- Be familiar with the Unix file system and its basic operations.
- Be familiar with the Unix command interpreters.
- Master the techniques of shell programming.

UNIT I

Introduction: Why Unix?, Computer System, The Unix Environment, Unix structure, Accessing Unix, Common commands: date, cal, who, passwd, echo, man, lpr. Other useful commands: tty, clear, sty, script, uname, bc, tar, Vi editor: Editor concepts, The vi editor, Modes, Commands.

UNIT II

File Systems: File Names, File Types, Regular Files, Directories, File System Implementation, Operations unique to regular files, Operations unique to directories, Operations common to both.

Security & File Permissions: users and groups, security levels, changing permissions, user masks, changing ownership and group.

UNIT III

Introduction to Shells: Unix Session, Standard Streams, Redirection, Pipes, Tee Command, Command Execution, Command-Line Editing, Quotes, Command Substitution, Job Control, Aliases, Variables, Predefined Variables, Options, Shell/Environment Customization.

UNIT IV

Filters: Filters and Pipes, Concatenating files, Display Beginning and End of files, Cut and Paste, Sorting, Translating Characters, Files with Duplicate Lines, Count characters, Words or Lines, Comparing Files.

Grep : Operation, grep Family, Searching for File Content.

UNII V

awk: Execution, Fields and Records, Scripts, Operations, Patterns, Actions, Associative Arrays, String Functions, String Functions, Mathematical Functions, User – Defined Functions, Using System commands in awk, Applications, awk and grep.

UNIT VI

Interactive Korn Shell: Korn Shell Features, Two Special Files, Variables, Output, Input, Exit Status of a Command, eval command, Command Execution Process.

Korn Shell Programming: Basic Script concepts, Expressions, special Parameters and Variables, changing Positional Parameters, Argument Validation, Script Examples.

TEXT BOOKS:

1. Unix and shell Programming Behrouz A. Forouzan, Richard F. Gilberg.Thomson
2. Your Unix the ultimate guide, Sumitabha Das, TMH. 2nd Edition.

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(A0527127) WEB TECHNOLOGIES & PROGRAMMING

(ELECTIVE-II)

(Common to ECE, CSE & EEE)

OBJECTIVES:

- This course demonstrates an in-depth understanding of the tools and Web technologies necessary for business application design and development. The course covers client side scripting like HTML, JavaScript and server side scripting like servlets, JSPs. And also XML and web servers and database interfacing.

OUTCOMES:

- The main learning outcomes are:
- Development of a business application.
- Implementation of given client side and server side technologies.
- Design and develop static and dynamic web pages.
- Validate web page data with database data.

UNIT I

Introduction to HTML - HTML common tags, HTML program structure, Attributes, List, Tables, images, image maps, forms, Frames; Cascading Style sheets;

UNIT II

JavaScript - Introduction to Java Scripts, Objects in Java Script, Dynamic HTML with Java Script, Data Validation using Java Script.

UNIT III

XML - Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

UNIT IV

More On Servlets – Reading Initialization parameters, the javax.servlet HTTP package, Handling Http Request & Responses, Using Cookies-Session Tracking.

JSP Application Development - Generating Dynamic Content, Using Scripting Elements Implicit JSP Objects, Conditional Processing – Displaying Values Using an Expression to Set an Attribute, Declaring Variables and Methods Sharing Data Between JSP pages, Sharing Session and Application Data.

UNIT VI

Struts: Tomcat &Struts Installation, Struts Request life cycle, Struts Configuration file, Form Validation with Struts, Simple Struts application.

UNIT VI

Database Access - Database Programming using JDBC, Types of JDBC Drivers, Studying Javax.sql.* package, Accessing a Database from a JSP Page, Application – Specific Database Actions.

AJAX – Introduction, Background, How AJAX works, Common steps AJAX will follow.

TEXT BOOKS:

1. HTML Black Book – Steve Holzner.
2. Web Programming, building internet applications, Chris Bates 2nd edition, WILEY Dreamtech
3. The complete Reference Java 2 Fifth Edition by Patrick Naughton and Herbert Schildt. TMH
4. Java Server Pages –Hans Bergsten, SPD O'Reilly

REFERENCE BOOKS:

1. Programming world wide web-Sebesta, Pearson.
2. Core SERVLETS ANDJAVASERVER PAGES VOLUME 1: CORE TECHNOLOGIES By Marty Hall and Larry Brown Pearson.
3. Internet and World Wide Web – How to program by Dietel and Nieto PHI/Pearson Education Asia.
4. Jakarta Struts Cookbook , Bill Siggelkow, S P D O'Reilly
5. Murach's beginning JAVA JDK 5, Murach, SPD.
6. An Introduction to web Design and Programming –Wang-Thomson.

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(A0427127) VERILOG

(Skill Development Course)

OBJECTIVES:

- To understand the basics of the Language and its conventions.
- To form an introduction to design through Verilog.
- To design various components like Flipflops, decoders and multiplexers using different modelling.
- To form an introduction to the system tasks and functions in Verilog and their use in typical environment.

OUTCOMES:

- Student understands the basics of the Language and its conventions.
- Student becomes skilled in design through Verilog.
- Able to design various components like Flipflops, decoders and multiplexers using different modelling.
- Able to form an introduction to the system tasks and functions in Verilog and their use in typical environment.

UNIT I

Verilog Hardware Description Language: Program structure, Logic system, Nets, Variables, Constant, Vectors, Operators, Arrays, Logical operators and expressions, Compiler directives.

UNIT II

Design elements-1: Structural design elements, Dataflow design elements.

UNIT III

Design elements-2: Behavioural design elements, Time dimension, Simulation.

UNIT IV

Combination circuit modelling: Decoders (74X138), Priority encoder (74X148), Multiplexers (74X151), Comparators (74X85).

UNIT V

Sequential circuit modelling: Flip Flops (74X74); Counters: Binary counters (74X163); Decade counters (74X160); Shift registers (74X194); Ring counter, Johnson counter.

UNIT VI

Design examples: Dual priority encoder, Floating point encoder.

TEXT BOOKS:

1. Digital Design Principles & Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3rd Ed., 2005

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IV B.Tech, I-Sem (ECE) T 3 C 2

(A0485127) DIGITAL SIGNAL & IMAGE PROCESSING LAB

OBJECTIVES:

- To design real time DSP systems and real world applications.
- To implement DSP algorithms using both fixed and floating point processors.
- To generate the basis function of different transforms.
- To perform Image processing techniques.

OUTCOMES:

- Able to design real time DSP systems and real world applications.
- Able to implement DSP algorithms using both fixed and floating point processors.
- Able to perform various image processing applications

I. DSP LAB (Any 4 of the following):

1) Simulation of discrete time systems.
2) Verification of DTFT properties.
3) Stability test.
4) Effect of sampling in frequency and time domain.
5) Design of analog filters.
6) Realization of IIR and FIR transfer functions.
7) Design of IIR & FIR filters.
8) Design of tunable digital filters.
9) Multirate signal processing techniques: Decimation and interpolation.

II. **Image Processing LAB (Any 4 of the following)**:

1) Verification of image scaling properties.
2) To generate the basis function of different transforms.
3) Image enhancement using special domain and frequency domain techniques.
4) Image restoration using inverse and weiner filtering.
5) Edge detection using various operators.
6) Image compression techniques.

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(A0486127) MICROWAVE & OPTICAL COMMUNICATIONS LAB

OBJECTIVES:

- To verify the characteristics of various microwave components using microwave test bench.
- Initiate an expose the newcomers to exciting area of optical communication

OUTCOMES:

- Students acquire applications and testing of microwave components.
- Students acquire knowledge on the various applications of optical fiber communications
- Students develop confidence for self-education and ability for life -long learning.

Minimum 8 Experiments to be conducted:

Part – A (Any 4 Experiments):

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. Directional Coupler Characteristics.
5. Impedance Measurement.
6. Waveguide parameters measurement.
7. Scattering parameters of Directional Coupler.
8. Scattering parameters of Magic Tee.

Part – B (Any 4 Experiments):

1. Characterization of LED.
2. Characterization of Laser Diode.
3. Intensity modulation of Laser output through an optical fiber.
4. Measurement of Data rate for Digital Optical link.
5. Measurement of NA.
6. Measurement of losses for Analog Optical link.
7. Radiation Pattern Measurement of Antennas (at least two antennas).

IV B.Tech, II-Sem (ECE)

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(A0433128) RADAR SYSTEMS

OBJECTIVES:

- This course describes the understanding of the components of a radar system and their relationship to overall system performance
- To become familiar with design, operation, and applications of various types of radar systems
- To understand clutter and its effects of radar system performance and learn the principle of target track and various types of radar antennas.

OUTCOMES:

- To become familiar with fundamentals of radar.
- To gain in knowledge about the different types of radar and their operation.
- Need for signal detection in radar and various radar signal detection techniques.
- Will demonstrate the ability to design a system component or process as per needs & specifications.
- Will demonstrate the ability to identify, formulate & solve engineering problems.
- Will show the ability to participate and try to succeed in competitive examination

UNIT I

INTRODUCTION TO RADAR: Basic Radar, The Simple Form of the Radar Equation, Radar block Diagram, Radar Frequencies, Applications of Radar.

THE RADAR EQUATION: Introduction, detection of Signals in Noise, Receiver Noise and the Signal-to-Noise Ratio, Probability Density Functions, Probabilities of detection and False Alarm, Integration of radar Pulses, Radar Cross-section of Targets, Radar Cross-section Fluctuations, Transmitter Power, Pulse Repetition Frequency, Antenna Parameters, System Losses.

UNIT II

CW AND FREQUENCY-MODULATED RADAR: The Doppler Effect, CW Radar, Frequency-Modulated CW Radar, Air-Borne Doppler Navigation, Multiple –Frequency CW Radar.

UNIT III

MTI AND PULSE DOPPLER RADAR: Introduction to Doppler and MTI Radar, Delay-line Cancellers, Staggered Pulse-Repetition Frequencies, Doppler Filter Banks, Digital MTI Processing, Moving Target Detector, Limitations of MTI Performance, MTI from a moving Platform(AMTI), Pulse Doppler Radar.

UNIT IV

TRACKING RADAR: Tracking with Radar, Monopulse Tracking, Conical Scan and Sequential Lobing, Limitations of Tracking Accuracy, Low-Angle Tracking, Tracking in Range, Other Tracking Radar Topics, and Comparison of Trackers.

UNIT V

RECEIVERS AND DETECTION OF RADAR SIGNALS IN NOISE: The Radar Receiver, Noise Figure, Mixers, Low-Noise Front-Ends, Displays, Duplexers and Receiver Protectors; Matched-Filter Receiver, Correlation Detection, Detection Criteria, Detector Characteristics, Performance of Radar Operator, Automatic Detection, Constant-False-Alarm-Rate (CFAR) Receiver, ECMS & ECCMS.

UNIT VI

INFORMATION FROM RADAR SIGNALS: Introduction, Basic Radar measurements, , Theoretical accuracy of Radar measurements, Ambiguity diagram, Pulse compression, Target recognition.

TEXT BOOKS:

1. Introduction to Radar systems by Merrill I.Skolnik, Second edition, Tata McGraw Hill.

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(A0511125) COMPUTER NETWORKS

(ELECTIVE-III)
(Common to CSE & ECE)

OBJECTIVES:

- An understanding of the overriding principles of computer networking, including protocol design, protocol layering, algorithm design, and performance evaluation.
- An understanding of computer networking theory, including principles embodied in the protocols designed for the application layer, transport layer, network layer, and link layer of a networking stack.
- An understanding of specific implemented protocols covering the application layer, transport layer, network layer, and link layer of the Internet (TCP/IP) stack.
- An understanding of security issues.

OUTCOMES:

- Students will learn to list and classify network services, protocols and architectures, explain why they are layered.
- Student will learn to explain key Internet applications and their protocols.
- Students will learn to explain security issues in computer networks.
- To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
- To master the concepts of protocols, network interfaces, and Design/performance issues in local area networks and wide area networks.
- To be familiar with wireless networking concepts.
- To be familiar with contemporary issues in networking technologies.
- To be familiar with network tools and network programming.

UNIT I:

Introduction: Network Hardware, Network Software, References Models. **The Physical Layer:** Guided Transmission Media, Communication Satellites, The public Switched Telephone Network: Trunks and Multiplexing, Switching

UNIT II:

The Data Link Layer: Data link Layer Design Issues, Elementary Data Link Protocols, Sliding Window Protocols. Error Detection and Correction.

UNIT III:

The Medium Access Control Sub layer: Multiple Access protocols, Ethernet- Ethernet Cabling, Manchester Encoding, The Ethernet MAC Sub layer Protocol. The Binary Exponential Back off Algorithm, Ethernet Performance, Switched Ethernet, Fast Ethernet. Wireless LANs- The 802.11 Protocol Stack, The 802.11 Physical Layer, The 802.11 MAC Sub Layer Protocol, The 802.11 Frame Structure.

UNIT IV:

The Network Layer: Network Layer Design Issues, Routing Algorithms (Shortest path, Flooding, Distance Vector, Link state and Hierarchical routing, Broad cast routing, Multicast routing), Congestion Control Algorithms, Internetworking.

UNIT V:

The Transport Layer: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, The Internet Transport Protocols: TCP.

UNTI VI:

The Application Layer: DNS-The Domain Name System, Electronic Mail, The World Wide Web: Architectural overview. Definitions of encryption, Decryption, Advantages of network security.

TEXT BOOKS:

1. Computer Networks- Andrew S. Tanenbaum, Fourth Edition, Pearson Education.

REFERENCES:

1. Data Communications and Networking, Behrouz A. Forouzan, Fourth Edition, Tata McGraw Hill.

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(A0434128) DSP PROCESSORS ARCHITECTURE & APPLICATIONS

(ELECTIVE-III)

(Common to ECE & EIE)

OBJECTIVES:

- To understand the concept of DSP Architecture & comparison of this with that of microprocessors.
- To understand addressing modes, instruction sets , pipelining and application programs in TMS320C54XX processor
- To understand the architectural issues of programmable DSP devices and their relationship to the algorithmic requirements, architectures of commercially popular programmable devices and the use of such devices for software development and system design
- To highlight the suitability of programmable DSP devices for various application areas and motivate to design systems around these devices.

OUTCOMES:

- To become familiar with fundamentals of DSP Processors & architectures.
- To gain in knowledge about the different types of processors and their operation.
- Will demonstrate the ability to design a system component or process as per needs & specifications.
- Will demonstrate the ability to identify, formulate & solve engineering problems.

UNIT I:

ARCHITECTURE OF DSP PROCESSOR (TMS320C5X): Introduction, Bus structure, Central Arithmetic Logic Unit(CALU),Auxiliary Register ALU (ARAU),Index Register(INDX),Auxiliary Register Compare Register(ARCR),Block Move Address Register(BMAR)Block Repeat Registers(RPTC,BRCR, PASR,PAER), Parallel Logic Unit(PLU),Memory- Mapped Registers, Program Controller, Some flags in the status registers

UNIT II:

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 III:

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 IV:

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 V:

IMPLEMENTATIONS OF BASIC DSP ALGORITHMS: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters,

Implementation of FFT algorithms: An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

UNIT VI:

INTERFACING &APPLICATIONS OF PROGRAMMABLE DSP DEVICES: DSP based Biotelemetry receiver, A speech processing system, An Image processing system, Memory interfacing, Synchronous serial interface, MCBSP, A CODEC interface circuit.

TEXT BOOKS:

1. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004.
2. Digital Signal Processors, Architecture, Programming and Applications – B. Venkata Ramani and M. Bhaskar, TMH, 2004.

REFERENCES:

1. Digital Signal Processing – Jonathan Stein, John Wiley, 2005.
2. DSP Processor Fundamentals, Architectures & Features – Lapsley et al. S. Chand & Co, 2000.

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(A0435128) MIXED SIGNAL DESIGN

(ELECTIVE-III)

OBJECTIVES:

- To study and design various Active filters and Digital filters.
- To study and design analog and mixed signals through HDL .

OUTCOMES:

- Student can design various Active filters and Digital filters.
- Student can design analog and mixed signals through VHDL and VERILOG.

UNIT I

ACTIVE FILTERS: Active RC Filters for Monolithic Filter Design: First and Second Order Filter Realizations, Universal Active Filter (KHN),Self-Tuned Filter, Programmable Filters.

UNIT II

SWITCHED CAPACITOR FILTERS: Switched Capacitor Resisters, Amplifiers, Comparators, Sample and Hold Circuits, Integrator Biquad.

CONTINUOUS TIME FILTERS: Introduction to G_m, C filters, Bipolar Trans conductors, CMOS Trans conductors using Triode Transistors, Active Transistors, Bi-CMOS Trans conductors, MOSFET C Filters, Tuning Circuitry, Dynamic Range Performance.

UNIT III

DIGITAL FILTERS: Sampling, Decimation, Interpolation, Implementation of FIR and IIR Filters.

UNIT IV

SIGMA DELTA CONVERTERS: Over Sampled Converters, Over Sampling without Noise and With Noise, Implementation Imperfections, First Order Modulators, Decimal Filters, Second Order Filters, Sigma Delta DAC and ADCs.

UNIT V

ANALOG AND MIXED SIGNAL EXTENSIONS TO VERILOG: Introduction, Equation Construction, Solution, Waveform Filter Functions, Simulator, Control Analysis, Multi-Disciplinary Model.

UNIT VI

ANALOG AND MIXED SIGNAL EXTENSIONS TO VHDL: Introduction, Language Design Objectives, Theory of Differential Algebraic Equations, The 1076.1 Language, Tolerance Groups, Conservative Systems, Time and Simulation Cycle, A/D and D/A Interaction, Quiescent Point, Frequency Domain Modelling and Examples.

TEXT BOOKS:

1. David A. Johns, Ken Martin, “Analog Integrated Circuit Design”, John Wiley and Sons.
2. Benhard Razavi , “Data Converters”, Kluwer Publishers, 1999.
3. T Sividis Y.P, “Mixed Analog and Digital VLSI Devices and Technology,” McGraw Hill, 1996.

REFERENCES:

1. Antoniou, “Digital Filters Analysis and Design” Tata McGraw Hill,1998.
2. Phillip Allen and Douglas Holm Berg, “CMOS Analog Circuit Design,” Oxford University Press, 2000.

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(A0436128) WIRELESS COMMUNICATIONS AND NETWORKS

(ELECTIVE-IV)

OBJECTIVES:

- To emphasize the core principles of wireless communication systems.
- To make the students to analyse the networking in wireless communication.
- To make the student aware of the latest trends in wireless communications.
- To support student to solve the technical challenges in wireless communications and networks.

OUTCOMES:

- With the knowledge acquired the student can analyse various networking in wireless communication .
- Acquires knowledge in the latest trends of wireless communications.
- Able to come out with the problem statement and solve the challenges in the system.

UNIT-I

OVERVIEW OF WIRELESS COMMUNICATIONS: History of Wireless Communications, Wireless vision, Technical issues, Current wireless systems-cellular telephone systems, cordless phones, wireless LANs, Wide area wireless data services, satellite networks, Zigbee, Bluetooth, ultra band radios.

UNIT II

MOBILE RADIO PROPAGATION: Large-Scale Path Loss, Introduction to Radio Wave Propagation, Free Space Propagation Model, Propagation Mechanisms, Reflection, Ground Reflection (Two-Ray) Model, Diffraction, Scattering.

UNIT III

DIVERSITY TECHNIQUES: Concept of diversity branches and signal paths- Combining methods- Selective diversity combining - Switched combining- maximal ratio combining- Equal gain combining

UNIT IV

WIRELESS LAN TECHNOLOGY: Infrared LANs, spread spectrum LANs, Narrow band Microwave LANs, IEEE 802 protocol Architecture, IEEE 802 architecture and services,802.11 medium access control,802.11 physical layer.

UNIT V

MOBILE DATA NETWORKS: Introduction, Data oriented CDPD network, GPRS and Higher data rates, SMS in GSM, Mobile Application Protocol, Bluetooth.

UNIT VI

MULTIPLE ACESS: TDMA, FDMA, CDMA, CDMA and spread spectrum , Multi carrier modulation, OFDM, Discrete implementation of OFDM..

TEXT BOOKS:

1) Wireless Communications by Andrea Goldsmith, Cambridge University press.
2) Wireless Communication, principles & practice" by T.S. Rappaport, PHI, 2001.
3) Wireless Communication and Networking by William Stalling, PHI, 2003.

REFERENCES:

1) Wireless Digital Communications-Kamilo Feher,PHI,1999.
2) Wireless Communication-Andrews F.Molisch,Wiley India,2006.
3) Principles of Wireless Networks-Kaveh Pah Lahen and P.Krishna Murtht, Pearson Education,2002

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(A0437128) FPGA ARCHITECTURE & APPLICATIONS

(ELECTIVE-IV)

OBJECTIVES:

- To learn the design and operation of various PLDs
- To understand the architecture and types of FPGA.
- To understand the design of FSM and realization of SM charts.
- To design various adders and multipliers.

OUTCOMES:

- Able to learn the design and operation of various PLDs.
- Able to understand the architecture and types of FPGA.
- Able to understand the design of FSM and realization of SM charts.
- Able to design various adders and multipliers

UNIT I

PROGRAMMABLE LOGIC DEVICES: ROM,PLA,PAL,PLD,FPGA, ALTERA CPLD's and Altera Flex 10K series, CPLD.

UNIT II

FPGA: Xilinx logic cell array, CLB,I/O Block, Programmable interconnect, Technology mapping for FPGA: Library based, LUT based, MUX based technology mapping.

UNIT III

TYPES OF FPGA: Programmable Technology, Xilinx XC 3000,XC4000,Actel FPGA's, Altera FPGA's, AMD FPGA, Quick logic FPGA, Algotronix FPGA,FPGA Design flow.

UNIT IV

FSM: Finite State Machine, State Transition Table, State assignments for FPGA's, Problem of the initial state assignment for one hot encoding.

UNIT V

REALIZATION OF SM: Derivation of SM charts, Realization of SM charts, Alternative realization of SM charts using microprogramming, Linked state machine, one hot state machine, Petri-nets for SM: Basic concepts, properties.

UNIT VI

CASE STUDIES: Case studies of parallel adder cell, Parallel Adder, Sequential Circuits, Decade Counters, Parallel Multiplier, Parallel Counters.

TEXT BOOKS:

1. Fundamentals of logic Design,5/e Charles H Roth. Jr
2. P.K. Chan & S. Mourad, Digital Design Using Field Programmable Gate Array, Prentice Hall(Pte),1994.
3. S. Brown, R. Francis, J. Rose, Z. Vransic Field Programmable Gate Array, Kluwer Pubin 1992.
4. J Old Field, R.Dorf, Field Programmable Gate Arrays, John Wiley & Sons, Newyork,1995.

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(A0440128) NANO ELECTRONICS

(ELECTIVE-IV)

OBJECTIVES

- To have broader aspects in understanding the role of molecular electronics, and its application.
- To understand the basic concepts involve in this technology for device architecture and interface engineering at atomic scales.

OUTCOMES

- Student can able to apply the basic concepts involve in this technology for device architecture and interface engineering at atomic scales.
- Student can able to work on nano electronic architectures and devices for their specific applications.

UNIT I: MOLECULAR ELECTRONICS COMPONENTS

Electronic transport in 1, 2 and 3 dimensions – Quantum confinement - Energy subbands –Quantum wells – Quantumwires – Quantum dots – Device miniaturization.

UNIT II: NANO DEVICES-I

Nanoelectronic and Nanocomputers – Quantum Mechanical Tunnel Devices – Characterization of switches – Complex molecular devices – Organic/inorganic based rectifying diode switches – LEDs,

UNIT III: NANO DEVICES-II

TFTs – Single Electron Devices – Consequences of Moore's law.

UNIT IV: NANOELECTRONIC ARCHITECTURES-I

Nanofabrication – Nano patterning of Metallic/Semiconducting nanostructures (e-beam/X-ray, Optical lithography,
STM/AFM- SEM &Soft-lithography).

UNIT V: NANOELECTRONIC MATERIAL AND PROPERTIES: Nanophase materials – Self-assembled Inorganic/Organic layers – Molecular devices – Logic switches – Interface engineering – Properties (Self-organization, Size-dependent) – Limitations.

UNIT VI: COMPUTATIONAL NANOTECHNOLOGY

Monte Carlo Simulations- Computational methods and Simulations from ab initio to multiscale Modeling- Modeling of Nano devices- Applications and Example Problems

TEXT BOOK

1. Edward L. Wolf (2nd Ed.), Nanophysics &Nanotechnology: An Introduction to Modern Concepts in Nano science, WILEY-VCH, 2006, ISBN: 3-527-40651, NT – 09-10 – SRM 50 M – E&T

REFERENCE BOOKS

1. Goser et al, "Nano electronics & Nano systems: From Transistor to Molecular & Quantum Devices".
2. Supriyo Datta, "From Atom to Transistor".
3. John H. Davies, The Physics of Low Dimensional Semiconductors: An Introduction", Cambridge University Press, 1998.
4. Hari Singh Nalwa, "Encyclopedia of Nanotechnology".
5. A. Balandin and K. L. Wang, "Handbook of Semiconductor Nanostructures & Nano devices".
6. Cao Guozhong, "Nanostructures & Nano materials - Synthesis, Properties & Applications".

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(A0438128) MICROWIND & LAB VIEW

(Skill Development Course)

OBJECTIVES:

- To understand the Technology and features of microwind.
- To learn the simulation and performance estimations at circuit level
- To learn the basics of labview.

OUTCOMES:

- Students understands the Technology and features of microwind.
- Students understands the simulation and performance estimations at circuit level
- Students learn the basics of labview.

UNIT I

INTRODUCTION & FEATURES OF MICROWIND: Nanometer Era, Technology scaling, Microwind design flow, DSCH, Nanoloamda, Virtuoso fab, Prothumb-transient analysis of voltage, current, transfer curve, eye diagram, parametric analysis, simulation on layout, Protutor, MEMsim, SOI, Design trends, Extractions, technology rule files.

UNIT II

SIMULATION AND PERFORMANCE ESTIMATIONS AT CIRCUIT LEVEL: Basic CMOS inverter-simulation, layout, power, delay, area and metrics calculations, Simulations of basic gates- and, or, xor, nand, 8 to 1 multiplexor, arithmetic circuits-full adder, 4-bit, 8-bit, 16-bit adders, comparator and sequential circuits – basic latch, RS latch, D latch at layout level.

UNIT III

STUDY OF DIFFERENT PARAMETER VARIATIONS AT CIRCUIT LEVEL: Study of variations of W/L ratio, threshold variations, Process, Voltage and temperature variations on the values of on current, off current, power dissipation, propagation delay and metrics of basic circuits.

UNIT IV

BASICS OF LABVIEW: Introduction, Components of LabVIEW, Owned and free labels, Tools and other pallets, Arranging Objects, Pop-Up menus, color coding, code debugging, context help.

UNIT V

IMPLEMENTING A VI: Front panel design, LabVIEW data types, For loop, while loop, timing a VI, case structures, iterative data transfer. Relating Data Arrays, Clusters, type definitions.

UNIT VI

DATA ACQUISITION: Introduction, classification of signals, guidelines, practical Vs Ideal interfacing, Measurement and Automation explorer, Use of Simple VI's, Use of DAQmx.

TEXT BOOKS:

1. Microwind lab user manual.
2. Sanjay Gupta & Joseph John, Virtual Instrumentation Using LabVIEW, TMH, New Delhi.
3. Jovitha Jerome, Virtual Instrumentation Using LabVIEW, PHI, New Delhi.
4. Gary Johnson, Richard Jennings, LabVIEW graphical programming, McGraw-Hill