ACADEMIC REGULATIONS
B.Tech. Regular Four Year Degree Programme

(For the batches admitted from the academic year 2013-14)
and
B.Tech. Lateral Entry Scheme
(For the batches admitted from the academic year 2014-15)

The following rules and regulations will be applicable for the batches of 4 year B.Tech. degree admitted from the academic year 2013-14 onwards.

1. ADMISSION:

1.1 Admission into first year of Four Year B.Tech. Degree programme of study in Engineering:

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh, admissions are made into the first year of four year B.Tech Degree programme as per the following pattern.

a) Category-A seats will be filled by the Convener, EAMCET.

b) Category-B seats will be filled by the Management as per the norms stipulated by Govt. of Andhra Pradesh.

1.2 Admission into the Second Year of Four year B.Tech. Degree programme (lateral entry):

As per the existing stipulations of A.P State Council of Higher Education (APSCHE), Government of Andhra Pradesh.

2. PROGRAMMES OF STUDY OFFERED BY AITS LEADING TO THE AWARD OF B.TECH DEGREE:

Following are the four year undergraduate Degree Programmes of study offered in various disciplines at Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) leading to the award of B.Tech (Bachelor of Technology) Degree:

1. B.Tech (Computer Science & Engineering)
2. B.Tech (Electrical & Electronics Engineering)
3. B.Tech (Electronics & Communication Engineering)
4. B.Tech (Information Technology)
5. B.Tech (Mechanical Engineering)
6. B.Tech (Civil Engineering)

And any other programme as approved by the concerned authorities from time to time.

3. ACADEMIC YEAR:

The institute shall follow Year-wise pattern for First year course and Semester pattern for II, III and IV years. An academic year shall consist of a first semester and a second semester from second year onwards.

The first year of four year B.Tech programme shall have duration to accommodate a minimum of 180 instruction days. From second year onwards each semester shall have a minimum of 90 instruction days.

4. COURSE STRUCTURE:

Each programme of study shall consist of:

4.1 General Courses comprising of the following: (5 to 10%)

i. Language / Communication Skills
ii. Humanities and Social Sciences: Environmental Science
iii. Economics and Accounting
iv. Principles of Management

4.2 Basic Science Courses comprising of the following: (15 to 25%)

i. Computer Literacy with Numerical Analysis
ii. Mathematics
iii. Physics
iv. Chemistry

4.3 Basic Engineering Courses comprising of the following (depending on the branch): (15 to 25%)

i. Engineering Drawing
ii. Engineering and IT Workshop
iii. Engineering Mechanics
iv. Basic Mechanical Engineering
v. Electrical and Electronics Engineering
vi. Basic civil Engineering
vii. Computer Programming

4.4 Compulsory Discipline Courses: (45 to 55%)

The lists of professional subjects are chosen as per the suggestions of the experts, to impart broad based knowledge needed in the concerned branch of study.

4.5 Elective Courses: (10 to 15%)

Electives will be offered to the students to diversify the spectrum of knowledge, based on the interest of the student to broaden his individual skill and knowledge.

4.6 In the final year first semester subject like comprehensive Electronics and Communication Engineering, with 2 hours / week is to be introduced.

4.7 Every programme of study shall be designed to have 42-44 theory courses and 19-22 laboratory/seminar/comprehensive courses.

4.8 Contact Hours: Depending on the complexity and volume of the course, the number of contact hours per week will be assigned.

5. CREDIT SYSTEM:

Credits are assigned based on the following norms.

	Year Pattern		Semester Pattern	
	Period(s)/ Week	Credits	Period(s)/ Week	Credit(s)
Theory	01	02	01	01
Practical	03	04	03	02
Comprehensive Electronics and Communication Engineering	--	--	02	02
Seminar	--	--	01	01
Final Year Project	--	-	12	12

6. **EXAMINATION SYSTEM:** All components in any programme of study will be evaluated continuously through internal evaluation and an external evaluation component conducted as year-end/semester-end examination.

6.1 Distribution of Marks:

<table>
<tr><th>S. No</th><th></th><th>Marks</th><th colspan="2">Examination and Evaluation</th><th>Scheme of Evaluation</th></tr>
<tr><td rowspan="2">1.</td><td rowspan="2">Theory</td><td>70</td><td colspan="2">Year-end / Semester-end examination.</td><td>The question paper shall be of descriptive type with 8 questions out of which 5 are to be answered in 3 hours duration of the examination.</td></tr>
<tr><td>30</td><td colspan="2">Mid - Examination of 120 Min. duration - Internal evaluation-20 marks. 5 questions - 1st question compulsory – having short answer questions, 4 descriptive out of which 3 are to be answered.

Remaining 10 marks for Assignments, 3-5 in number will be given and each assignment will be evaluated for 10 marks and average considered.</td><td>For I B Tech: Three (03) mid exams, each for 20 marks are to be conducted. Average of best two performances to be considered.
Mid-I: After first spell of instructions (II Units).
Mid-II: After second spell of instructions (III to V Units)
Mid-III: After third spell of instructions (VI to VIII Units)
For a Semester: Two mid-exams, 20 marks each, are to be conducted. Better one to be considered.
Mid-I: After first spell of instructions (IV Units).
Mid-II: After second spell of instructions (V to VIII Units).</td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">Laboratory, Design and / or drawing</td><td>70</td><td colspan="2">Year-end / Semester-end Lab Examination.</td><td>For laboratory courses:
3 hours duration – two examiners. For drawing and/ or Design: like for the theory examination.</td></tr>
<tr><td rowspan="2">30</td><td>20</td><td>Day to Day evaluation.</td><td>Performance in laboratory experiments.</td></tr>
<tr><td>10</td><td>Internal evaluation.</td><td>Practical Tests (For first year average of best two out of three tests and for semester better one out of two tests)</td></tr>
</table>

S. No		Marks	Examination and Evaluation		Scheme of Evaluation
3	Soft Skills – I and II	70	External Evaluation		The question paper shall be of objective type with 100 questions to be answered in 3 hours duration.
		30	20	Day to Day evaluation.	Performance in tests conducted at the end of every topic.
			10	Internal Evaluation.	Two mid-exams, 10 marks each, are to be conducted. Better one to be considered.
4	Seminar	100	Internal Evaluation: 20 Marks for Report. 20 Marks for subject content. 40 Marks for presentation. 20 Marks for Question and Answers.		Continuous evaluation during a semester by the Departmental Committee (DC).
5	Comprehensive Electronics and Communication Engineering	100	The marks can be allotted based on the performance in viva-voce conducted by Head of the department and two senior faculty members in the department.		
6	Project Work	100	70	External evaluation	Semester-end Project Viva-Voce Examination by Committee as detailed under 6.2
			30	Internal evaluation	Continuous evaluation by the DC 15 Marks by DC as detailed under 6.2.1 15 Marks by Supervisor.

6.2 Project Work Evaluation:

6.2.1 The Internal Evaluation shall be made by the Departmental Committee, on the basis of average of two seminars presented by each student on the topic of his project. The presentations shall be evaluated by the Departmental Committee (DC) consisting of Head of the Department, supervisor and a senior faculty member.

6.2.2 The Semester-End Examination (viva-voce) shall be conducted by a Committee consisting of External examiner nominated by the Chief Controller of Examinations, HOD and Supervisor. The evaluation of project work shall be conducted at the end of the IV year.

6.3. Eligibility to appear for the year-end / Semester-End examination:

6.3.1 A student shall be eligible to appear for end examinations if he acquires a minimum of 75% of attendance in aggregate of all the subjects in the year/ semester.

6.3.2 Condonation of shortage of attendance in aggregate up to 10% (65% and above and below 75%) in first year or each semester may be granted by the Institute Academic Committee, if the reason for shortage is convincing.

6.3.3 Shortage of Attendance below 65% in aggregate shall in no case be condoned.

6.3.4 A stipulated fee shall be payable towards condonation of shortage of attendance to the Institute.

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

6.3.6 A student will not be promoted to the next semester unless he satisfies the attendance requirements of the current year/semester, as applicable.

6.3.7 A student detained due to shortage of attendance, will have to repeat that year/semester when offered next.

6.4 Revaluation / Recounting:

Students shall be permitted to request for recounting/ revaluation of the end theory examination answer scripts within a stipulated period after payment of prescribed fee.

After recounting or revaluation, records are updated with changes if any and the student will be issued a revised memorandum of marks. If there are no changes, the student shall be intimated the same through a letter or a notice.

6.5 Supplementary Examination:

All Regular examinations are understood as Regular/Supplementary examinations. The supplementary students have to appear for the supplementary examinations along with their regular examinations conducted at the end of each semester. However, separate supplementary examinations will be conducted for the II-Semester subjects at the end of I-Semester and vice-versa. For seminar, a seminar will be given by the supplementary candidate as per the separate schedule given by the exam section.

7. ACADEMIC REQUIREMENTS FOR PROMOTION/ COMPLETION OF REGULAR B.TECH PROGRAMME OF STUDY:

The following academic requirements have to be satisfied in addition to the attendance requirements for promotion/ completion of regular B.Tech Programme of study.

7.1 For students admitted into B.Tech. (Regular) programme:

7.1.1 A student shall be deemed to have satisfied the minimum academic requirements for each theory, practical, design, drawing subject or project if he secures not less than 35%of marks in the End examination and a minimum of 40% of marks in the sum total of the internal evaluation and End examination taken together. For the seminar he should secure a minimum of 40% marks.

7.1.2 For promotion from I B.Tech to II B.Tech a student must satisfy the attendance requirements in I year.

7.1.3 A Student shall be promoted from II year to III year, if he fulfills the academic requirements of securing a minimum of 56 credits from I year, II year I-Semester and II year II-Semester examinations conducted till that time.

7.1.4 A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of 86 credits from I year, II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.

7.1.5 **A student shall register for all the subjects and earn all the 236 credits**. Marks obtained in all the credits shall be considered for the calculation of the class based on CCPA.

7.1.6 A student who fails to earn all the 236 credits as indicated in the course structure within **eight** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

7.2 For Lateral Entry Students (batches admitted from 2014-2015):

7.2.1 Academic requirements for pass in a subject are the same as in 7.1.1 and attendance requirements as in 6.3.

7.2.2 A student shall be promoted from II year to III year if he fulfills the academic requirements of securing a minimum of 28 credits from II year I and II-Semesters examinations conducted till that time.

7.2.3 A student shall be promoted from III year to IV year if he fulfills the academic requirements of securing a minimum of 58 credits from II year I and II-Semesters and the III year I and II-Semester examinations conducted till that time.

7.2.4 A student shall register for all the subjects and earn all such credits. Marks obtained in all such credits shall be considered for the calculation of the class based on CCPA.

7.2.5 A student who fails to earn all the 180 credits as indicated in the course structure within **six** academic years from the year of his admission shall forfeit his seat in B.Tech. Programme and his admission stands cancelled.

8. TRANSITORY REGULATIONS:

Students who got detained for want of attendance (or) who have not fulfilled academic requirements (or) who have failed after having undergone the course in earlier regulations (or) have discontinued and wish to continue the course are eligible for admission into the unfinished semester/year from the date of commencement of class work for the next batch or later batches with the same (or) equivalent subjects as and when subjects are offered and they continue to be in the academic regulations of the batch he is joining later.

9. CREDIT POINT AVERAGE (CPA) AND CUMULATIVE CREDIT POINT AVERAGE (CCPA):

9.1 For a semester/year:

$$CPA = \frac{1}{10}\frac{\sum_i (C_i M_i)}{(\sum_i C_{ri})}$$

C_i– Credits obtained in the Course i.
M_i–Marks obtained in the Course i.
C_i–Credits registered for Course i.

9.2 For the entire programme:

$$CCPA = \frac{1}{10}\frac{\sum_n \left(\sum_i (C_{ni} M_{ni}) \right)}{\sum_n \left(\sum_i C_{rni} \right)}$$

n- Semester/Year number
C_{ni}– Credits obtained in the Course i of semester/year n.
M_{ni}–Marks obtained in the Course i.of semester/year n.
C_{rni}– Credits registered for Course i of semester/year n.

9.3 Overall Performance:

CCPA	Classification of final result
7.0 and above	First Class with distinction
6.0 and above but below 7.0	First class
5.0 and above but below 6.0	Second class
4.0 and above but below 5.0	Pass class

10. TRANSCRIPTS:

After successful completion of the entire programme of study, a transcript containing performance of all academic years will be issued as a final record. Duplicate transcripts will also be issued, if required, after payment of requisite fee. Partial

transcript will also be issued up to any point of study to a student on request.

11. ELIGIBILITY:

A student shall be eligible for the award of B.Tech Degree if he fulfills all the following conditions:

(i) Registered and successfully completed all the components prescribed in the programme of study to which he is admitted.

(ii) Successfully acquired all **236 credits** as specified in the curriculum corresponding to the branch of study within the stipulated time.

(iii) No disciplinary action is pending against him.

12. AWARD OF B.TECH DEGREE:

The B.Tech Degree will be conferred and awarded by Jawaharlal Nehru Technological University Anantapur, Anantapur on the recommendations of the Principal of Annamacharya Institute of Technology and Sciences (Autonomous).

13. AMENDMENTS TO REGULATIONS:

The chairman, Academic Council of Annamacharya Institute of Technology and Sciences, Rajampet (Autonomous) reserves the right to revise, amend, or change the Regulations, Scheme of Examinations, and / or Syllabi or any other policy relevant to the needs of the society or industrial requirements etc., without prior notice.

14. GENERAL:

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

15. All legal matters are subjected to Rajampet Jurisdiction only.

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

I Year B.Tech

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GC11	English	2	0	0	4	30	70	100

1GC12	Engineering Physics	2	0	0	4	30	70	100
1GC13	Engineering Chemistry	2	0	0	4	30	70	100
1GC14	Mathematics – I	3	1	0	6	30	70	100
1G311	Electronic Devices and Circuits	3	1	0	6	30	70	100
1G112	C Programming and introduction to Data Structures	3	1	0	6	30	70	100
1G513	Engineering Drawing	1	0	3	6	30	70	100
1G312	Electronic Devices and Circuits Lab	0	0	3	4	30	70	100
1GC16	Engineering Physics and Chemistry Lab	0	0	3	4	30	70	100
1GC17	English Language and Communication Skills Lab	0	0	3	4	30	70	100
1G114	C Programming and Data Structures Lab	0	0	3	4	30	70	100
1G411	Engineering and IT workshop	0	0	3	4	30	70	100
	Total	**16**	**3**	**18**	**56**	**360**	**840**	**1200**

Note: L - Lecture; T-Tutorial; P – Practical; C – Credits.

The students attend the Engineering Physics and Engineering Chemistry lab in alternate week i.e. 3/2 per week. The end exam shall be conducted separately and average of two exams will be recorded by examiners.

** The students attend the Engineering and IT Work Shop in alternate week i.e. 3/2 per week. The end exam shall be conducted separately and average of two exams will be recorded by examiners.

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

II Year B.Tech I Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GC32	Engineering Mathematics	4	0	0	4	30	70	100
1G236	Electrical Circuit Theory	4	1	0	4	30	70	100
1G331	Electronic Circuits	4	1	0	4	30	70	100
1G332	Pulse and Digital Circuits	4	1	0	4	30	70	100
1G333	Random Variables and Random Processes	4	1	0	4	30	70	100
1GC34	Environmental Science	4	0	0	4	30	70	100
1G337	Seminar - I	0	0	2	2	100	00	100
1G335	Electronic Circuits Lab	0	0	3	2	30	70	100
1G336	Pulse and Digital Circuits Lab	0	0	3	2	30	70	100
Total		**24**	**4**	**8**	**30**	**340**	**560**	**900**

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

II Year B.Tech II Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1GC41	Mathematics – III	4	0	0	4	30	70	100
1G341	Signals and Systems	4	1	0	4	30	70	100
1G244	Linear Control Systems	4	1	0	4	30	70	100
1G245	Switching Theory and Logic Design	4	1	0	4	30	70	100
1G342	Electromagnetic Waves and Transmission Lines	4	1	0	4	30	70	100
1G246	Electrical Technology	4	1	0	4	30	70	100
1GC44	Soft Skills – I	2	0	0	2	30	70	100
1G344	Signals and Systems Lab	0	0	3	2	30	70	100
1G249	Electrical Technology Lab	0	0	3	2	30	70	100
Total		**26**	**5**	**6**	**30**	**270**	**630**	**900**

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

III Year B.Tech I Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G351	Analog Communications	4	1	0	4	30	70	100
1G352	Linear IC Applications	4	1	0	4	30	70	100
1G353	Digital IC Applications	4	1	0	4	30	70	100
1G354	Antennas and Wave propagation	4	1	0	4	30	70	100
1G457	Computer System Architecture	4	0	0	4	30	70	100
1GA51	Managerial Economics and Financial Analysis	4	0	0	4	30	70	100
1G359	Seminar - II	0	0	2	2	100	00	100
1G357	IC Applications Lab	0	0	3	2	30	70	100
1GC51	Advanced English Communication Skills Lab	0	0	3	2	30	70	100
	Total	**24**	**4**	**8**	**30**	**340**	**560**	**900**

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

III Year B.Tech II Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G361	VLSI Design	4	1	0	4	30	70	100
1G362	Microwave Engineering	4	1	0	4	30	70	100
1G363	Microprocessors and Interfacing	4	1	0	4	30	70	100
1G364	Digital and Data Communications	4	1	0	4	30	70	100
1G365	Electronic Measurements and Instrumentation	4	1	0	4	30	70	100
1GA62	Management Science	4	0	0	4	30	70	100
1GC62	Soft Skills – II	2	0	0	2	30	70	100
1G367	Analog and Digital Communications Lab	0	0	3	2	30	70	100
1G368	Microprocessors and Interfacing Lab	0	0	3	2	30	70	100
Total		**26**	**5**	**6**	**30**	**270**	**630**	**900**

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

IV Year B.Tech I Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G371	Optical Communication	4	1	0	4	30	70	100
1G478	Computer Networks	4	1	0	4	30	70	100
1G372	Digital Signal Processing	4	1	0	4	30	70	100
1G373	Digital Design Through Verilog HDL	4	1	0	4	30	70	100
1G374	Embedded Systems	4	0	0	4	30	70	100
ELECTIVE - I		4	0	0	4	30	70	100
1G47D	Object Oriented Programming							
1G375	Television Engineering							
1G376	Radar Engineering							
1G377	Nano Electronics							
1G37C	Comprehensive Electronics and Communication Engg	0	0	2	2	100	00	100
1G379	Microwave and Optical Communication Lab	0	0	3	2	30	70	100
1G37A	DSP and Embedded Systems Lab	0	0	3	2	30	70	100
	Total	**24**	**4**	**8**	**30**	**340**	**560**	**900**

Curriculum for the Programmes under Autonomous Scheme	
Regulation	R 2013
Department	Department of Electronics and Communication Engineering
Programme Code & Name	G3, B.Tech. Electronics and Communication Engineering

IV Year B.Tech II Semester

Subject Code	Subject Name	Hours/ Week			C	Maximum marks		
		L	T	P		Internal	External	Total
1G381	Cellular and Mobile Communications	4	0	0	4	30	70	100
1G382	Digital Image Processing	4	0	0	4	30	70	100
ELECTIVE -II		4	0	0	4	30	70	100
1G383	DSP Processors and Architectures							
1G48A	Human Computer Interface							
1G384	Reliability Engineering							
1G48B	Neural Networks and Fuzzy Logic							
ELECTIVE - III		4	0	0	4	30	70	100
1G385	Wireless Communication Networks							
1G386	Satellite Communications							
1G387	Biomedical Instrumentation							
1G48C	Database Management System							
1G38A	Seminar - III	0	0	2	2	100	00	100
1G38B	Project Work	0	0	12	12	30	70	100
Total		**16**	**0**	**14**	**30**	**250**	**350**	**600**

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
(AN AUTONOMOUS INSTITUTION)

B.Tech. I Year

(1GC11)ENGLISH

(Common to all branches)

INTRODUCTION

The sweeping changes in the world have elevated English to the status of a tool of global communication and transformed it into e-English. The syllabus has been drafted to improve the competence of students in communication in general and language skills in particular. The books prescribed serve as students' handbooks.

The teacher should focus on developing LSRW (Listening, Speaking, Reading and Writing) skills of students while using the prescribed text and exercises. The classes should be interactive. The students should be encouraged to participate in the classroom proceedings and also to write short paragraphs and essays. The main aim is to encourage two-way communication in place of one-sided lecture.

The text for non-detailed study is meant for extensive reading by the students. They may be encouraged to read some select topics on their own, which could lead into a classroom discussion. In addition to the exercises from the texts done in the class, the teacher can bring variety by using authentic materials such as newspaper articles, advertisements etc.

OBJECTIVES

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

SYLLABUS

Listening Skills:

Objectives

- To enable students to develop their listening skills so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
- To equip students with necessary training in listening so that they can comprehend the speech of people of different backgrounds and dialects.

Students should be given practice in listening and identifying the sounds of English language and to mark stress, right intonation in connected speech.

- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:

Objectives

- To make students aware of the role of ability to speak fluent English and its contribution to their success.
- To enable students to express themselves fluently and appropriately in social and professional contexts.
- Oral practice
- Describing objects/situations/people
- Role play - Individual/Group activities
- Just A Minute (JAM) Sessions(Using exercises from all units of the prescribed text)

Reading Skills:

Objectives

- To develop an awareness in the students about the significance of silent reading and comprehension.
- To develop the ability to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.
- Skimming the text
- Understanding the gist of an argument
- Identifying the topic sentence
- Inferring lexical and contextual meaning
- Understanding discourse features
- Recognizing coherence/sequencing of sentences

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

Writing Skills:

Objectives

- To develop an awareness in the students the skill to write exact and formal writing
- To equip them with the components of different forms of writing
- Writing sentences
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Note Making
- Formal and informal letter writing
- Editing a passage

TEXTBOOKS:

For Detailed study: **ENJOYING EVERYDAY ENGLISH**, Sangam Books (India) Pvt Ltd Hyderabad, 2009.

For Non-detailed study: **INSPIRING LIVES**, Maruti Publications, Guntur, 2009.

UNIT -I

a) "Heaven's Gate" from **ENJOYING EVERYDAY ENGLISH.**

b) "MokshagundamVisvesaraya" from **INSPIRING LIVES.**

c) Parts of Speech (apart from the Language Work from prescribed text).

UNIT -II

a) "Sir C.V.Raman" from **ENJOYING EVERYDAY ENGLISH.**

b) "Mother Teresa" from **INSPIRING LIVES.**
c) Articles and Prepositions (apart from the Language Work from prescribed text).

UNIT -III

a) "The Connoisseur" from **ENJOYING EVERYDAY ENGLISH.**
b) "Vikram Sarabhai" from **INSPIRING LIVES.**
c) Tenses (apart from the Language Work from prescribed text).

UNIT -IV

a) "The Cuddalore Experience" from **ENJOYING EVERYDAY ENGLISH.**
b) "Sam Pitroda" from **INSPIRING LIVES.**
c) Active and Passive Voice (apart from the Language Work from prescribed text).

UNIT -V

a) Bubbling Well Road from **ENJOYING EVERYDAY ENGLISH.**
b) Vishwanathan Anand from **INSPIRING LIVES.**
c) Transformation of Sentences (apart from the Language Work from prescribed text).

UNIT-VI

a) Odds Against Us from **ENJOYING EVERYDAY ENGLISH.**
b) Charlie Chaplin from **INSPIRING LIVES.**
c) Common Errors in English (apart from the Language Work from prescribed text).

UNIT – VII Exercises on

Reading Comprehension, Note-taking and Note-making, Paragraph Writing, Letter Writing, Precise Writing and Technical Report Writing.

UNIT – VIII Exercises on

Spelling and Punctuation, Synonyms and Antonyms, One-word substitutes, Prefixes and Suffixes, Idioms and Phrases, Words often confused Evaluation.

REFERENCES:

1. Technical Communication, Principles and Practice, Meenakshi Raman and Sangita Sharma, OUP, 2013, 2nd edition.
2. Essential Grammar in Use, (with CD), Raymond Murphy, 3/e, Cambridge University Press, 2009.
3. Basic Communication Skills for Technology, Andrea J Ruthurford, Pearson Education, Asia.

4. English for Technical Communication, Aysha Viswamohan, Tata Mc-Graw Hill.
5. English Grammar and Composition, David Green, McMillan India Ltd.
6. Murphy's English Grammar, Raymond Murphy, CAMBRIDGE.
7. Everyday Dialogues in English by Robert J. Dixson, Prentice-Hall of India Ltd., 2006.
8. Communication Skills for Technical Students, Farhathullah, T.M., Orient Blackswan, 2008.
9. Developing Communication Skills, 2/e. by Krishna Mohan, and MeeraBanerji , Macmillan, 2009.
10. English for Technical Communication, Vol. 1 and 2, by K. R. Lakshmi Narayanan, Sci tech. Publications.
11. Longman Dictionary of Contemporary English with DVD, Pearson Longman.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET

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B.Tech I-Year

(1GC12) ENGINEERING PHYSICS

(Common to all branches)

UNIT I: 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 AND X-RAY DIFFRACTION: Introduction -Space lattice -Basis - Unit cell - Lattice parameter - Bravais lattices - Crystal systems - Structure Simple cubic - Body Centered Cubic - Face Centered Cubic crystals - Miller indices of planes and directions in crystals -Separation between successive (h k l) planes - X-ray diffraction by crystal planes - Bragg's law - Laue and Powder methods.

UNIT III: PRINCIPLES OF QUANTUM MECHANICS: Waves and Particles - de-Broglie's hypothesis - Heisenberg's uncertainty principle -Schroedinger's one dimensional wave equation (Time Independent) - Particle in a one dimensional potential box .

THE ELECTRON THEORY OF METALS & BAND THEORY: Postulates of Classical and Quantum free electron theory-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: SEMICONDUCTORS: Intrinsic and extrinsic semiconductors - Law of mass action - Drift & diffusion - Einstein's relation - Hall effect - Direct & indirect band gap semiconductors - p-n junction - Band diagram of p-n junction diode - Diode Equation-LED, LCD & Photo diode.

UNIT V: MAGNETIC PROPERTIES: 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) - Ferro electricity- $BaTio_3$.

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

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 in Industry, Scientific and Medical fields.

UNIT VII: FIBER OPTICS: Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture - Types of Optical fibers and refractive index profiles - Optical fiber communication systems - Application of optical fibers. **Holography:-** Introduction-construction and reconstruction of hologram-Applications.

UNIT VIII: NANOMATERIALS: Introduction - Basic principles of nano materials - Fabrication of nanomaterials - ball milling -plasma arching - Chemical vapour deposition method - sol-gel methods -properties of nanomaterials - carbon nanotubes - properties and applications of carbon nanotubes -Applications of nanomaterials.

TEXT BOOKS:

1. V. Rajendran and K.Thyagarajan, Engineering Physics, Tata McGraw-Hill Co. Ltd.
2. P.K.Palanisamy, Engineering Physics, Scitech Publications.
3. M.R.Srinivasan, Engineering Physics, New Age Publications.

REFERENCES:

1. Halliday, Resnick and Krane, Physics Volume 2, John Wiley India.
2. S.O. Pillai, Applied physics, New Age International.
3. R. K. Gaur and S.L. Gupta, Engineering Physics, Dhanpat rai publications
4. M. N. Avadhanulu, and P.G. Kshirasagar, Engineering Physics, S. Chand publications.
5. C.Kittel, Solid State Physics, John Wiley India.
6. P.K. Mittal, Engineering Physics, I.K.International.
7. K.K Chattopadhyay and A.N. Banarjee, Introduction to Nanoscience and Nano Technology, Prentice - Hall of India Pvt. Ltd.

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B.Tech I-Year

(1GC13) ENGINEERING CHEMISTRY

(Common to all branches)

UNIT-I: WATER TECHNOLOGY: Sources of water, Hardness of water-Temporary and Permanent hardness. Units. Estimation of hardness by EDTA Method. Analysis of Water - Dissolved Oxygen. Disadvantages of Hard Water. Problems on hardness of water. Methods of Treatment of Water for Domestic Purpose - Disinfection: Chlorination, Ozonisation.

Water For Industrial Purpose - Water for Steam Making, Boiler Troubles - Carry Over (Priming and Foaming), Boiler Corrosion, Scales and Sludge, Caustic Embrittlement. Water Treatment: - Internal Treatment - Colloidal, Phosphate, Calgon, Carbonate, Sodium aluminates Conditioning of Water. External Treatment - Ion- Exchange Process.

UNIT II: ELECTRO CHEMISTRY: Conductance - Equivalent Conductance - Molecular Conductance, Conductometric Titrations - Applications of Conductivity Measurements.
Electrochemical Cells: Measurement of EMF, Standard electrode potential, concentration cells, batteries (Ni-Cd cell). Fuel cell: hydrogen oxygen fuel cell and methanol fuel cell.
Insulators - Definition, Properties and Characteristics of Insulating Materials; Engineering Applications.

UNIT III: SCIENCE OF CORROSION: Definition, Types of corrosion: Dry Corrosion, (Direct Chemical attack), Wet Corrosion, Theories of Corrosion and Mechanism, Electro Chemical Theory of Corrosion. Galvanic Series, Galvanic Corrosion, Concentration Cell Corrosion, Oxygen absorption type. Factors Influencing Corrosion. Control of Corrosion - Cathodic Protection - Sacrificial anode and Impressed Current. Uses of Inhibitors. Electro Plating, and Electro less plating (copper and nickel).

UNIT IV: POLYMERS: Definition & Classification of polymers, Functionality. Types of Polymerization - Addition and Condensation Polymerization. Plastics-Thermoplastics and Thermosetting plastics. Properties and Engineering Uses of the Following: Teflon, Bakelite, Nylon. Rubber - Processing of Natural Rubber and Compounding of rubber. Elastomers - Buna S, Buna-N, Silicone Rubber.

UNIT V: EXPLOSIVES AND PROPELLANTS: Explosives, Classification, precautions during storage, blasting fuses, important explosives. Rocket propellants, classification of propellants.
Lubricants :Principles and function of lubricants - Classification and properties of lubricants - Viscosity, flash and fire points, cloud and pour points, aniline point, Neutralization Number and Mechanical Strength.

UNIT VI: PHASE RULE: Definition, Terms involved in Phase Rule and Phase rule equation. Phase diagrams - one component system (water system), two component system (lead- silver system) Eutectics.

UNIT VII: FUELS AND COMBUSTION: Definition and Classification of fuels. Solid, liquid & gaseous fuels, Characteristics of a good fuel. Metallurgical Coke - Characteristics & Manufacture (Otto-Hoffmann). Petroleum - Refining - Synthetic Petrol. Calorific Value & its determination (Bomb Calorimeter). Combustion: Flue gas analysis by Orsat's apparatus. Combustion calculations.

UNIT VIII: INORGANIC ENGINEERING MATERIALS: CEMENT: composition of Portland cement, analysis, setting and hardening of cement (reactions).
Refractory Materials: Definition, Classification with Examples; Criteria of a Good Refractory Material; Causes for the failure of a Refractory Material.

TEXT BOOKS:

1. K.N.Jayaveera, Dr.G.V.Subba Reddy and Dr.C. Ramachandraiah,Chemistry for Engineers, McGraw Hill Higher Education Hyd., 2009.
2. S.S. Dara, A textbook of Engineering Chemistry S.Chand and Co, New Delhi, 2008.
3. Jain and Jain, Text book of Engineering Chemistry, Dhanpat Rai Publishing Company, 15th edition New Delhi, 2008.

REFERENCE:

1. Dr. K. B. Chandrasekhar, Dr. U.N. Dash, Dr. Sujatha Mishra, Engineering Chemistry, Scitech Publications (India) Pvt. Limited, Hyderabad, 2009.
2. B.Viswanath, M.Aulice Scibioh, Fuel Cells principles and applications, Universities press.
3. C.V. Agarwal, Chemistry of Engineering Materials, Tara Publication, Varanasi, 2008.
4. J C Kuriacose and J. Rajaram, Engineering Chemistry (Vol.l and 2) Tata McGraw-Hill Co, New Delhi, 2004.
5. G.D. Gesser, Applied Chemistry: A Text Book for chemistry for Engineers and Technologists, Springer, 2000.
6. S. Glasstone and David Lewis, Physical Chemistry, Van Nostrand, 1960.

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B.Tech. I Year

(1GC14) MATHEMATICS – I

(Common to all branches)

UNIT I: Differential equations of first order and first degree – Exact, linear and Bernoulli equations. Applications of Newton's law of cooling, law of natural growth and decay, 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}, Sinax, cosax, 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.

UNIT IV: Curve tracing – Cartesian, polar and parametric curves. Applications of integration to lengths, volume and surface area of solids of revolution in Cartesian and polar coordinates.

UNIT V: Multiple integral: –Double integral– Evaluation-Change of Variables and Change of order of integration. Triple integral -Evaluation.

UNIT VI: Laplace transform of standard functions – Inverse transform – First shifting Theorem,–Second shifting theorem – Convolution theorem – Laplace transform of Periodic function.

UNIT VII: Transforms of derivatives and integrals-Application of Laplace transforms to ordinary differential equations of first and second order.

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

TEXT BOOKS:

1. T.K.V. Iyengar, B. Krishna Gandhi and others, A Text Book of Engineering Mathematics, Vol – 1, S. Chand & Company.
2. E. Rukmangadachari, E. Keshava Reddy,A Text Book of Engineering Mathematics-1, PearsonEducation.

REFERENCES:

1. B.V. Ramana, A Text Book of Engineering Mathematics, Tata McGraw Hill.B.S.Grewal, Higher Engineering Mathematics, 40thed, Khanna publishers.

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B.Tech. I Year

(1G311) ELECTRONIC DEVICES AND CIRCUITS

(Common to EEE & ECE)

UNIT I: INTRODUCTION TO SEMICONDUCTORS - Insulators, conductors and semiconductors – Semiconductor Types – Law of Mass Action – Continuity equation – Hall Effect – Fermi level in intrinsic and extrinsic Semiconductors.

UNIT II: SEMICONDUCTOR DIODES - Introduction to Semiconductor Diode – Ideal Diode – Characteristics of PN Junction Diode and Temperature Dependency – Drift and Diffusion Currents – Transition and Diffusion Capacitances – Breakdown mechanisms in semiconductor diodes – Zener diode characteristics.

UNIT III: DIODE APPLICATIONS - Introduction – Load Line Analysis – Rectifier Circuits: Half Wave and Full Wave Rectifiers – General Filter Considerations – Capacitor Filter – RC Filter – Other filter configurations – Zener diode as a Regulator.

UNIT IV: BIPOLAR JUNCTION TRANSISTORS - Transistor Construction – Transistor Operation – BJT Characteristics – Transistor Amplifying Action – Load Line – Operating Point – CB, CE and CC Configurations.

UNIT V: BIASING AND BIAS STABILITY - Introduction – Fixed Bias – Emitter Bias – Voltage Divider Bias – Other Bias Configurations – Bias Stabilization: Need for Stabilization – Stabilization Factors – Thermal Stability and Thermal Runaway – Heat Sinks.

UNIT VI: FIELD EFFECT TRANSISTORS - Construction of JFETs – Transfer Characteristics – FET Biasing: Fixed Bias Configuration – Self Bias Configuration – Voltage Divider Biasing – Construction and Characteristics of MOSFETs – Depletion type MOSFETs – Enhancement type MOSFETs – Biasing in MOSFETs.

UNIT VII: SMALL SIGNAL ANALYSIS OF AMPLIFIERS - Small Signal model of BJT – h-parameter model of BJT – Analysis of CB, CE and CC configurations using h-parameters – simplified hybrid model – miller's theorem – dual of miller's theorem – Small signal model of JFET and MOSFET – Common source and common Drain amplifiers, using FET.

UNIT VIII: OTHER SEMICONDUCTOR DEVICES - Light Emitting Diodes – LCD – Varactor Diodes – Tunnel Diodes – Photo Diodes – Silicon Controlled Rectifier – Diac – Triac – Unijunction Transistor – Phototransistors – Opto-Isolators – Solar Cells.

TEXT BOOKS:

1. "Electronic Devices and Circuit Theory" RoberBoylestad and Louis Nashelsky, 9th Edition, PHI.
2. "Electronic Devices and Circuits" J. Millman and Halkias, 1991 edition, 2008, TMH.
3. "Electronic Devices and Circuits" David A Bell, Fifth Edition 2008, Oxford University Press.

REFERENCES:

1. "Integrated Electronics, Analog and Digital Circuits and Systems" J. Millman and Halkias, TMH.
2. "Micro Electronic Circuits" Sedra and Smith, Oxford University Press.
3. "Electronic Devices and Circuits" G.K. Mithal, Khanna Publishers.
4. "Electronic Devices and Circuits" A.K. Maini, VarshaAgarwal, Wiley India Pvt Ltd.

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B.Tech. I Year

(1G112) C PROGRAMMING AND INTRODUCTION TO DATA STRUCTURES
(Common to CIVIL, EEE, ME & ECE)

UNIT I: OVERVIEW OF COMPUTERS AND PROGRAMMING - Electronic Computers then and Now, Computer Hardware, Computer Software, Algorithm, Flowcharts, Software Development Method, Applying the Software Development Method, Number Systems.

UNIT II: INTRODUCTION TO C LANGUAGE - C Language Elements, Variable Declarations and Data Types, Executable Statements, General Form of a C Program, Expressions, Precedence and Associativity, Expression Evaluation, Operators and Expressions, Type Conversions, Decision Statements - If and Switch Statements, Loop Control Statements - while, for, do-while Statements, Nested for Loops, Other Related Statements -break, continue, goto.

UNIT III: ARRAYS - Declaring and Referencing Arrays, Array Subscripts, Using for Loops for Sequential Access, Using Array Elements as Function Arguments, Arrays Arguments, Multidimensional Arrays.

Functions - Library Functions, Functions with and without Arguments, Communications Among Functions, Scope, Storage Classes - Auto, Register, Static, Extern, Scope rules, Type Qualifiers, Recursion - Recursive Functions, Preprocessor Commands.

UNIT IV: STRINGS - String Basics, String Library Functions, Longer Strings, String Comparison, Character operations, String-To-Number and Number-To- String Conversions,

Pointers - Introduction, Features of Pointers, Pointer Declaration, Arithmetic Operations With Pointers, Pointers and Arrays, Pointers and Two-Dimensional Arrays, Array of Pointers, Pointers to Pointers, Void Pointers, Dynamic Memory Allocation, Programming Applications, Pointer to Functions, Pointers and Strings.

UNIT V: STRUCTURES AND UNIONS – Introduction, Features of Structures. Declaration and Initialization of Structures, Structure within Structure, Array of Structures, Pointer to Structure, Structure and Functions, typedef, Bit Fields, Enumerated Data Type, Union, Union of Structures.

UNIT VI: FILES - Introduction, Streams and File Types, Steps for File Operations, File I/O Structures, Read and Write, Other File function, Searching Errors in Reading/Writing of Files, Low Level Disk I/O, Command Line Arguments, Application of Command Line Arguments, File Status functions (error handling).

UNIT VII: DATA STRUCTURES - Overview of Data Structure, Representation of a Stack, Stack Related Terms, Operation on a Stack, Implementation of a Stack, Representation of Arithmetic Expressions, Infix, Prefix, and Postfix Notations, Evaluation of Postfix Expression, Conversion of Expression from Infix to Postfix, Recursion, Queues - Various Positions of Queue, Representation of Queue, Insertion, Deletion, Searching Operations.

Linked List - Singly Linked List, Linked List with and without header, Insertion, Deletion and Searching Operations.

UNIT VIII: SEARCHING AND SORTING - Exchange (Bubble) Sort, Selection Sort, Quick Sort, Insertion Sort, Merge Sort. Searching- Linear and Binary Search Methods.

TEXT BOOKS:

1. Programming in C and Data Structures, J.R.Hanly, Ashok N. Kamthane and A. Ananda Rao, Pearson Education
2. C and Data Structures, E.Balaguruswamy, Tata Mc Graw Hill
3. C and Data Structures, A snapshot oriented treatise with live engineering examples, Dr. N.B.Venkateswarlu, Dr. E.V.Prasad, S. Chand.

REFERENCES

1. C Programming & Data Structures, B.A.Forouzan and R.F. Gilberg, Third Edition, Cengage Learning.
2. LETUS C, Yeswanth Kanitkar, Ninth Edition, BPB Publication.
3. Data Structures using C – A.M.Tanenbaum, Y.Langsam, and M.J. Augenstein, Pearson Education / PHI, Eighth Edition.

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B.Tech I Year

(1G513) ENGINEERING DRAWING
(Common to EEE, ECE, CSE and IT)

UNIT I: Introduction to engineering drawing – geometrical constructions - construction of ellipse, parabola and hyperbola. (General method and Special methods)

UNIT II: CYCLOIDAL CURVES – Cycloid, Epi-cycloid, Hypo cycloid.

UNIT III: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES – inclined to one reference plane and inclined to both the reference planes.

UNIT IV: ORTHOGRAPHIC PROJECTIONS OF PLANES – inclined to one reference plane and perpendicular to other reference plane and inclined to both the reference planes.

UNIT V: ORTHOGRAPHIC PROJECTIONS OF SOLIDS- Cylinder, cone, prism, pyramid and sphere for different positions and axis inclined to both the reference planes.

UNIT VI: ISOMETRIC PROJECTIONS: Isometric projections of lines, planes and simple solids.

UNIT VII: Conversion of orthographic views into isometric views.

UNIT VIII: Conversion of isometric views into orthographic views.

TEXT BOOKS :

1. Engineering drawings by N.D.Bhatt
2 Engineering graphics by K.L. Narayana & P.Kannayya

REFERENCES:-

1. Engineering drawing and graphics by Venugopal/ New age
2. Engineering drawing by Johle / TMI

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B.Tech. I Year

(1G312)ELECTRONIC DEVICES AND CIRCUITS LAB
(Common to EEE & ECE)

ELECTRONIC WORKSHOP PRACTICE (in 4 lab sessions):

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

- Multimeters (Analog and Digital)
- Function Generator
- Regulated Power Supplies
- CRO.

(For Laboratory examination – Minimum of 14 Experiments)

1. Forward and Reverse Bias Characteristics of PN junction Diode.
2. Zener Diode Characteristics and Zener as Voltage Regulator.
3. Input and Output Characteristics of Transistor CB Characterstics.
4. Input and Output Characteristics of Transistor CE Characterstics.
5. Input and Output Characteristics of Transistor CC Characterstics.
6. Half Wave Rectifier with and without filter.
7. Full Wave (Center trapped) Rectifier with and without filter.
8. Full Wave (Bridge) Rectifier with and without filter.
9. JFET Characteristics.
10. Measurement of h-parameters of BJT in CB, CE and CC configurations.
11. Frequency response of CE Amplifier.
12. Frequency response of CB Amplifier.
13. Frequency response of CC Amplifier.
14. Frequency response of Common Source FET Amplifier.
15. VI Characteristics of LED.
16. Application of LED (7 SEGMENT DISPLAY).
17. SCR Characteristics.
18. UJT Characteristics.

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B.Tech I year

(1G114) C PROGRAMMING AND DATA STRUCTURES LAB
(Common to CIVIL, EEE, ME& ECE)

Objectives:

• To make the student learn a programming language.

• To teach the student to write programs in C to solve the problems.
• To introduce the student to simple linear data structures such as lists, stacks, queues.

Recommended Systems/Software Requirements:

• Intel based desktop PC with ANSI C Compiler and Supporting Editors

Exercise l.

a) Write a C program to calculate Simple Interest by accepting principle amount, rate of interest and time.

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

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

Exercise 2.

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

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

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

Exercise 3.

a) Write a C program to find the given number is Armstrong number or not.
($153 = 1^3 + 5^3 + 3^3$)

b) Write a C program to find the given number is Strong number or not.
(145 = 1!+4!+5!)

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

Exercise 4.

a) Write a C program to calculate the following Sum:

$$Sum = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \frac{x^{10}}{10!}$$

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

For example: if n is 3 and x is 5, then the program computes 1+5+25+125. Print x, n, the sum Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Find if any values of x are also illegal? If so, test for them too.

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

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

Exercise 7.

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

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

Exercise 8.

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 solve Towers of Hanoi problem.

Exercise 9.

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

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

Exercise 10.

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 11.

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

i) Reading a complex number ii) Writing a complex number

iii) Addition of two complex numbers iv) Multiplication of two complex numbers

(Note: represent complex number using a structure.)

Exercise 12

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

b) Write a C program to reverse the first n characters in a file.

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

Exercise 13

a) Write a C programme to display the contents of a file.

b) Write a C programme to merge two files into a third file

(i.e., the contents of the first file followed by those of the second are put in the third file)

Exercise 14

Write a C program that uses functions to perform the following operations on singly linked list.:

i) Creation ii) Insertion iii) Deletion iv) Traversal

Exercise 16

Write C programs that implement stack (its operations) using

i) Arrays ii) Pointers

Exercise 17

Write C programs that implement Queue (its operations) using

i) Arrays ii) Pointers

Exercise 18

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

i) Converting infix expression into postfix expression

ii) Evaluating the postfix expression

Exercise 19

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 20

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

i) Linear search ii) Binary search

Exercise 21

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

Exercise 22

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

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. Rajaraman, PHI Publications.

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B.Tech I Year

(1GC16) **ENGINEERING PHYSICS AND CHEMISTRY LAB**

(Common to all branches)

PART A: ENGINEERING PHYSICS LAB

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

List of Experiments

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 Frequency of AC source by Sonometer.
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 material of p-n junction
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. Melde's experiment - Transverse & Longitudinal modes.

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

TEXT BOOKS:

1. Laboratory manual of ENGINEERING PHYSICS by Dr. Y. Aparna, Dr. K. VenkateswaraRao.
2. Laboratory Engineering Physics by Dr. K. Palanisamy, Scitech Publications.

PART B: ENGINEERING CHEMISTRY LAB

1. Estimation of Hardness of Water by EDTA method.
2. Estimation of Copper by EDTA method.
3. Estimation of Ferrous ion by dichrometry.
4. Estimation of Copper, by Iodometry.
5. Estimation of dissolved oxygen by Winkler’s method.
6. Determination of strength of the given Hydrochloric acid against standard sodium hydroxide solution by Conductometric titration
7. Determination of eutectic composition and temperature of simple eutectic system (Urea-Benzoic acid).

8. Determination of viscosity of the oils through Redwood viscometer I & II
9. Determination of calorific value of fuel using Bomb calorimeter
10. Determination of Iron in Cement by colorimetric method.

TEXT 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:

1. Glass ware: Pipettes, Burettes, Volumetric Flasks, Beakers, Standard flasks, Measuring jars, Boiling Test tubes, reagent bottles, (Borosil)
2. Analytical balance (keroy) (15 Nos)
3. Calorimeter
4. Bomb Calorimeter
5. Redwood viscometer No. 1& No.2
6. Conductometer/ Conductivity bridge
7. Potentiometer
8. Wash bottles, test tube stands, burette stands
9. Gas cylinders with Bunsen burners
10. Chemicals: Hydrochloric acid, sodiumhydroxide, EDTA, EBT indicator, FSB-F indicator, methanol, Mohr's salt, copper sulphate, magnesium sulphate, ammonia, ammonium sulphate, calcium sulphate, etc.,

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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B.Tech I Year

(1GC17) ENGLISH LANGUAGE AND COMMUNICATION SKILLS LAB
(Common to all branches)

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.

Objectives:

- 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 resume preparation, report- 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.

SYLLABUS:

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

1. **Introduction to the Sounds of English- Vowels, Diphthongs & Consonants**
2. **Introduction to Stress and Intonation**
3. **Situational Dialogues and Role-play**
4. **Telephone Skills**
5. **'Just A Minute' (JAM)**
6. **Oral Presentations**
7. **Describing Objects / Situation / People**
8. **Information Transfer**

Minimum Requirement:

The English Language Lab shall have two parts:

- **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.
- **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V. an LCD projector, a digital stereo –audio & video system and camcorder etc.

System Requirement (Hardware component):

Computer network with LAN with minimum 60 multimedia systems with the following specifications:
i) P – IV Processor
a) Speed – 2.8 GHZ
b) RAM – 512 MB Minimum
c) Hard Disk – 80 GB
ii) Headphones of High quality

Manual cum Record, prepared by the Faculty Members of English of the college will be used by Students.

Suggested Software:
Sky Pronunciation Suite
Connected Speech from Clarity
Clarity Pronunciation Power – Part I
The Rosetta Stone English Library
Mastering English in Vocabulary, Grammar, Spellings, Composition
English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge
Dorling Kindersley - Series of Grammar, Punctuation, Composition etc.
Language in Use, Foundation Books Pvt Ltd with CD
Learning to Speak English - 4 CDs
Microsoft Encarta with CD
Cambridge Advanced Learners' English Dictionary with CD.
Murphy's English Grammar, Cambridge with CD

Books Suggested for English Language Lab Library (to be located within the lab in addition to the

CDs of the text book which are loaded on the systems):

- **English Pronouncing Dictionary,** Daniel Jones Current Edition with CD.
- **Spoken English**, R. K. Bansal and J. B. Harrison, Orient Longman 2006 Edn.
- **Speaking English Effectively,** Krishna Mohan & NP Singh (Macmillan).
- **A Practical Course in English Pronunciation**, (with two Audio cassettes) by J. Sethi, Kamlesh.
- Sadanand& D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
- **Body Language- Your Success Mantra ,DrShaliniVerma, S.Chand& Co,** 2008**.**
- **English Dictionary for Advanced Learners,** (with CD) International edn. Macmillan 2009.
- **A Handbook for Englsih language Laboratories,** E.Sureshkumar, P.Sreehari, Foundation Books, 2009.
- **DELTA's key to the Next Generation TOEFL Test,** 6 audio CDS, New Age International Publishers, 2007.

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B.Tech I Year

(1G411) ENGINEERING & I.T. WORKSHOP
(Common to all branches)

ENGINEERING WORKSHOP

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 labour 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.

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): 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 guage G.I. sheet.
d. **House-wiring**– Two jobs (exercises): wiring for ceiling rose and two lamps (bulbs) with independent switch controls with or without looping, wiring for stair case lamp, wiring for a water pump with single phase starter.
e. **Foundry**– Preparation of two moulds (exercises): for a single pattern and a double pattern.
f. **Welding** – Preparation of two welds (exercises): single V butt joint, lap joint, double V butt joint or T fillet joint.

2. TRADES FOR DEMONSTRATION:

a. Plumbing
b. Machine Shop
c. Metal Cutting

Apart from the above the shop rooms should display charts, layouts, figures, circuits, hand tools, hand machines, models of jobs, materials with names such as different woods, wood faults, Plastics, steels, meters, gauges, equipment, CD or DVD displays, First aid, shop safety etc. (though they may not be used for the exercises but they give valuable information to the student). In the class work or in the examination knowledge of all shop practices may be stressed upon rather than skill acquired in making the job.

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, SaravanaPandian, 4/e Vikas.
4. Dictionary of Mechanical Engineering, GHF Nayler, Jaico Publishing House.

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.

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 databases using the Microsoft suite of office tools and LaTeX. (It is recommended to use Microsoft office 2007 in 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.

***Task1:*UsingLaTeX 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.

Task2: **Creating project** abstract features to be covered:-Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

Task3: **Creating a Newsletter:** Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

Task4: **Creating a Feedback form** - Features to be covered- Forms, Text Fields, Inserting objects, Mail Merge in 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

Task2: **Calculating GPA - Features to be covered**:- Cell Referencing, Formulae in excel – average, std.deviation, Charts, Renaming and Inserting worksheets, Hyper linking, Count function, LOOKUP/VLOOKUP

Task3: **Performance Analysis** - Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

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 - Task2: 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

Access

Exercise11 – Task1:Help students in preparing database using Microsoft/ equivalent (FOSS) access tool. Topic covered during this week includes - Access Orientation, Using Templates, Layouts, Inserting data, Editing data, Inserting Tables, Working with menu objects, Renaming, deleting, modifying data and tables.

Internet & World Wide Web

Exercise 12 - 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.

Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers.

Exercise 13 - 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 McGraw 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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II Year B.Tech. ECE-I Semester

(1GC32) ENGINEERING MATHEMATICS
(Common to ECE and EEE)

UNIT I: Matrix algebra -Rank-Echelon form, normal form -solutions of linear system of homogenous and non-homogenous equations- -Gauss elimination method-Eigen values-Eigen vectors-Properties.

UNIT II: Solution of algebraic and Transcendental equations-Bisection method-Method of false position-Newton-Raphson method -Numerical solutions of ordinary differential equations-Taylor's series-Euler's methods–Runge-kutta fourth order method-Milne's predictor-corrector method.(Without proofs)

UNIT III: Curve fitting: Fitting a straight line-second degree parabola-Exponential curve – power curve by the method of least squares-Correlation-rank correlation.

UNIT IV: Partial differential equations:Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions-solutions of linear equation–Charpit's method-Method of separation of variables.

UNIT V: Fourier series: Determination of Fourier coefficients-Fourier series of even and odd functions-Fourier series in an arbitrary interval-half range Fourier sine and cosine expansions.

UNIT VI: Fourier transforms: Fourier sine Transforms-Cosine Transforms-Properties-Inverse Transforms-Finite Fourier Transforms.

UNIT VII: Mean-Median-Mode-Range-Standard deviation-Random variables-Discrete and Continuous Random variables –Distribution functions.

UNIT VIII: Probability distributions-Binomial distribution-Poisson distribution–Uniform distribution(Discrete) -Normal distribution.

TEXT BOOKS:

1. B. S. Grewal, *Higher Engineering Mathematics*, Khanna Publishers, New Delhi, 40th edition.
2. Erwin Kreyszig, *Advanced Engineering Mathematics*, New Age International (Pvt) Limited, 8th edition.

REFERENCE BOOKS:

1. B. V. Ramana, *A text book of Engineering Mathematics*, Tata McGraw Hill.
2. T. K. V. Iyengar, B. Krishna Gandhi and Others, *Mathematical Methods*, S.Chand & Company.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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II Year B.Tech. ECE – I Semester

(1G236) ELECTRICAL CIRCUIT THEORY

UNIT I FUNDAMENTALS OF ELECTRICAL CIRCUITS: Concepts of charge, current, voltage and power, active & passive elements, reference concepts of direction for voltages & currents, voltage and current relationships for passive elements, Ohm's law, Kirchhoff Laws, current division and voltage division rules, network reduction techniques, series, parallel, series-parallel circuits, star-delta and delta-star transformations, source transformation.

UNIT II BASIC NODAL & MESH ANALYSIS: Basic definitions: node, path, loop, branch, nodal analysis and super node concept, mesh analysis and super mesh concept - problems.

UNIT III FUNDAMENTALS OF AC CIRCUITS: Introduction - advantages of AC supply, types of waveforms, importance of sinusoidal waveforms, basic definitions: waveform, cycle, time period, frequency, and amplitude, determination of average and RMS value, form factor & peak factor for different alternating waveforms, phase and phase difference.

UNIT IV SINGLE PHASE AC CIRCUITS: Sinusoidal response of R, L, C and combination of R, L, C circuits, concept of impedance and power triangles, power factor, resonance, bandwidth and quality factor for series and parallel networks, locus diagram.

UNIT V THREE PHASE SYSTEM: Advantages of three phase system over single phase system – Phase sequence - star & delta connections Relationship between phase and line quantities, Balanced and unbalanced circuits, Power measurement in three phase systems using two wattmeter method..

UNIT VI MAGNETICALLY COUPLED CIRCUITS: Coupled circuits, self mutual inductance, DOT conventions, coefficient of coupling, analysis of magnetic circuits: series, parallel and composite, comparison of electrical and magnetic circuits.

UNIT VII NETWORK THEOREMS – I: Thevenin's, Norton's, Maximum power transfer and Superposition theorems for DC and sinusoidal excitations - applications.

UNIT VIII NETWORK THEOREMS–II: Tellegen's, Millman's, Reciprocity, Substitution and Compensation theorems for DC and sinusoidal excitation - applications.

TEXT BOOKS:

1. Sudhakar A & Shyam Mohan, *Electric Circuits*, TMH, 3rd Edition, 2007.
2. Chakrabarthi A, *Circuits Theory*, Dhanpat Rai & Co, New Delhi, 2009.

REFERENCE BOOKS:

1. M.E. Van Valkenberg, *Network Analysis,* Pearson Publications, 3rd Edition, New Delhi 2006.
2. William H.Hayt & Jack E.Kennedy & Steven M. Durbin, *Engineering Circuit Analysis*, 6th Edition, TMH, 2009.

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II Year B.Tech. ECE-I Semester

(1G331) ELECTRONIC CIRCUITS

UNIT I SINGLE-STAGE AMPLIFIERS: Classification of Amplifiers, Distortion in amplifiers, Analysis of CE,CC,CB configurations with Exact model and simplified hybrid

model, Analysis of Common emitter amplifier with emitter resistance, Emitter follower, Miller's Theorem and dual of Miller's theorem.

UNIT II MULTI-STAGE AMPLIFIERS: Analysis of Cascaded Transistor Amplifiers, RC Coupled amplifier, Darlington pair with Boot-strapped emitter follower, Cascode amplifier, Frequency response and analysis of RC Coupled, Direct coupled and Transformer coupled amplifiers.

UNIT III BJT FREQUENCY RESPONSE: General frequency considerations, Low and high frequency response of BJT amplifier , Effect of coupling and Bypass capacitors, Hybrid-π transistor model, CE short circuit current gain, Current gain with resistive load, Gain-Bandwidth product, Emitter follower at High frequencies.

UNIT IV FEEDBACK AMPLIFIERS: Types of amplifiers**,** Feedback concepts, Classification of feedback amplifiers, Transfer Gain with feedback, General characteristics of negative feedback amplifiers-Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components.

UNIT V OSCILLATORS: Condition for oscillations. Oscillator Types, Frequency and amplitude stability of oscillators, generalized analysis of LC oscillators-Hartley and Colpitts oscillators, RC-phase shift and Wien bridge oscillators, Crystal Oscillators-Quartz and Pierce.

UNIT VI LARGE SIGNAL AMPLIFIERS: Class A power Amplifier, Efficiency of Class A power amplifier, Transformer Coupled amplifier, Push-pull amplifier, Complementary Symmetry, Class B power Amplifier, phase inverters, Transistor power dissipation.

UNIT VII TUNED AMPLIFIERS: Introduction, Q-Factor, Small Signal Tuned Amplifiers, Effect of Cascading on Single tuned and double tuned amplifiers Band width, staggered tuned amplifiers, Stability of tuned amplifiers.

UNIT VIII VOLTAGE REGULATORS: Voltage regulation – Line Regulation, Load Regulation, Types of Regulators, Series voltage regulator, shunt regulators, Overload Voltage protection, IC Regulators-78xx/79xx,723.

TEXT BOOKS:

1. J. Millman and C.C. Halkias- *Integrated Electronics*, Mc Graw-Hill, 1972.
2. Robert T. Paynter- *Introductory Electronic Devices and Circuits*, Pearson Education, 7th Edition.

REFERENCE BOOKS:

1. Robert L. Boylestad and Louis Nashelsky, *Electronic Devices and Circuits Theory*, Pearson/Prentice Hall, 9th Edition, 2006.
2. Donald A. Neumann- *Electronic Circuit Analysis and Design*, Mc Graw Hill.

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II Year B.Tech. ECE-I Semester

(1G332) PULSE AND DIGITAL CIRCUITS

UNIT I LINEAR WAVE SHAPING: High-pass, low-pass RC circuits, their response for sinusoidal, step, pulse, square, ramp and exponential inputs. High- pass RC network as differentiator, Low-pass RC network as integrator, attenuators, RL and RLC circuits and their response for step input, Ringing circuit.

UNIT II NON-LINEAR WAVE SHAPING: Diode clippers, Transistor clippers, clipping at two independent levels, Comparators, Diode-differentiator, comparator, applications of voltage comparators, clamping operation, clamping circuit taking source and diode resistance into account, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage.

UNIT III SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, Diode Switching Times, Transistor as a Switch, transistor-switching times, Break down voltages, Transistor in saturation, Temperature variations of saturation parameters.

UNIT IV MULTIVIBRATORS: Bistable Multivibrators – Fixed-Bias Transistor Bistable Multivibrator, Self-Bias Transistor Bistable Multivibrator, Emitter Coupled Bistable Multivibrator, Commutating Capacitors, Symmetrical & UnSymmetrical Triggering of Bistable Multivibrator, Monostable Multivibrators : Collector Coupled Monostable Multivibrator, Emitter Coupled Monostable Multivibrator , Astable Multivibrators : Collector Coupled Astable Multivibrator, Emitter Coupled Astable stable Multivibrator , Schmitt trigger circuit using BJT.

UNIT V TIME-BASE GENERATORS: General features of a time-base signal, methods of generating time-base waveform, Principle and working of Miller and Bootstrap time-base generators, Methods of Linearity improvement.

UNIT VI SAMPLING GATES: Basic operation and principle of Sampling gates, Unidirectional diode sampling gate, Bi-Directional diode & Transistor sampling gates, Four diode sampling gate, Six diode sampling gate, Reduction of pedestal in gate circuits, applications of sampling gates.

UNIT VII SYNCHRONIZATION AND FREQUENCY DIVISION: Pulse Synchronization of relaxation devices, Frequency division in sweep circuit, astable relaxation circuits, Monostable relaxation circuits, stability of relaxation devices, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit, A Sinusoidal divider using regeneration and modulation.

UNIT VIII REALIZATION OF LOGIC GATES AND TYPES OF LOGIC FAMILIES: AND,OR,NOT gates using diodes and transistors, Inhibit operation, NAND & NOR gates using DTL,RTL Logic, DCTL,TTL, and CMOS logic families, comparison of logic families.

TEXT BOOKS:

1. J. Millman and H. Taub, *Pulse, Digital and Switching Waveforms*, McGraw-Hill, second edition, 2007.
2. Anand Kumar, *Pulse and Digital Circuits*, PHI, 2005.Second Edition.

REFERENCE BOOKS:

1. Ronald j.Tocci, *Fundamentals of pulse and digital circuits*, third edition, 2008.
2. David A.Bell, *Solid state pulse circuits*, 4th Edition, 2002 PHI.

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II Year B.Tech. ECE-I Semester

(1G333) RANDOM VARIABLES AND RANDOM PROCESSES

UNIT I PROBABILITY AND RANDOM VARIABLES: Probability introduced through sets and relative frequency, Joint and Conditional Probability, Total Probability, Bayes Theorem, Independent Events, Random Variable Concept, Distribution and Density functions, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, and Conditional Distribution & Conditional Density Functions.

UNIT II OPERATIONS ON ONE RANDOM VARIABLE: Expectation, Moments: moments about the origin, Central Moments, Variance and Skew, Chebychev's Inequality, Functions that give moments.

UNIT III MULTIPLE RANDOM VARIABLES: Vector Random Variables, Joint Distribution Function and its Properties, Joint Density and its properties, Conditional Distribution and Density, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, Expected Value of a Function of Random Variables, Joint Characteristic Functions, Jointly Gaussian Random Variables.

UNIT IV LINEAR SYSTEMS: Linear System Fundamentals, Random Signal Response of Linear Systems, Spectral Characteristics of System Response: Power Density Spectrum of Response, Cross-Power Density Spectrums of Input and Output.

UNIT V NOISE: Noise Bandwidth, Band pass, Band-Limited and Narrowband Processes, Properties, Modeling of Noise Sources: Resistive Noise Source, Arbitrary Noise sources, Effective Noise temperature.

UNIT VI RANDOM PROCESSES – TEMPORAL CHARACTERISTICS: The Random Process Concept, Stationarity and independence: Distribution and Density Functions, 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.

UNIT VII RANDOM PROCESSES–CORRELATION FUNCTIONS: Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions, Discrete-Time processes and sequences, Gaussian Random processes, Poisson random process.

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

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Henry Stark and John W. Woods, *Probability and Random Processes with Application to Signal Processing* –Pearson Education, 3rd Edition.
2. George R. Cooper, Clave D. MC Gillem, *Probability Methods of Signal and System Analysis*. Oxford, 3rd Edition, 1999.

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II Year B.Tech. ECE-I Semester

(1GC34) ENVIRONMENTAL SCIENCE
(Common to ECE & IT)

UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES:
Definition, multidisciplinary nature, Scope &Importance- Need for public awareness -Global environmental crisis-People in Environment –Institutions in Environment.

UNIT II FOREST, WATER AND ENERGY RESOURCES:
Natural resources: definition .Renewable &non-renewable natural resources. Natural resources & their associated problems.
Forest resources: Use & over –exploitation- deforestation , case studies- Timber extraction – Mining-dams & their effects on forest & tribal people. **Water resources:** Use and over utilization of surface and ground water -floods, drought- conflicts over water, dams – benefits & problems.
Energy resources: Growing energy needs- renewable and non – renewable energy resources- use of alternate energy resources, case studies.

UNIT III MINERAL, FOOD & LAND RESOURCES:
Mineral resources: Use and exploitation, environmental effects of extracting & using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and over grazing, effects of modern agriculture, fertilizer – pesticide problems, water – logging, salinity, case studies.
Land resources: Land as a resource, land degradation, man – induced landslides, soil erosion and desertification.

- Role of an individual in the conservation of natural resources.
- Equitable use of resources for sustainable life styles.

UNIT IV ENVIRONMENTAL POLLUTION:
Definition, causes, effects & control measures of: Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Marine pollution, Nuclear hazards - Pollution case studies- Role of an individual in prevention of pollution.
Solid waste management: Causes, effects and control measures of urban and industrial wastes -Disaster management: floods, drought, earthquake, cyclone and landslides.

UNIT V ECOSYSTEMS: Concept of an ecosystem. Structure and functions of an ecosystem-Producers, consumers & decomposers - Food chains, food webs & ecological pyramids - Energy flow in the ecosystem - Cycling of nutrients (Bio geo chemical cycles) - Energy production - Ecosystem development & regulation -Ecological succession. Introduction, types, characteristic features, structure and functions of the following ecosystem: (a) Forest ecosystem (b) Grass land ecosystem (c) Desert ecosystem (d) Aquatic ecosystem (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT VI BIODIVERSITY & ITS CONSERVATION: Introduction, Definition: genetic, species and ecosystem diversity.
Value of Biodiversity: consumptive value, productive value, social value, ethical value, aesthetic value & option values - Bio-geographical classification of India - Biodiversity at global, national and local levels - India as a mega – diversity nation- Hot spots of biodiversity.
Threats To Biodiversity: habitat loss, poaching of wild life, man-wild life conflicts - Endangered and endemic species of India- Conservation of biodiversity: In –situ & Ex-situ conservation

UNIT VII SOCIAL ISSUES & THE ENVIRONMENT: From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people; its problems & concerns, case studies.
Environmental Ethics: Issues & possible solutions-Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents & holocaust, case studies - Wasteland reclamation - Consumerism & waste products - Environment protection Act - Air (Prevention & Control of Pollution) Act.-Water (Prevention & Control of Pollution) Act.-Wildlife Protection Act-Forest Conservation Act-Issues involved in enforcement of environmental legislation-Public awareness.

UNIT VIII HUMAN POPULATION & ENVIRONMENT: Population growth, variation among nations. Population explosion – Family Welfare Program - Environment & human health-Human Rights-Value Education - HIV/AIDS-Women & Child Welfare-Role of Information Technology in Environment and human health-Case studies.

TEXTBOOKS:

1. Erach Bharucha, *Text book of Environmental Studies for Undergraduate Courses* for University Grants Commission, University press.
2. R. Rajagopalan, *Environmental Studies* Oxford University Press.
3. Anubha Kaushik and C. P. Kaushik, *Perspectives In Environmental Studies*. New Age International Publishers.

REFERENCE BOOKS:

1. J. P. Sharma, *Comprehensive Environmental Studies.* Laxmi Publications.
2. Anindita Basak, *Environmental Studies*. Pearson education.
3. Benny Joseph, *Environmental Studies*. Mc. Graw Hill Publications.

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II Year B.Tech. ECE-I Semester

(1G335) ELECTRONIC CIRCUITS LAB

List of Experiments (Twelve experiments to be done):

I) Design and Simulation in Simulation Laboratory using Multisim OR Pspice OR Equivalent Simulation Software. (Any Six):

1. Common Emitter amplifier
2. Common Source FET amplifier
3. Two Stage RC-Coupled Amplifier
4. RC Phase Shift Oscillator
5. Class A Power Amplifier (Transformer less)
6 .Wien Bridge Oscillator
7. Feedback amplifier (Current Series& Voltage Series)

II) Testing in the Hardware Laboratory (Six Experiments: 3 + 3):

A) Any Three circuits simulated in Simulation laboratory
B) Any Three of the following
1. Class A Power Amplifier (with transformer load)
2. Class B Power Amplifier
3. Single Tuned Voltage Amplifier
4. Series Voltage Regulator
5. Shunt Voltage Regulator
6. Hartley Oscillator
7. Colpitts Oscillator

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II Year B.Tech. ECE-I Semester

(1G336) PULSE AND DIGITAL CIRCUITS LAB

Minimum Twelve experiments to be conducted:

1. Linear wave shaping-Integrator
2. Linear wave shaping-Differentiator
3. Non-Linear wave shaping – Clippers
4. Non-Linear wave shaping – Clampers
5. Transistor as a switch
6. Logic Gates
7. Sampling Gates
8. Astable Multivibrator
9. Monostable Multivibrator
10. Bistable Multivibrator
11. Schmitt Trigger
12. UJT Relaxation Oscillator
13. Bootstrap sweep circuit
14. Constant Current Sweep Generator using BJT
15. Inverter characteristics

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II Year B.Tech. ECE-II Semester

(1GC41) MATHEMATICS – III
(Common to ECE and EEE)

UNIT I: Beta and Gamma Functions – their properties – Evaluation of improper integrals using Beta and Gamma functions.

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

UNIT III ELEMENTARY FUNCTIONS: Exponential trigonometric, hyperbolic functions and their properties – General power z^c (c is complex), principal value.

UNIT IV COMPLEX INTEGRATION: Line integral – Evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula.

UNIT V COMPLEX POWER SERIES: Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series. Singular point – Isolated singular point – Pole of order m – Essential singularity.

UNIT VI: Residue – Evaluation of residue by formula and by Laurent series – Residue theorem. Evaluation of integrals of the type $\int_{-\infty}^{\infty} f(x)dx \quad and \quad \int_{0}^{2\pi} f(\cos\theta, \sin\theta)d\theta$

UNIT VII: Argument principle – Rouche's theorem – Determination of number of zeros of complex polynomials — Fundamental theorem of Algebra.

UNIT VIII CONFORMAL MAPPING: Definition – Translation, rotation, and inversion – Bilinear transformation -Fixed point – Cross ratio – Determination of bilinear transformation mapping three given points - Transformation by e^z, $\ln z$, z^2, z^n, $\sin z$, $\cos z$.

TEXT BOOKS:

1. B. S. Grewal, *Higher Engineering Mathematics*, Khanna Publication.
2. E. Rukmangadachari, E. Keshava Reddy, *A Text Book of Engineering Mathematics-III*, Pearson Education.

REFERENCE BOOKS:

1. B. V. Ramana, *A Text Book of Engineering Mathematics*, Tata Mc Graw Hill.
2. T.K. V Iyengar, B. Krishna Gandhi and Others, *A Text Book of Engineering Mathematics, Vol – III*, S. Chand & Company.
3. Chruchile and Brown, *Complex Variables*.
4. Schaum's Series, *Complex Variables*.

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II Year B.Tech. ECE-II Semester

(1G341) SIGNALS AND SYSTEMS

UNIT I SIGNAL ANALYSIS: Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

UNIT II FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS: Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum

UNIT III FOURIER TRANSFORMS: Deriving Fourier transform from Fourier series, Fourier transform of arbitrary signal, Fourier transform of standard signals, Fourier transform of periodic signals, properties of Fourier transforms, Fourier transforms involving impulse function and Signum function. Introduction to Hilbert Transform.

UNIT IV SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS: Linear system, impulse response, Response of a linear system, Linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortion less transmission through a system, Signal bandwidth, system bandwidth, Ideal LPF, HPF and BPF characteristics, Causality and Poly-Wiener criterion for physical realization, relationship between bandwidth and rise time.

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

UNIT VI SAMPLING: Sampling theorem – Graphical and analytical proof for Band Limited Signals, impulse sampling, Natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, Introduction to Band Pass sampling.

UNIT VII 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's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT VIII Z–TRANSFORMS: Fundamental difference between continuous and discrete time signals, discrete time signal representation using complex exponential and sinusoidal components, Periodicity of discrete time using complex exponential signal, Concept of Z-Transform of a discrete sequence. Distinction between Laplace, Fourier and Z transforms. Region of convergence in Z-Transform, constraints on ROC for various classes of signals, Inverse Z-transform, properties of Z-transforms.

TEXT BOOKS:

1. B.P. Lathi- *Signals, Systems & Communications*, BS Publications, 2003.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, *Signals and Systems* – PHI, 2nd Edn.

REFERENCE BOOKS:

1. Simon Haykin and Van Veen, *Signals & Systems*, Wiley, 2nd Edition.

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II Year B.Tech. ECE-II Semester

(1G244) LINEAR CONTROL SYSTEMS
(Common to ECE and EEE)

UNIT I INTRODUCTION: Concepts of Control Systems-Classification- Open Loop and closed loop control systems and their differences-Examples- Feed-Back Characteristics, Effects of feedback-Mathematical models-differential Equations.

UNIT II TRANSFER FUNCTION REPRESENTATION: Transfer function-Mechanical Translational & Rotational systems, electrical analogy –Transfer function of DC servo motor – AC servo motor -synchro transmitter and receiver – Block Diagram representation of systems considering electrical systems as examples- Block diagram algebra, Signal Flow graph and Mason's gain formula.

UNIT III TIME RESPONSE ANALYSIS: Types of test signals, Type and Order of a systems, Time Response of first and second order system, Time domain specifications- and– steady state error – static error constants – generalized error coefficients.

UNIT IV STABILITY ANALYSIS IN s-DOMAIN: Concepts of stability: Characteristic equation, location of roots in s-plane for stability, asymptotic stability and relative stability, Routh-Hurwitz stability criterion.
Root Locus Technique: Root locus concept - construction of root loci-effects of adding poles and zeros to G(s) H(s) on the root loci.

UNIT V FREQUENCY RESPONSE ANALYSIS: Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.

UNIT VI STABILITY ANALYSIS IN FREQUENCY DOMAIN: Polar Plots-Nyquist plots stability in frequency domain using Nyquist stability criterion–simple problems.

UNIT VII DESIGN AND COMPENSATION OF CONTROL SYSTEMS: Introduction to Compensation networks – Lag, Lead, Lead-Lag controllers Design in Frequency Domain– Effects of PI, PD & PID controllers.

UNIT VIII STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS: Concepts of state, state variables and state model-derivation of state model for physical systems Diagonalization- State transition Matrix and its properties – Solution of linear state equation – Concepts of controllability and Observability

TEXT BOOKS:

1. J. Nagrath and M. Gopal, *Control Systems Engineering*, 2nd edition, New Age International (P) Limited, Publishers.

2. Xavier .S. P. Eugune, Joseph Cyril Babu, *Principles of control systems*, S.Chand&Company.

REFERENCE BOOKS:

1. Katsuhiko Ogata, *Modern Control Engineering,* 3rd edition, Prentice Hall of India Pvt. Ltd., 1998.
2. NISE, *Control Systems Engg,* 3rd Edition, John wiley.
3. Richard C. Dorf, Robert H. Bishop, *Modern control systems,* 11th edition, Pearson education, 2007.
4. Graham Goodwin**,** Stefan Graebe and Mario Salgado, *Control System Design,* prentice hall.

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II Year B.Tech. ECE – II Semester

(1G245) SWITCHING THEORY AND LOGIC DESIGN

UNIT I NUMBER SYSTEMS & CODES: Philosophy of number systems – r,(r-1)'complement ,representation of negative numbers, binary arithmetic, binary codes, error detecting & error correcting codes, hamming codes.

UNIT II BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS: Fundamental postulates of Boolean Algebra, Basic theorems (Duality, De-Morgan's, Shannon's)and properties, switching functions-Canonical and Standard forms, algebraic simplification using Boolean theorems, digital logic gates, properties of XOR gate, universal gates, Two level and Multi level Realization of Boolean Functions using Universal Gates.

UNIT III MINIMIZATION OF SWITCHING FUNCTIONS: k-Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime-Implicant chart, simplification rules.

UNIT IV COMBINATIONAL LOGIC DESIGN: Design using conventional logic gates-Binary Adders, Subtractors, Ripple Adders and subtractor Adders, Look ahead carry Adders, Decimal adder-BCD adder, Modular design using IC chips-Magnitude comparator, Encoder, Decoder, Multiplexer- MUX Realization of switching functions, De-Multiplexer, Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT V PROGRAMMABLE LOGIC DEVICES: Basic PLD's-ROM, PROM, PLA, PAL, Realization of Switching functions using PLD's. Comparison between PLA, PAL, ROM.

UNIT VI SEQUENTIAL CIRCUITS – I: Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples), Basic flip-flops, Triggering and excitation tables ,flip flop conversions ,Steps in synchronous sequential circuit design, Design of modulo-N Synchronous counters- up/down counter, ring counter, Johnson counter, Design of modulo-N Asynchronous counter-Sequence detector, Serial binary adder.

UNIT VII SEQUENTIAL CIRCUITS – II: Finite state machine-capabilities and limitations, Mealy and Moore models and their conversions, minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods, concept of minimal cover table.

UNIT VIII ALGORITHMIC STATE MACHINES: Salient features of the ASM chart, Simple examples, System design using data path and control subsystems, control implementations-Decoder, MUX, per state one Flip Flop, PLA. Example :Binary multiplier.

TEXT BOOKS:

1. Morris Mano *Digital Design,* 3/e., Prentice Hall India.
2. Zvi Kohavi, *Switching & Finite Automata theory,* 2/e., Tata McGraw Hill.

REFERENCE BOOKS:

1. Fletcher, *an Engineering Approach to Digital Design,* Prentice Hall India.
2. A Anand Kumar, *Switching Theory and Logic Design,* Prentice Hall India, 2008.

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II Year B.Tech. ECE-II Semester

(1G342) ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

UNIT I ELECTROSTATIC FIELDS: Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss's Law and Applications, Electric Potential, Relations Between E and V-Maxwell's Equations, Energy Density.

UNIT II ELECTRICAL FIELDS IN MATERIAL SPACE: Introduction**,** Convection and Conduction Currents, Conductors, Polarization in Dielectrics, Dielectric Constant and strength, Linear, Isotropic and Homogeneous Dielectrics, Continuity Equation and Relaxation Time, Poisson's and Laplace's Equations, Resistance and Capacitance.

UNIT III MAGNETOSTATIC FIELDS: Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Equations for Static EM Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductors and Inductances, Magnetic Energy.

UNIT IV MAXWELL'S EQUATIONS: Faraday's Law, Transformer and Motionl EMFs, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Final Forms, Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric-Conductor Interfaces.

UNIT V EM WAVE PROPAGATION: Introduction, Waves in general, Wave propagation in Lossy Dielectrics, Plane waves in Lossless Dielectrics, Plane Waves in Free space, Plane waves in Good conductors.

UNIT VI EM WAVE CHARACTERISTICS: Poynting Vector and Poynting Theorem – Applications, Reflection of Plane Wave – Normal and Oblique Incidences.

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

UNIT VIII TRANSMISSION LINES – II: Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR.UHF Lines as Circuit Elements; λ/4, λ /2, λ /8 Lines – Impedance Transformations. Smith Chart – Configuration and Applications, Single and Double Stub Matching.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Nathan Ida, *Engineering Electromagnetics*, Springer (India) Pvt. Ltd., New Delhi, 2nd edition, 2005.
2. John D. Ryder, *Networks, Lines and Fields*, PHI, 2nd edition, 1999.
3. William H. Hayt Jr. and John A. Buck*, Engineering Electromagnetics*,TMH, 7th edition, 2006.

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II Year B.Tech. ECE-II Semester

(1G246) ELECTRICAL TECHNOLOGY

UNIT I TRANSIENT ANALYSIS: Transient response of RL, RC series, RLC circuits for DC excitations, initial conditions, solution using differential equations approach and laplace transform method.

UNIT II TWO PORT NETWORKS: Impedance parameters, admittance parameters, hybrid parameters, transmission (ABCD) parameters, conversion of one parameter to another, conditions for reciprocity and symmetry, inter connection of two port networks in series, parallel and cascaded configurations, image parameters, illustrative problems.

UNIT III FILTERS: Classification of filters, filter networks, classification of pass band and stop band, characteristic impedance in the pass band & stop bands, constant-k Low pass filter, high pass filter, m-derived T-section, band pass filter and band elimination filter, illustrative problems.

UNIT IV SYMMETRICAL ATTENUATORS: Symmetrical attenuators – T-type attenuator, Π -type attenuator, bridged T type attenuator, lattice attenuator.

UNIT V D.C.GENERATORS: Constructional features-single lap and wave windings-EMF equation-methods of excitation- characteristics of shunt, series and compound generators.

UNIT VI D.C. MOTORS: Principle of operation —torque equation- speed-torque characteristics of shunt, series and compound Motors – Losses and efficiency–testing– Swinburne's test and brake test– Speed control of DC shunt motor

UNIT VII TRANSFORMERS AND THEIR PERFORMANCE: Principle of operation of single phase transformer, types , constructional features, phasor diagram on No load and load, equivalent circuit, losses and efficiency of transformer and regulation, OC and SC tests, predetermination of efficiency and regulation (simple problems).

UNIT VIII: SPECIAL MACHINES-Principle of operation - shaded pole motors, capacitor motors, AC servomotor, AC tachometers, synchros, stepper motor - characteristics.

TEXT BOOKS:

1. A. Sudhakar, Shyam mohan S.Pilli, *Network Analysis,* Tata McGraw Hill, 3rd Edition, New Delhi, 2009. 2. B.L. Theraja and A.K.Theraja, *A text book Electrical Technology,* Vol – 2, S. Chand Company, New Delhi, 2010.

REFERENCE BOOKS:

1. John D. Ryder, *Networks, Lines and Fields*, 2nd edition, Prentice Hall India, New Delhi, 2009.
2. C.L. Wadhwa, *Network Analysis and Synthesis*, New Age International Publishers, 3rd Edition, 2007.
3. T.K. Nagasarkar and M.S. Sukhija, *Basic Electrical Engineering*, Oxford University Press, New Delhi, 2005.
4. W.H. Hayt and J.E. Kemmerly and S.M. Durbin, *Engineering Circuits Analysis*, Tata McGraw Hill, 6th Edition, New Delhi, 2006.
5. M.S. Naidu and S. Kamakshaiah, *Introduction to Electrical Engineering*, Tata McGraw Hill, New Delhi, 2008.

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II Year B.Tech. ECE-II Semester

(1GC44) SOFT SKILLS-I
(Common to ECE and EEE)

APTITUDE AND REASONING SKILLS
QUANTITATIVE APTITUDE:

- Number Systems, Averages, Problems on ages, Allegations, Percentages, Profit and Loss, Simple interest and Compound Interest, Ratio and Propositions and Variation, Time and Work, Time and Distance, Mensuration, Functions, Set Theory, Permutation and Combinations, Probability, Progressions, Inequalities, Coordinate Geometry, Quadratic Equations, Logarithms
- HCF and LCM, Decimal Fractions, Simplification, Square Roots and Cube Roots, Surds and Indices, Pipes and cisterns, Area, Volume and Surface Areas, Races and Games, Calendar, Clocks, Stocks and Shares, True Discount, Banker's Discounts
- Data Interpretation, Tabulation, Bar Graphs, Pie Charts, Line Graphs

REASONING:

- Directions, Blood Relations, Problems on cubes, Series and sequences, odd man out, Coding and decoding, Data Sufficiency, logical deductions, Arrangements and Combinations, Groups and Teams, General Mental Ability, Puzzles to puzzle you, More Puzzles, Brain Teasers, Puzzles and Teasers.

REFERENCE BOOKS:

1. Arun Sharma, *How to Prepare for Quantitative Aptitude*, TMH Publishers, New Delhi, 2003.
2. R.S. Agarwal, *Quantitative Aptitude*, S.Chand Publishers, New Delhi, 2005.
3. Sharon Weiner-Green, Ira K. Wolf, *Barron's GRE*, Galgotia Publications, New Delhi, 2006.
4. R.S Agarwal, *Verbal and Non-Verbal Reasoning*, S. Chand Publishers, New Delhi, 1998.
5. Shakuntala Devi, *Puzzles to Puzzle You*, Orient Paper Backs Publishers, New Delhi, 2005.
6. Shakuntala Devi, *More Puzzles*, Orient Paper Backs Publishers, New Delhi, 2006.
7. Ravi Narula, *Brain Teasers*, Jaico Publishing House, New Delhi, 2005.
8. George J Summers, Puzzles and Teasers, Jaico Publishing House, Mumbai, 2005.

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II Year B.Tech. ECE-II Semester

(1G344) SIGNALS AND SYSTEMS LAB

LIST OF PROGRAMS (Run minimum 12 programs)

1. Introduction to Matlab and 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.
3. Operations 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/ sequence and real and imaginary parts of signal.
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. Finding the Fourier transform of a given signal and plotting its magnitude and phase spectrum.
10. Waveform synthesis using Laplace Transform.
11. Locating the zeros and poles and plotting the pole-zero maps in S plane and Z-plane for the given transfer function.
12. Sampling theorem verification.
13. Simulate Gibb's Phenomenon
14. Simulate Weiner-Khinchine's Theorem
15. Simulate and Prove Wide Sense Stationary

Requirement: Matlab 7.8 V (R2009b) and above

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II Year B.Tech. ECE-II Semester

(1G249) ELECTRICAL TECHNOLOGY LAB

ANY TEN EXPERIMENTS FROM THE FOLLOWING

PART – A

1. Serial and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination of RLC network.
2. Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
3. Two port network parameters – Z-Y Parameters.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.
6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.

PART – B

1. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
2. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
3. Brake test on DC shunt motor. Determination of performance characteristics.
4. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
5. Brake test on 3-phase Induction motor (performance characteristics).
6. Regulation of alternator by synchronous impedance method.

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III Year B.Tech. ECE-I Semester

(1G351) ANALOG COMMUNICATIONS

UNIT I INTRODUCTION: Introduction to communication system, Need for modulation, Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector.

UNIT II DSB MODULATION: Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.

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

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

UNIT V NOISE: Noise in Analog communication System, Noise in DSB & SSB System Noise in AM System, Noise in Angle Modulation System, Threshold effect in Angle Modulation System, Pre-emphasis & de-emphasis.

UNIT VI TRANSMITTERS: Radio Transmitter - Classification of Transmitters, AM Transmitter, Effect of feedback on performance of AM Transmitter, FM Transmitter – Variable reactance type and phase modulated FM Transmitter, frequency stability of FM Transmitter

UNIT VII RECEIVERS: Radio Receiver - Receiver Types - Tuned radio frequency receiver, Super-heterodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting

UNIT VIII PULSE MODULATION: Multiplexing-TDM, FDM, Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation & demodulation of PWM, PPM: Generation and demodulation of PPM

TEXT BOOKS:

1. H Taub & D. Schilling, Gautam Sahe - *Principles of Communication Systems*, TMH, 2007 3rd Edition.
2. John G. Proakis, Masood Salehi - *Fundamentals of Communication Systems* PEA, 2006.

REFERENCE BOOKS:

1. Simon Haykin, John Wiley - *Principles of Communication Systems* , 2nd Ed.,
2. B.P. Lathi - *Communication Systems*, BS Publication, 2006.
3. George Kennedy and Bernard Davis - *Electronics & Communication System*, TMH 2004.

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III Year B.Tech. ECE-I Semester

(1G352) LINEAR IC APPLICATIONS

UNIT I DIFFERENTIAL AND CASCODE AMPLIFIERS: Differential amplifier –DC and AC analysis of Dual input balanced output configuration, Properties of other differential amplifier configuration (dual input unbalanced output, single ended input-balanced/unbalanced output), cascaded differential amplifier stages, FET differential amplifier, constant current bias, current mirror, Level Translator. Cascode amplifier-DC & AC Analysis

UNIT II OPERATIONAL AMPLIFIERS: operational amplifier, block diagram representation of typical Op-Amp, integrated circuits-types, classification, package types and temperature ranges, power supplies, ideal and practical OP-Amp specifications, 741 OP-Amp and its features, open loop OP-Amp configuration, characteristics of Op-Amp DC characteristics-input bias current, input offset voltages and currents, total output offset voltage, thermal drift, AC characteristics- frequency response stability of Op-Amp, frequency compensation, slew rate, CMRR, PSRR.

UNIT III LINEAR APPLICATIONS OF OP-AMPS: Inverting and non-inverting amplifier, adder, substractor, adder-substractor, AC amplifier, integrator and differentiator, differential amplifiers- differential amplifier with one Op-Amp and differential amplifier with two Op-Amp , instrumentation amplifier, V-I, I-V converters, voltage follower.

UNIT IV NON-LINEAR APPLICATIONS OF OP-AMPS: Comparators and applications, Multivibrators- astable and monostable, Schmitt trigger, Triangular and saw tooth wave generators, Log and antilog amplifiers, precision rectifiers.

UNIT V ACTIVE FILTERS: Introduction, active filters, Butterworth filters-first order, second order LPF, HPF filters design. Band pass filters-wide band-pass, narrow band-pass filters, Band reject- wide band-reject, narrow band-reject filters, all-pass filters.

UNIT VI 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, 565 PLL , Applications of PLL-Frequency multiplication, frequency translation, AM, FM and FSK demodulators.

UNIT VII D/A AND A/D CONVERTERS: Introduction, Basic DAC techniques, weighted resistor DAC, R-2R Ladder DAC, Inverted R-2R DAC monolithic DAC, ADCs-parallel comparator type ADC, counter type ADC, servo or tracking ADC, successive approximation ADC, Dual slope ADC,DAC and ADC specifications.

UNIT VIII ANALOG MULTIPLIERS AND MODULATORS: Multipliers-types and applications, balanced modulator-principle, IC 1496 balanced modulator, analog switches, sample and hold circuit.

TEXT BOOKS:

1. Ramakanth A. Gayakwad - *Op-Amps & Linear ICs* , 4th edition, PHI, 1987.
2. D. Roy Chowdhury - *Linear Integrated Circuits* , New Age International (p) Ltd, 2nd Edition, 2003.

REFERENCE BOOKS:

1. David A. Bell - *Operational Amplifiers & Linear ICs*, 2nd edition, Oxford University Press, 2010.
2. Sergio Franco - *Design with Operational Amplifiers & Analog Integrated Circuits*, McGraw Hill, 1988.
3. C.G. Clayton *Operational Amplifiers*, Butterworth & Company Publ. Ltd./Elsevier, 1971.

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III Year B.Tech. ECE-I Semester

(1G353) DIGITAL IC APPLICATIONS

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

UNIT II BIPOLAR LOGIC AND INTERFACING: Bipolar logic, Transistor logic, TTL families, CMOS/TTL interfacing, low voltage CMOS logic and interfacing, Emitter coupled logic, Comparison of logic families, Familiarity with standard 74XX and CMOS 40XX series-ICs – Specifications.

UNIT III THE VHDL HARDWARE DESCRIPTION LANGUAGE: Design flow, program structure, Objects, Data types, Operators, functions and procedures, libraries and packages.

UNIT IV THE VHDL DESIGN ELEMENTS: Structural design elements, data flow design elements, behavioral design elements, time dimensions

UNIT V COMBINATIONAL LOGIC DESIGN: Decoders, encoders, three state devices, multiplexers and demultiplexers, Code Converters, EX-OR gates and parity circuits, comparators, adders & subtractors, ALUs, Combinational multipliers. VHDL models for the above ICs.

UNIT VI DESIGN EXAMPLES (USING VHDL): Design examples (using VHDL) - Barrel shifter, comparators, floating-point encoder, dual-priority encoder, Ones counter

UNIT VII SEQUENTIAL LOGIC DESIGN: Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

UNIT VIII SEMICONDUCTOR MEMORIES: ROMs: Internal structure, 2D-decoding, commercial ROMs, ROM timing. **Static RAM**: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS. **Dynamic RAM:** Internal structure, timing, synchronous DRAMs.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. Charles H. Roth Jr- *Digital System Design Using VHDL*, PWS Publications, 2nd edition, 2008.
2. Kenneth L Short – *VHDL for Engineers*, Pearson Education 2009.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-I Semester

(1G354) ANTENNAS AND WAVE PROPAGATION

UNIT I ANTENNA BASICS: Introduction, Basic Antenna Parameters ,Patterns, Beam Area, Radiation Intensity, Beam Efficiency, Directivity and Gain, Directivity and Resolution, Antenna Apertures, Effective Height, Fields from Oscillating dipole, Antenna Field Zones, Shape-impedance Considerations.

UNIT II THIN LINEAR WIRE AND LOOP ANTENNAS: Retarded Potentials, Radiation from Small Electric Dipole, Quarter wave Monopole and Half wave Dipole – Current Distributions, Evaluation of Field Components, Power Radiated by a current element , Radiation Resistance, Beam widths, Directivity, Effective Area and Effective Height. Antenna Theorems – Reciprocity Theorem, Loop antennas: Small Loops - Field Components, Comparison of far fields of small loop and short dipole, Concept of short magnetic dipole, D and Rr relations for small loops.

UNIT III ANTENNA ARRAYS: Two element arrays –Principle of Pattern Multiplication , N element Uniform Linear Arrays – Broadside, End fire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison, Binomial Arrays, Arrays with Parasitic Elements, Yagi - Uda Arrays, Folded Dipoles & their characteristics.

UNIT IV NON-RESONANT RADIATORS: Introduction, Travelling wave radiators – basic concepts, Long wire antennas – field strength calculations and patterns, V-antennas, Rhombic Antennas and Design Relations, Helical Antennas: Helical Geometry, Helix modes, Design considerations for monofilar helical antennas in Axial Mode and Normal Modes.

UNIT V VHF, UHF AND MICROWAVE ANTENNAS: Horn Antennas – Types, Optimum Horns, Design Characteristics of Pyramidal Horns. Reflector Antennas: Flat Sheet and Corner Reflectors. Paraboloidal Reflectors – Geometry, characteristics, types of feeds, Spill Over, Back Lobes, Aperture Blocking, Horn Feeds and Cassegrain Feeds. Lens Antennas – Geometry, Dielectric Lenses and Zoning, Antenna Measurements – Patterns to be measured and Set Up, Directivity and Gain Measurements.

UNIT VII GROUND WAVE PROPAGATION: Introduction to wave propagation-Definition and Broad Categorization, Classification of Electromagnetic waves based on Modes of propagation, Wave Environment, Different modes of Wave Propagation Ground Wave Propagation–Introduction, Plane earth reflection, Space wave and surface wave, Transition between surface and space wave, Tilt of Wave front due to ground losses, Impact of Imperfect Earth, Reduction factor and numerical Distance, Earth's Behavior at different frequencies, Electrical Properties of earth, Curved earth reflection.

UNIT VII SPACE WAVE PROPAGATION: Introduction, Effect of imperfection of Earth, Effects due to - curvature of earth, interference zone, Shadowing of hills and buildings, Absorption by Atmospheric phenomena, Variation of field strength with Height, Super refraction, Scattering Phenomena, Tropospheric propagation, Fading.

UNIT VIII SKY WAVE PROPAGATION: Introduction, Structural details of Ionosphere, Wave propagation mechanism, Refraction and reflection of Sky waves by Ionosphere, Ray path, Critical Frequency, MUF, LUF, OF, Virtual Height and Skip Distance, Relation between MUF and Skip distance, Impact of Solar activity, Multihop propagation, Take-off angle, Energy loss in Ionosphere and Sky wave signal strength, Wave Characteristics.

TEXT BOOKS:

1. John D. Kraus, Ronald J. Marhefka and Ahmad S Khan – *"Antennas and Wave Propagation" TMH, 4e, Special Indian Edition 2010.*
2. E.C. Jordan and K.G. Balmain - *Electromagnetic Waves and Radiating Systems, PHI, 2nd ed., 2000*

REFERENCE BOOKS:

1. K.D.Prasad - *Antenna and wave propagation, Khanna Publications.*

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-I Semester

(1G457) COMPUTER SYSTEM ARCHITECTURE

UNIT I BASIC STRUCTURE OF COMPUTERS: Computer types, Functional units, Basic operational concepts, Bus structures, Software, performance, multiprocessors and multi computers. Data types, Complements, Data representation: Fixed point and floating point representations, Error detection codes.

UNIT II REGISTER TRANSFER LANGUAGE AND MICRO-PERATIONS: Register transfer language, register transfer, Bus and memory transfer, Arithmetic Micro Operations, logic micro operations, shift micro operations, arithmetic logic shift unit, Instruction codes, Computer registers computer instructions-Instruction cycle, memory-reference instructions, input-output and interrupt.

UNIT III CENTRAL PROCESSING UNIT: Stack organization, Instruction formats, Addressing modes, data transfer and manipulation, Program control, reduced instruction set computer.

UNIT IV MICRO PROGRAMMED CONTROL: Control memory, Address sequencing, micro program example, design of control unit-hardwired control, micro programmed control.

UNIT V COMPUTER ARITHMETIC: Addition and subtraction, multiplication algorithms, Davison algorithms, floating point arithmetic operations, Decimal arithmetic unit, and Decimal arithmetic operations.

UNIT VI: THE MEMORY SYSTEM: Memory hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, virtual memory, memory management hardware.

UNIT VII: INPUT-OUTPUT ORGANIZATION: Peripheral devices, input-output interface, Asynchronous data transfer modes of transfer, Priority Interrupt, Direct Memory Access, Input-output processor(IOP), Serial communication.

UNIT VIII PIPELINE AND VECTOR PROCESSING: Parallel processing, pipelining, Arithmetic pipeline, Instruction Pipeline, RISC pipeline vector processing, Array Processing.

Multi Processors: Characteristics of multiprocessors, interconnection structures, Inter processor Arbitration, Inter processor Communication and synchronization, Cache coherence.

TEXT BOOKS:

1. M.Moris Mano, *Computer System Architecture*, PHI, III Edition, 2006.
2. Car Hamacher, Zvonko Vranesic, Safwat Zaky, Car Hamacher, Zvonks Vranesic, Safwat Zaky,*Computer Organization* , McGrawHill,V Edition, 2002.

REFERENCE BOOKS:

1. William stallings, *Computer Organization and Architecture,* PHI, Seventh Edition, 2006.
2. John P.Hayes, *Computer Architecture and Organization,* Mc Graw Hill International editions, 1998.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-I Semester

(1GA51) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS
(Common to ECE and ME)

UNIT I INTRODUCTION TO MANAGERIAL ECONOMICS: Definition, Nature and Scope of Managerial Economics – Relationship with other functional areas (Accounting, Marketing, HR, Production and Operations) of decision making - Basic Economic Principles - Opportunity Cost, Incremental Concept, scarcity, Marginalism, Equi-marginalism, Time perspective, Discounting principle, Risk and Uncertainty.

UNIT II DEMAND ANALYSIS: Meaning and types of demand – Determinants of demand - Law of Demand and its exceptions. Definition, types and measurement of elasticity of demand – Supply function and Elasticity of Supply - Demand Forecasting methods: Survey Methods - Consumers Survey Method, Sales force opinion method, experts opinion method - Statistical Methods: Trend Projection, Barometric, Regression, Simultaneous Equation method.

UNIT III PRODUCTION AND COST ANALYSIS: Production Function, Cobb - Douglas Production function - Isoquants and Isocosts curves – MRTS - Least Cost Combination of Inputs - Laws of Returns, Internal and External Economies of Scale - Cost concepts, Determinants of cost, cost-output relationship in short run and Long run - Break-even Analysis (BEA): Objectives, Assumptions, Importance, Graphical representation, Limitations (Simple Numerical Problems).

UNIT IV MARKET STRUCTURE AND PRICING METHODS: Competitive structure of markets – Perfect competition - Monopoly, Monopolistic and Oligopoly Markets - Price-output determination under perfect competition and monopoly in Long run and short run.
Pricing Methods: Cost Plus Pricing - Marginal Cost Pricing - Sealed Bid Pricing - Going Rate Pricing - Limit Pricing - Market Skimming Pricing - Penetration Pricing - Two-Part Pricing - Block Pricing - Bundling Pricing - Peak Load Pricing.

UNIT V TYPES OF BUSINESS ORGANIZATIONS: Forms of Business Organizations – Need and role of public and private sector business organization - Types, Features, Merits and Demerits of public and private sector business organizations – Problems and remedies of public sector business organizations.

UNIT VI CAPITAL AND CAPITAL BUDGETING: Capital and its significance - Types of Capital - Sources of Raising Capital – Features of Capital budgeting - Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR), Net Present Value Method, Profitability index and Internal rate of return method (Simple problems).

UNIT VII FINANCIAL ACCOUNTING: Double-Entry Book Keeping, Journal, Ledger, Trial Balance- Final Accounts - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

UNIT VIII FINANCIAL ANALYSIS THROUGH RATIOS: Financial Ratios and its significance - Liquidity Ratios: Current Ratio, quick ratio and Absolute quick ratio - Turnover Ratios: Inventory turnover ratio, Debtors Turnover ratio, Working Capital Turnover ratio, Creditors Turnover ratio, Fixed Assets Turnover ratio - Solvency Ratios: Debt- Equity ratio, Interest Coverage ratio and Debt to total funds ratio -Profitability ratios: Gross Profit Ratio, Net Profit ratio and Proprietary ratio.

TEXT BOOKS:

1. Mehta P.L., *Managerial Economics-Analysis, Problems, Cases*, S Chand and Sons, New Delhi, 2001.
2. Dwivedi, *Managerial Economics*, Vikas , 6th Ed.
3. S.N.Maheswari & S.K. Maheswari, *Financial Accounting*, Vikas.
4. M.E.Thukaram Rao., *Accounting for Managers*, New Age International Publishers.

REFERENCE BOOKS:

1. Varshney & Maheswari, *Managerial Economics,* Sultan Chand, 2003.
2. T.S. Reddy and Y.Hari Prasad Reddy, *Accounting and Financial Management*, Margham Publications.
3. Ambrish Gupta, *Financial Accounting for Management*, Pearson Education, New Delhi.
4. S. A. Siddiqui & A. S. Siddiqui, *Managerial Economics & Financial Analysis*, New age International Space Publications ess.
5. Narayanaswamy, *Financial Accounting—A Managerial Perspective*, PHI
6. Truet and Truet, *Managerial Economics:Analysis, Problems and Cases*, Wiley.

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III Year B.Tech. ECE-I Semester

(1G357) IC APPLICATIONS LAB

Part A (IC Application Lab – Minimum 5):

1. OP AMP Applications – Adder & Subtractor Circuits
2. Active Filter Applications – LPF, HPF (first order)
3. Function Generator using OP AMPs
4. IC 555 Timer – Monostable and Astable Operation Circuit
5. IC 566 – VCO Applications
6. Voltage Regulator using IC 723
7. 4 bit DAC using OP AMP

Part B (ECAD Lab – Minimum 7):

Simulate the internal structure of the following Digital IC's using VHDL and verify the operations of the Digital IC's (Hardware) in the Laboratory

1. Logic Gates- 74XX
2. Half Adder, Half Subtractor, Full Adder, Full Subtractor
3. 3-8 Decoder -74138
4. 8-3 Encoder- 74X148
5. 8 x 1 Multiplexer -74X151
6. 4 bit Comparator-74X85
7. D Flip-Flop 74X74
8. JK Flip-Flop 74X109
9. Decade counter-74X90
10. Universal shift register -74X194

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III Year B.Tech. ECE-I Semester

(1GC51) ADVANCED ENGLISH COMMUNCATION SKILLS LAB
(Common to ECE and EEE)

RESUME PREPARATION

Structure, formats and styles – planning - defining career objective - projecting one's strengths and skills - creative self marketing–sample resumes - cover letter.

INTERVIEW SKILLS

Concept and process - pre-interview planning – preparation - body language - answering strategies – frequently asked questions .

GROUP DISCUSSION

Communicating views and opinions – discussing – intervening – agreeing and disagreeing –asking for and giving clarification - substantiating - providing solution on any given topic across a cross-section of individuals - modulation of voice and clarity - body language – case study.

ORAL PRESENTATIONS (INDIVIDUAL)

Collection of data from various sources –planning, preparation and practice – attention gathering strategies -transition – handling questions from audience.

ORAL PRESENTATIONS (TEAM)

Appropriate use of visual aids – Using PowerPoint for presentation

READING COMPREHENSION

Reading for facts – scanning – skimming - guessing meanings from context– speed reading.

LISTENING COMPREHENSION

Listening for understanding - responding relevantly.

MINIMUM REQUIREMENTS:

Advanced English Language Communication Skills Lab is conducted at two places:

- Computer-aided Language Lab with 60 computer machines, one teacher console, LAN facility and Language Learning software for self-study.
- Communication Skills Lab with movable chairs, a discussion room, Public Address System, a Television, a DVD Player, a camcorder, an LCD Projector and a computer machine.
- Manual cum Record, prepared by Faculty Members of English of the college will be used by students.

SUGGESTED SOFTWARE:

- It's your Job published by Clarity.
- Business Writing published by Clarity.
- Active Listening published by Clarity.
- Active Reading published by Clarity.
- Software published by Globerana.
- Cambridge Advanced Learner's Dictionary.
- Oxford Advanced Learner's Dictionary.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-II Semester

(1G361) VLSI DESIGN

UNIT I INTRODUCTION: Introduction to IC technology-MOS, PMOS, NMOS, CMOS and BI-CMOS technologies-oxidation, lithography, diffusion, Ion implantation, metallization , Encapsulation, probe testing, integrated resistors and capacitors.

UNIT II BASIC ELECTRICAL PROPERTIES: Basic electrical properties of MOS and BI-CMOS circuits: I_{ds}-V_{ds} relationships, MOS transistor threshold voltage, g_m, g_{ds}, figure of merit; pass transistor, NMOS inverter, various pull-ups, CMOS inverter analysis and design, BI-CMOS inverters.

UNIT III VLSI CIRCUIT DESIGN PROCESSES: VLSI design flow, MOS layers, stick diagrams, design rules and lay out,2 m CMOS design rules for wires, contacts and transistors layout diagrams for NMOS and CMOS inverters and gates, scaling of MOS circuits, limitations of scaling.

UNIT IV GATE LEVEL DESIGN: Logic gates and other complex gates, switch logic, alternate gate circuits, basic circuit concepts, sheet resistance RS and its concept to MOS, area capacitance units, calculations-(Micro)-delays, driving large capacitive loads, wiring capacitances, fan-in and fan-out, choice of layers.

UNIT V SUB SYSTEM DESIGN: Sub system design, shifters, adders, ALUs, multipliers, parity generators, comparators, zero/one detectors, counters, high density memory elements.

UNIT VI SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN: PLAs, FPGAs, CPLDs, standard cells, programmable array logic, design approach.

UNIT VII VHDL SYNTHESIS: VHDL synthesis, circuit design flow, circuit synthesis, simulation, layout, design capture tools, design verification tools, test principles.

UNIT VIII CMOS TESTING: CMOS testing need for testing, test principles, design strategies for test, chip level test techniques, system-level test techniques, layout design for improved testability.

TEXT BOOKS:

1. Kamran Eshraghian, Eshraghian Dougles and A. pucknell - *Essentials of VLSI circuits and systems*, PHI, 2005 Edition.
2. Weste and EShraghian - *Principles of CMOS VLSI design*, Pearson Education, 1999.

REFERENCE BOOKS:

1. John P.Uyemura, John Wiley - *Introduction to VLSI circuits and systems*, 2003.
2. John M. Rabaey - *Digital Integrated circuits*, PHI, EEE, 1997.

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III Year B.Tech. ECE-II Semester

(1G362) MICROWAVE ENGINEERING

UNIT I INTRODUCTION TO MICROWAVE ENGINEERING & WAVE GUIDES: Wave guides- Types, Applications, Introduction to Microwave engineering, Microwave Spectrum and Bands, Applications of Microwaves. 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.

UNIT II CIRCULAR WAVEGUIDES: Introduction, Nature of Fields, Characteristic Equation, Dominant and Degenerate Modes. Impossibility of TEM mode. Microstrip Lines– Introduction, Zo Relations, Effective Dielectric Constant, Losses, Q factor. Cavity Resonators– Introduction, Rectangular and Cylindrical Cavities, Dominant Modes and Resonant Frequencies, Q factor and Coupling Coefficients.

UNIT III WAVEGUIDE ATTENUATORS, PHASE SHIFTER AND TEES: Waveguide Attenuators – Resistive Card, Rotary Vane types; Waveguide Phase Shifters – Dielectric, Rotary Vane types. Waveguide Multiport Junctions – E plane and H plane Tees, Magic Tee, Scattering Matrix– Significance, Formulation and Properties. S Matrix Calculations for – 2 port Junction, E plane and H plane Tees, Magic Tee Hybrid Ring; Directional Couplers – 2 Hole, Bethe Hole types.

UNIT IV WAVEGUIDE ISOLATORS AND CIRCULATORS: Ferrites– Composition and Characteristics, Faraday Rotation; Ferrite Components – Gyrator, Isolator, Circulator, Related Problems. Coupling Mechanisms – Probe, Loop, Aperture types. Waveguide Discontinuities – Waveguide irises, Tuning Screws and Posts, Matched Loads.

UNIT V KLYSTRONS: Limitations and Losses of conventional tubes at microwave frequencies. Microwave tubes – O type and M type classifications. O-type tubes: Two Cavity Klystrons – Structure, Reentrant Cavities, Velocity Modulation Process and Applegate Diagram, Bunching Process and Small Signal Theory – Expressions for output 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.

UNIT VI TRAVELLING WAVE TUBES AND MAGNETRONS: Significance, Types and Characteristics of Slow Wave Structures; Structure of TWT and Amplification Process, Suppression of Oscillations, Nature of the four Propagation Constants, Gain Considerations. Magnetrons – Different Types, 8-Cavity Cylindrical Travelling Wave Magnetron – Hull Cut-off and Hartree Conditions, Modes of Resonance and PI-Mode Operation, Separation of PI-Mode, output characteristics.

UNIT VII MICROWAVE SOLID STATE DEVICES: Introduction, Classification, Applications. TEDs – Introduction, Gunn Diode – Principle, RWH Theory, Characteristics, Basic Modes of Operation, Oscillation Modes, LSA Modes. Avalanche Transit Time Devices – Introduction, IMPATT and TRAPATT Diodes – Principle of Operation and Characteristics.

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

REFERENCE BOOKS:

1. R.E. Collin - *Foundations for Microwave Engineering*, IEEE Press, John Wiley, 2nd Edition, 2002.
2. M Kulkarni, *Microwave and Radar Engineering*, Umesh Publications, 1998.

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III Year B.Tech. ECE-II Semester

(1G363) MICROPROCESSORS AND INTERFACING

UNIT I 8086 ARCHITECTURE: Architecture of 8086 microprocessor, Register organization, Memory organization, Pin diagram of 8086-Minimum mode and maximum mode of operation, Timing diagrams.

UNIT II ASSEMBLY LANGUAGE PROGRAMMING: Machine language instruction formats of 8086, Addressing modes of 8086, instruction set of 8086, Assembler directives, Assembly language programs involving logical, branch and call instructions, sorting, evaluation of arithmetic expressions, string manipulation. Implementation of FOR loop.WHILE, REPEAT and IF-THEN-ELSE features. Procedure and Macros.

UNIT III I/O INTERFACING: I/O Interfacing methods – I/O mapped I/O, Memory mapped I/O Interfacing I/O ports – latches and buffers. 8255 PPI-various modes of operation and interfacing to 8086. Seven segment Displays, stepper motor, D/A, A/D converter and actuators interfacing.

UNIT IV MEMORY AND DMA CONTROLLER: Basic structure of SRAM and DRAM cell, Memory interfacing to 8086 (static RAM and EPROM). Need for DMA, Architecture of 8257 and interfacing with 8086

UNIT V PROGRAMMABLE INTERRUPT CONTROLLER: Data transfer methods-Programmed I/O; interrupt driven I/O, Interrupt structure of 8086, Vector interrupt table. Interrupt service routines. 8259 PIC architecture and interfacing, cascading of interrupt controller, simple programs. Introduction to DOS and BIOS interrupts.

UNIT VI PROGRAMMABLE INTERVAL TIMER/COUNTER: Architecture of 8253 programmable interval timer/counter, mode of operations, interfacing with 8086, and simple programs. Architecture and interfacing of Key board/display controller (8279).

UNIT VII COMMUNICATION INTERFACE: Asynchronous and synchronous data transfer schemes. Necessity of communication interfaces, 8251 USART architecture and interfacing.. Serial communication standards-, RS-232C, 20mA current loop. TTL to RS232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to high-speed serial communications standards, and USB.

UNIT VIII ADVANCED MICROPROCESSORS: Introduction to 80286.salient features of 80386, Real and protected mode segmentation and paging, salient features of Pentium and Pentium pro processors

TEXT BOOKS:

1. A.K. Ray and K.M.Bhurchandi, *Advanced microprocessor and peripherals*, 2nd edition, TMH, 2000.
2. Douglas V.Hall, *Microprocessors Interfacing*, 2nd edition, 2007.

REFERENCE BOOKS:

1. By Liu and GA Gibson, *Micro computer system 8066/8088 family Architecture, programming and Design*, PHI, 2nd Ed.
2. Bhupendra singh chabra, *Intel 8086/8088 microprocessor architecture, programming, design and interfacing,* Dhanpatrai publications.

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III Year B.Tech. ECE-II Semester

(1G364) DIGITAL AND DATA COMMUNICATIONS

UNIT I PULSE DIGITAL MODULATION: Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, Companding in PCM systems. Differential PCM systems (DPCM), Delta modulation, its draw backs, adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

UNIT II DIGITAL MODULATION TECHNIQUES: Introduction, ASK, FSK, PSK, DPSK, DEPSK, QPSK, M-ary PSK, ASK, FSK, similarity of BFSK and BPSK.

UNIT III DATA TRANSMISSION: Base band signal receiver, probability of error, the optimum filter, matched filter, probability of error using matched filter, coherent reception, non-coherent detection of FSK, calculation of error probability of ASK, BPSK, BFSK,QPSK.

UNIT IV INFORMATION THEORY AND SOURCE CODING: Introduction, Discrete messages, concept of amount of information and its properties. Average information, Entropy and its properties. Information rate, Mutual information and its properties, Advantages, Shannon's theorem, Shanon-Fano coding, Huffman coding, efficiency calculations, channel capacity of discrete and analog Channels, capacity of a Gaussian channel, bandwidth –S/N trade off.

UNIT V BLOCK AND CONVOLUTION CODES: Introduction, Matrix description of Linear Block codes, Error detection and error correction capabilities of Linear block codes, Hamming codes, Binary cyclic codes, Algebraic structure, encoding, syndrome calculation, BCH Codes.

Convolution Codes: Introduction, encoding of convolution codes, Graphical approach: state, tree and trellis diagram.

UNIT VI DATA COMMUNICATION FUNDAMENTALS: Introduction, History, Network Architecture, Protocols & Standards, Standards Organizations for Data Communications, Layered Network Architecture.

UNIT VII OSI REFERENCE MODEL: Introduction, Data Communication Circuits, Data Communication Networks, Data Communication Hardware.

UNIT VIII DATA SWITCHING TECHNIQUES: Circuit switching, Packet switching and Virtual Circuit Switching Concepts, Public switched data Networks, X.25 interface Protocol, ISDN, ATM, B-ISDN

TEXT BOOKS:

1. Simon Haykin, John Wiley - *Digital communications*, 2005
2. H. Taub and D. Schilling - *Principles of Communication Systems*, TMH, 2003

3. W. Tomasi, "*Advanced Electronic Communication Systems* – Prentice Hall International.

REFERENCE BOOKS:

1. John Proakis - *Digital Communications*, TMH, 1983.
2. Singh & Sapre - *Communication Systems Analog & Digital*, TMH, 2004.

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III Year B.Tech. ECE-II Semester

(1G365) ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

UNIT I PRINCIPLES OF MEASUREMENTS: Generalized measurement system. Performance characteristics of Instruments: static calibration. Static characteristics: Accuracy, Precision, Resolution, Sensitivity, Hysteresis, Dead time and Dead Zone. Errors in Measurement, and their statistical analysis. Dynamic calibration. Dynamic characteristics-speed of Response, fidelity, Lag and dynamic error. D'Arsonval galvanometer, PMMC mechanism.

UNIT II AMMETERS, VOLTMETERS & OHM METERS: DC Ammeter, Range extension-Ayrton Shunt. Thermocouple type RF ammeter. DC voltmeters-multirange, range extension, solid state and differential voltmeters.AC voltmeters –multirange, range extension. Ohmmeters-series type, shunt type. Multimeter for voltage, current and resistance measurements. Digital voltmeters (DVMs) –different types.

UNIT III SIGNAL GENERATORS & ANALYZERS: Signal generators-fixed and variable AF oscillators, function generator, pulse, random noise, sweep, and arbitrary waveform generators, their standards, specifications and principles of working (Block diagram approach). Wave analyzers, Harmonic distortion analyzers, Spectrum Analyzers and Logic analyzers.

UNIT IV CATHODE RAY OSCILLOSCOPE: Cathode Ray Tube- Diagram, Electrostatic deflection and CRT features. Vertical deflection system. Horizontal deflection system. Vertical and Horizontal amplifiers. Sweep, trigger pulse, delay line and sync selector circuits.Probes for CRO – active, passive, and attenuator type. Triggered sweep CRO, and Delayed sweep CRO, dual trace and dual beam CRO. Measurement of amplitude, frequency and phase (Lissajous method).

UNIT V SPECIAL OSCILLOSCOPES: Sampling oscilloscope, storage oscilloscope, digital storage oscilloscope and digital read out oscilloscope. Standard specifications of CRO. Frequency counter, time and period measurement. Digital Multimeter.

UNIT VI DC & AC BRIDGES: Wheatstone bridge, Kelvin Bridge., errors and precautions in using bridges, AC bridges: Measurement of inductance-Maxwell's bridge, Anderson Bridge. Measurement of capacitance- Schering Bridge. Wein Bridge Q-meter, EMI and EMC, Interference and noise reduction techniques.

UNIT VII SENSORS AND TRANSDUCERS: Classification. Measurement of displacement (Resistance, capacitance, inductance; LVDT) Force (strain gauges) Pressure (piezoelectric transducers) Temperature (resistance thermometers, thermocouples, and thermistors), Velocity, Acceleration, Vibration, pH measurement Signal Conditioning Circuits.

UNIT VIII: Data Acquisition System, Analogue and digital data recording techniques, strip chart and XY recording methods .Over view of PC Based instrumentation. Bus standards for measuring instruments (GPIB, RS232, USB).

TEXT BOOKS:

1. H.S.Kalsi, *Electronic instrumentation*, second edition, Tata McGraw Hill, 2004.
2. A.D. Helfrick and W.D. Cooper, *Modern Electronic Instrumentation and Measurement Techniques* –PHI, 5th Edition, 2002.

REFERENCE BOOKS:

1. A.K.Sawhney, A Course in electrical and electronic measurements and instrumentation, Dhanpat Rai & Co publishers.
2. K. Lal Kishore, *Electronic Measurements & Instrumentations*, Pearson Education - 2005.

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III Year B.Tech. ECE-II Semester

(1GA62) MANAGEMENT SCIENCE

UNIT I MANAGEMENT AND ORGANISATION STRUCTURE: Meaning, Nature, Importance and Functions of Management-Taylor's Scientific Management- Fayol's Principles of Management- Systems Approach to Management- Need of Organisation Structure -Types of Organisation Structure (Line, Line and Staff, Functional and Matrix Organisations) Its Merits, Demerits and Relevance.

UNIT II OPERATIONS MANAGEMENT: Plant Location and Layout - Methods of Production (Job, Batch and Mass Production)- Work Study - Statistical Quality Control: X Chart, R Chart, C and P Chart, (Simple Problems) Objectives of Inventory Management- Need for Inventory Control-Method of Inventory Management : EOQ, ABC Analysis- Purchase Procedure and Stores Management.

UNIT III MARKETING MANAGEMENT: Core Concepts and Functions of Marketing - Market Segmentation and Targeting – Marketing Mix: Product Levels -Product Life Cycle - New Product Development Process – Channels of Distribution - Marketing Communication - Consumer Protection Act 1986.

UNIT IV HUMAN RESOURCES MANAGEMENT (HRM): Concepts Of HRM- 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 - Meeting Competitive Challenges Through HRM Practices.

UNIT V PROJECT MANAGEMENT (PERT/CPM): Network Drawing - Programme Evaluation and Review Technique (PERT) - Critical Path Method (CPM) - Probability of Completing The Project Within Given Time - Project Crashing (Simple Problems).

UNIT – VI STRATEGIC MANAGEMENT: Mission, Goals, Objectives, Policy, Strategy, Programmes, Elements of Corporate Planning Process, Environmental Scanning, Value Chain Analysis, SWOT Analysis, Steps In Strategy Formulation and Implementation.

UNIT VII ADVANCES IN MANAGEMENT PRACTICES: Basic Concepts and Overview of Management Information System (MIS), Enterprise Resource Planning (ERP), Value Analysis, Just –In-Time (JIT), Total Quality Management (TQM) and Supply Chain Management.

UNIT VIII MANAGEMENT ETHICS AND SOCIAL RESPONSIBILITY: Overview of Ethics-Nature And Objectives of Ethics - Relationship Between Ethics and an Organisation - Normative Ethical Theories (Egoism, Utilitarianism and Altruism) Characteristics of an Ethical Organisation- Ethical Issues In Operations Management, Human Resource Management and Information Technology.

TEXT BOOKS:

1. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004.
2. Shridhara Bhat, Production and operation management, HPH.
3. Kotler Philip & Keller Kevin Lane: Marketing Management 12/e, PHI, 2005.
4. Personnel and Human Resource Management , HPH
5. Thomson Strickland :Strategic Management,TMH,2005
6. Business Ethics – An Indian perspective, Fernando, Pearson Education, 2009.

REFERENCE BOOKS:

1. Harnold Koontz, Cyril 'O' Donnell, Essentials of Management, Tata McGraw Hill, New Delhi, 1979.
2. Human Resource Management, Dessler Gary, 10th Edition, Pearson/Prentice Hall of India 2006.
3. Marketing Management, V.S. Ramaswamy and S. Namakumari, 4/e McMillan, 2010.
4. Production, Planning and Control Text and Cases, S K Mukhopadhyay, PHI, New Delhi. 2009
5. Perspectives in Business Ethics , Laura P Hartman , Tata McGraw Hill
6. Business Policy and Strategic Management, Kazmi, 2/e, TMH.

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-II Semester

(1GC62) SOFT SKILLS – II
(Common to ECE and EEE)

ENGLISH FOR COMPETITIVE EXAMINATIONS

CORRECT ENGLISH USAGE: Articles – Prepositions – Tenses – Voice – Error spotting and correcting – Sentence improvement

VOCABULARY: Synonyms – Antonyms – Analogy – Confusable Words

ENGLISH PROFICIENCY: One-word substitutions – Idioms and Phrases – Homonyms – Spellings

LOGIC-BASED ENGLISH LANGUAGE: Rearrangement of jumbled words and jumbled sentences – word pairs – sentence completion

COMPREHENSION ABILITY: Reading comprehension – Cloze tests

REFERENCE BOOKS:

1. R. S. Agarwal, "*Objective English*", S. Chand Publishers
2. Hari Prasad, "*Objective English for Competitive Exams*", TMH.
3. Collins Cobuild, "*English Guides: Confusable Words*"

ANNAMACHARYA INSTITUTE OF TECHNOLOGY & SCIENCES::RAJAMPET
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III Year B.Tech. ECE-II Semester

(1G367) ANALOG AND DIGITAL COMMUNICATIONS LAB

NOTE: MINIMUM OF 5 EXPERIMENTS IN EACH CYCLE

CYCLE 1: ANALOG COMMUNICATION EXPERIMENTS

1. Amplitude Modulation& Demodulation
2. Frequency Modulation & Demodulation
3. Characteristics of Mixer
4. Pre-Emphasis and De- Emphasis
5. Pulse Amplitude Modulation& Demodulation
6. Pulse Width Modulation& Demodulation
7. Pulse Position Modulation& Demodulation

CYCLE 2: DIGITAL COMMUNICATION EXPERIMENTS

1. Sampling Theorem
2. Pulse Code Modulation and Demodulation
3. Delta Modulation
4. Time Division Multiplexing
5. FSK Modulation and Demodulation
6. PSK Modulation and Demodulation
7. DPSK Modulation & Demodulation

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III Year B.Tech. ECE-II Semester

(1G368) MICRO PROCESSORS & INTERFACING LAB

1. Arithmetic operations
   a) Series of n bytes/words addition
   b) Multi byte Addition and Subtraction
   c) 8/ 16 bit Multiplication and Division
   d) Signed Arithmetic operations
   e) ASCII – arithmetic operation.
   f) Addition of two, 4 digit BCD numbers
2. Logical Operations
   a) Code conversion – BCD ⇔ ASCII, BCD ⇔HEX.
   b) Number of 1's and 0's in a given word.
   c) Packed BCD to unpacked BCD using shift instructions
3. String Operations
   a) Relocate a string of N words/bytes.
   b) Reverse String.
   c) Bubble Sort
   d) Length of the String
   e) String Insertion
   f) String Deletion
   g) String comparison
   h) Scanning a byte/ word.
4. Write near procedure for
   a) Factorial of a given number
   b) Largest/smallest number in an N number of given words.
5. Interfacing with 8255 PPI
   a) DAC Interfacing: Saw tooth, Triangular, Staircase, sinusoidal and square wave generation in BSR mode.
   b) Stepper Motor Interfacing: Rotation in Clock wise and Anti-clock wise direction.
6. 8259 – Interrupt Controller.
7. 8279 – Keyboard /Display controller.
8. 8251 - USART Interfacing

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IV Year B.Tech. ECE-I Semester

(1G371) OPTICAL COMMUNICATION

UNIT I INTRODUCTION AND OPTICAL FIBER WAVEGUIDES: historical Development, The General System, Advantages of Optical Fiber Communications, Ray Theory transmission, Electromagnetic mode theory for Optical Propagation, Cylindrical Fiber.

UNIT II FIBER TYPES AND MATERIALS: Single mode fibers, Fiber Materials - Fiber Fabrication, Mechanical Properties of Fibers, Fiber Optic Cables.

UNIT III FIBER LOSSES: Attenuation, Material Absorption Losses in Silica Glass Fibers, Linear Scattering Losses, Fiber Bend Loss, Dispersion, Chromatic dispersion, Intermodal dispersion, Overall fiber dispersion, Polarization. Fiber alignment and joint loss, Fiber Splices, Fiber Connectors, Fiber Couplers, Optical Isolators and Circulators.

UNIT IV OPTICAL SOURCES: Light Emitting Diodes (LEDs): LED Structures, Light Source Materials, Quantum efficiency and LED Power, Modulation of LED. LASER Diodes-Laser Diode Modes and Threshold Conditions, Laser Diode Rate Equations, External Quantum Efficiencies, Resonant Frequencies.

UNIT V POWER LAUNCHING AND COUPLING: Source to Fiber Power Launching, Lensing schemes for Coupling Improvement, fiber-to-fiber Joints, LED coupling tot single mode fibers, semiconductor optical amplifiers, EDFA.

UNIT VI PHOTO DETECTORS: Physical principles of photo diodes, photo detector noise, detector response time, avalanche multiplication noise, structures for InGaAs APDs, temperature effect on avalanche gain, comparison of photo detectors.

UNIT VII ANALOG AND DIGITAL LINKS: Analog links: Over-view of analog links, carrier-to-noise ratio, multichannel transmission techniques, RF over fiber, radio over fiber links.

Digital Links: Point-to-point links, power penalties, error control.

UNIT VIII WDM CONCEPTS AND COMPONENTS: Over-view, Passive optical couplers, Isolators & circulators, Fiber grating filters, dielectric thin film filters, Phased array based devices, Diffraction gratings, Active optical components, tunable light sources.

TEXT BOOKS:

1. Gerd keiser, *Optical fiber communications*, McGraw Hill International Edition, 4th Edition, 2010.
2. John M. Senior, Optical fiber communications, PHI, 3rd Edition, 2010.

REFERENCE BOOKS:

1. Max Ming-Kang Liu, *Principles and Applications of Optical Communications*, TMH, 2010.
2. S.C.Gupta, *Text book on optical fiber communication and its applications*, PHI, 2005.
3. Satish Kumar, *Fundamentals of Optical Fiber communications*, PHI, 2009.

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IV Year B.Tech. ECE-I Semester

(1G478) COMPUTER NETWORKS

UNIT I INTRODUCTION: Network Hardware, Network Software, References Models.
The Physical Layer-The Theoretical Basis for Data Communication Guided Transmission Media, Communication Satellites, The public Switched Telephone Network- The Local Loop: Modern ADSL, and wireless, Trunks and Multiplexing, Switching.

UNIT II THE DATA LINK LAYER: Data link Layer Design Issues, Elementary Data Link Protocols, Sliding Window Protocols.

UNIT III THE MEDIUM ACCESS CONTROL SUB LAYER: The Channel allocation Problem, 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, Congestion Control Algorithms.

UNIT V: Internetworking, The Network Layer in the Internet.

UNIT VI THE TRANSPORT LAYER: The Transport Service, Elements of Transport Protocols, The Internet Transport Protocols: UDP, TCP.

UNTI VII THE APPLICATION LAYER: DNS-The Domain Name System, Electronic Mail. The World Wide Web, Multimedia.

UNTI VIII NETWORK SECURITY: Cryptography, Symmetric-Key Algorithms, Public-Key Algorithms, Digital Signatures.

TEXT BOOKS:

1. Andrew S. Tanenbaum, *Computer Networks*, Pearson Education, Fourth Edition.

REFERENCE BOOKS:

1. Michael A. Gallo, William M. Hancock, *Computer Communications and Networking Technologies,* Cengage Learning.
2. Natalia Olifer, Victor Olifer*, Computer Networks: Principles, Technologies and Protocols for Network Design*, Wiley India.
3. Behrouz A. Forouzan, *Data Communications and Networking*, Tata McGraw Hill, Fourth Edition.
4. W.A.Shay, *Understanding Communications and Networks*, Cengage Learning, Third Edition.
5. Nader F. Mir, *Computer and Communication Networks*, Pearson Education
6. James F.Kurose, K.W.Ross, *Computer Networking: A Top-Down Approach Featuring the Internet*, Pearson Education, Third Edition.
7. G.S.Hura and M.Singhal, *Data and Computer Communications*, CRC Press, Taylor and Francis Group.

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IV Year B.Tech. ECE-I Semester

(1G372) DIGITAL SIGNAL PROCESSING
(Common to ECE and EEE)

UNIT I INTRODUCTION: Introduction to digital signal processing: Discrete time signals and sequences, linear shift invariant systems, stability and causality, linear constant coefficient difference equations. Frequency domain representation of discrete time signals and systems.

UNIT II 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 III FAST FOURIER TRANSFORMS: Fast Fourier transforms (FFT)-Radix2 decimation in time and decimation in frequency FFT algorithms, inverse FFT and FFT for composite N.

UNIT IV 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, transposed forms, basic structures of FIR systems, system function.

UNIT V IIR DIGITAL FILTERS: Analog filter approximations-Butterworth and chebyshev, design of IIR digital filters from analog filters, design examples: analog-digital transformations, Illustrative Problems.

UNIT VI 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 VII 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.

UNIT VIII APPLICATIONS OF DIGITAL SIGNAL PROCESSING: Spectral analysis of nonstationary Signals, Musical Sound processing, signal Compression, Transmultiplexers, Discrete Multitone Transmission of digital data.

TEXT BOOKS:

1. John G. Proakis, Dimitris G. Manolakis, *Digital signal processing, principles, Algorithms and applications*. Pearson Education/PHI, 2007, 4th ed.
2. Sanjit K Mitra, *Digital signal processing - A computer based approach*. Tata Mcgraw Hill, 2009, 3rd ed.

REFERENCE BOOKS:

1. Andreas Antoniou, *Digital signal processing*. Tata McGraw Hill, 2006.
2. A.V. Oppenheim and R.W. Schaffer, *Discrete Time Signal Processing*. PHI, 2nd ed.

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IV Year B.Tech. ECE-I Semester

(1G373) DIGITAL DESIGN THROUGH VERILOG HDL

UNIT I INTRODUCTION TO VERILOG: Verilog as HDL, Levels of design description, concurrency, simulation and synthesis, functional verification, system tasks, programming language interface(PLI), module, simulation and synthesis tools, test benches.
Language Constructs And Conventions-Introduction, keywords, identifiers, whitespace characters, comments, numbers, strings, logic values, strengths, data types, scalars and vectors, parameters, memory, operators, system tasks, exercises.

UNIT II GATE LEVEL MODELING: Introduction, AND gate primitive, module structure, other gate primitives, illustrative examples, tristate gates, array of instances of primitives, additional examples, design of Flip flops with gate primitives, delays, strengths and contention resolution, net types, design of basic circuits, exercises.

UNIT III BEHAVIORAL MODELING: Introduction, operations and assignments, functional Bifurcation, initial construct, always construct, examples, assignments with delays, wait construct, multiple always blocks, designs at behavioral level, blocking and non-blocking assignments, the case statement, simulation flow, if and if else constructs, assign-De assign construct, repeat construct, FOR loop, the disable construct, While loop, Forever loop, parallel blocks, force-release construct, event.

UNIT IV MODELING AT DATAFLOW LEVEL: Introduction, continuous assignment structures, delays and continuous assignments, assignment to vectors, operators.
Switch Level Modeling-Introduction, basic transistor switches, CMOS switch, Bidirectional gates, time delays with switch primitives, instantiations with strengths and delays, strength contention with trireg nets, exercises.

UNIT V: SYSTEM TASKS, FUNCTIONS AND COMPILER DIRECTIVES- Introduction, parameters, path delays, module parameters, system tasks and functions, file – based tasks and Functions, Compiler Directives, Hierarchical Access, General Observations, exercises.
Functions, Tasks, And User-Defined Primitives- Introduction, Function, Tasks, User-Defined Primitives (UDP), FSM Design (Moore and Mealy Machines).
UNIT VI DIGITAL DESIGN WITH SM CHARTS: State Machine Charts, Derivation of SM Charts, Realization of SM Charts, Implementation of the Dice Game, Alternative realizations for SM Charts using Microprogramming, Linked State Machines.

UNIT VII DESIGNING WITH PROGRAMMABLE GATE ARRAYS AND COMPLEX PROGRAMMABLE LOGIC DEVICES: Xilinx 3000 Series FPGAs, Designing with FPGAs, Using a One-Hot State Assignment, Altera Complex Programmable Logic Devices (CPLDs), Altera FLEX 10K Series CPLDs.

UNIT VIII VERILOG MODELS: Static RAM Memory, A simplified 486 Bus Model, Interfacing Memory to a Microprocessor Bus, UART Design, Design of Microcontroller CPU.

TEXT BOOKS:

1. T.R. Padmanabhan and B. Bala Tripura Sundari, *Design through Verilog HDL*, WSE, IEEE Press, 2004.
2. J. Bhasker, A Verilog Primier, BSP, 2003.

REFERENCE BOOKS:

1. Stephen. Brown and Zvonko Vranesic, *Fundamentals of Logic Design with Verilog*, TMH, 2005.
2. Michael D. Ciletti, *Advanced Digital Design with Verilog HDL*, PHI, 2005.

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IV Year B.Tech. ECE-I Semester

(1G374) EMBEDDED SYSTEMS

UNIT I INTRODUCTION TO EMBEDDED SYSTEMS: Embedded System – Definition, Application Areas, and Categories. Overview of embedded system architecture, specialities: reliability, performance, power consumption cost, size, user interface, software upgradation capability, recent trends: processor, power, memory, operating system, communication interface, programming languages, development tools, programmable hardware.

UNIT II ARCHITECTURE OF EMBEDDED SYSTEMS: Hardware Architecture – CPU, Memory, Clock Circuitry, Watch dog Timer/Reset Circuitry, chip select, I/O devices, Debug Port, Communication Interfaces, Power supply Unit. Software Architecture – Services provided by an operating System, Architecture and categories of Embedded Operating Systems, Application Software, Communication software, Process of generating Executable image, Development/Testing tools.

UNIT III 8051 MICROCONTROLLER: Introduction, Architecture, Register Organization, Internal and External Memory, Pin diagram, I/O port structure, Addressing modes, Instruction Set, simple programs.

UNIT IV ON-CHIP PERIPHERALS: 8051 Interrupt Structure, Timer/Counter features, modes and programming, Serial Communication Interface.

UNIT V APPLICATIONS: Interfacing with switches, display – LED, seven segment displays, LCD. Keyboard interfacing, D/A and A/D interfacing, Stepper motor interfacing, Handling External Interrupts.

UNIT VI COMMUNICATION INTERFACES: Need for Communication interface, RS232/UART, RS 422/RS 485, USB, Infrared, IEEE 1394 fire wire, IEEE 802.11, Blue tooth, I^2C and CAN Bus.

UNIT VII REAL TIME OPERATING SYSTEM – I: Architecture of Kernel, Tasks and Task Scheduler, Interrupt Service Routines, Inter process Communication– Semaphores, mutex, message queues, mailboxes, pipes, signals, event registers and timers. Priority Inversion Problem.

UNIT VIII REAL TIME OPERATING SYSTEM – II: Off the Shelf Operating Systems, Embedded Operating Systems, Real Time Operating Systems, And Handheld Operating Systems.

TEXT BOOKS:

1. K.V.K.K. Prasad, *Embedded/ Real Time Systems*, Dreamtech press.
2. Kenneth J Ayala*, The 8051 Microcontroller*, Thomson Press, 3rd edition.

REFERENCE BOOKS:

1. Wyene Wolf, *Computers and Components*, Elseveir.
2. Raj Kamal, *Embedded Systems*, 2nd edition, TMH, 2008.

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IV Year B.Tech. ECE-I Semester

(1G47D) OBJECT ORIENTED PROGRAMMING
(ELECTIVE – I)

UNIT I OBJECT ORIENTED THINKING: Need for oop paradigm, A way of viewing world – Agents, responsibility, messages, methods, classes and instances, class hierarchies (Inheritance), method binding, overriding and exceptions, summary of oop concepts.
Java Basics- History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and costing, simple java program

UNIT II CLASSES AND OBJECTS: concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, string handling.

UNIT III INHERITANCE: Hierarchical abstractions, Base class object, subclass, subtype, substitutability, forms of inheritance- specialization, specification, construction, extension, limitation, combination, benefits of inheritance, costs of inheritance. Member access rules, super uses, using final with inheritance, polymorphism- method overriding, abstract classes.

UNIT IV PACKAGES AND INTERFACES: Defining, Creating and Accessing a Package, Understanding CLASSPATH, importing packages, differences between classes and interfaces, defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces.
Exploring Packages: Java.io, java.util.java.net

UNIT V EXCEPTION HANDLING AND MULTITHREADING: Concepts of exception handling, benefits of exception handling, Termination or presumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. Differences between multi threading and multitasking, thread life cycle, creating threads, synchronizing threads, daemon threads, thread groups.

UNIT VI EVENT HANDLING: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes, inner classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels – scrollpane, dialogs, menubar, graphics, layout manager – layout manager types – boarder, grid, flow, card and grib bag.

UNIT VII APPLETS: Concepts of Applets, differences between applets and applications, life cycle of an applet, types of applets, creating applets, passing parameters to applets.
SWING-Introduction, limitations of AWT, MVC architecture, components, containers, exploring swing- JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

UNIT VIII NETWORKING: Basics of network programming, addresses, ports, sockets, simple client server program, multiple clients.

TEXT BOOKS:

1. Herbert Scheldt, *Java: the complete reference*, TMH, 7th editon.
2. T. Budd*, Understanding OOP with Java, updated edition*, Pearson education.

REFERENCE BOOKS:

1. J.Nino and F.A. Hosch, *An Introduction to programming and OO design using Java,* John wiley & sons.
2. T. Budd, *An Introduction to OOP*, pearson education, second edition.
3. Y. Daniel Liang, *Introduction to Java programming*, pearson education*,* 6th edition.
4. R.A. Johnson, *An introduction to Java programming and object oriented application development*, Thomson.
5. Cay.S.Horstmann and Gary Cornell, *Core Java 2, Vol 1, Fundamentals,* Pearson Education, seventh Edition.
6. Cay.S.Horstmann and Gary Cornell, *Core Java 2, Vol 2, Advanced Features*, Pearson Education, Seventh Edition.
7. P. Radha Krishna, *Object Oriented Programming through Java*, University Press.

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IV Year B.Tech. ECE-I Semester

(1G375) TELEVISION ENGINEERING
(ELECTIVE – I)

UNIT I INTRODUCTION: Television Pictures: Geometric form and aspect ratio, image continuity, interlaced scanning, picture resolution, Composite video signal: Horizontal and vertical sync, scanning sequence. Colour signal generation and Encoding: Perception of brightness and colours, additive colour mixing, video signals for colours, luminance signal, colour difference signals, encoding of colour difference signals, formation of chrominance signals, PAL encoder.

UNIT II TV SIGNAL TRANSMISSION AND PROPAGATION: Picture signal transmission, positive and negative modulation, VSB transmission, sound signal transmission, standard channel BW, TV transmitter, TV signal propagation, interference, TV broadcast channels, TV transmission Antennas, Receiver Antennas.

UNIT III TV CAMERAS: Camera tube types, Vidicon, Silicon Diode Array Vidicon, Monochrome TV camera, color camera. CCD Image Sensors.

UNIT IV PICTURE TUBES: Monochromatic Picture tube, Electrostatic focussing, Beam deflection, picture tube characteristics and specifications, colour picture tubes. TV Standards: American 525 line B&W TV system, NTSC colour system, 625-line monochrome system, PAL colour system, TV standards.

UNIT V MONOCHROME TV RECEIVER: RF tuner, IF subsystem, video amplifier, sound section, sync separation and processing, deflection circuits, scanning circuits. PAL-D Colour Receiver: Electron tuners, IF subsystem, Y-signal channel, Chroma decoder, Separation of U & V Colour Phasors, synchronous demodulators, Subcarrier generation, raster circuits, AFC.

UNIT VI VISION IF SUBSYSTEM: AGC, noise cancellation, video and intercarrier sound signal detection, vision IF subsystem of Black and White receivers, Colour receiver IF subsystem. Receiver sound system: FM detection, FM Sound detectors, typical applications. TV Receiver Tuners: Tuner operation, VHF and UHF tuners, digital tuning techniques, remote control of receiver functions.

UNIT VII COLOUR SIGNAL DECODING: PAL – D decoder, chroma signal amplifiers, separation of U and V signals, Color burst separation, Burst phase discriminator, ACC amplifier, Reference oscillator, Indent and colour killer circuits, RO phase shift and 180o PAL–SWITCH circuitry, U & V demodulators, Colour signal mixing.

UNIT VIII ADVANCED TELIVISION SYSTEMS: DIGITAL TV Digital Satellite TV, Direct to Home Satellite TV, Digital TV Receiver, Digital Terrestrial TV,EDTV,HDTV,LCD&Plasma screen TV, Projection TV.

TEXT BOOKS:

1. R.R. Gulati, *Modern Television Practice – Principles, Technology and Service*, New Age International Publication, 2002.
2. R.R. Gulati, *Monochrome and Colour TV*, New Age International Publication, 2002.

REFERENCE BOOKS:

1. S.P. Bali, *Colour Television Theory and Practice*, TMH, 1994.
2. A.M. Dhake, Television and Video Engineering, 2nd Edition.
3. B. Grob and C.E. Herndon, *Basic Television and Video Systems*, McGraw Hill, 1999.

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IV Year B.Tech. ECE-I Semester

(1G376) RADAR ENGINEERING
(ELECTIVE – I)

UNIT I RADAR PRINCIPLES: Introduction, Radar Block Diagram and Operation, Maximum Unambiguous Range, Radar waveforms, Radar Frequencies and Applications, simple form of Radar Equation.

UNIT II RADAR EQUATION: Prediction of Range Performance, Minimum Detectable Signal, Receiver Noise, and SNR, Integration of Radar Pulses, Radar Cross Section of Targets (simple targets - sphere, cone-sphere), cross section fluctuations, Transmitter Power, PRF and Range Ambiguities, Radar equation for stand- off jamming, bistatic radar equation, beacon equation.

UNIT III CW AND FREQUENCY MODULATED RADAR: Doppler Effect, CW Radar – Block Diagram, Isolation between Transmitter and Receiver, Non-zero IF Receiver, Receiver Bandwidth Requirements, Applications of CW radar.

UNIT IV: FM-CW Radar, Range and Doppler Measurement, Block Diagram and Characteristics (Approaching/ Receding Targets), FM-CW altimeter, Multiple Frequency CW Radar.

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

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

UNIT VII DETECTION OF RADAR SIGNALS IN NOISE: Introduction, Matched Filter Receiver – Response Characteristics and Derivation, Correlation Function and Cross-correlation Receiver, Efficiency of Non-matched Filters, Matched Filter with Non-white Noise, Noise Figure and Noise Temperature.

UNIT VIII RECEIVERS AND DISPLAYS: Receiver description and functions, super heterodyne principles, Mixers, Displays – types. Duplexers – Branch type and Balanced type, Circulators as Duplexers, Phased Array Antennas, Series versus Parallel Feeds, Applications, Advantages and Limitations.

TEXT BOOKS:

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

2. Byron Edde, *Radar Principals, Technology, Applications,* Pearson Education, 2004.

REFERENCE BOOKS:

1. Peebles, Jr., *Radar Principles,* P.Z.Wiley, New York, 1998.

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IV Year B.Tech. ECE-I Semester

(1G377) NANOELECTRONICS
(ELECTIVE – I)

UNIT I INTRODUCTION: Nano- The beginning – Electron Microscopies – Scanning probe Microscopies – Optical Microscopies for nanoscience and technology – Other kinds of microscopies.

UNIT II CARBON NANOTUBES (CNTs): Synthesis and purification – Filling of nanotubes – Mechanism of growth – electronic structure – transport, mechanical and physical properties and applications.

UNIT III MODELS OF SEMICONDUCTOR QUANTUM WELLS, QUANTUM WIRES, AND QUANTUM DOTS: Semiconductor Heterostructures and quantum wells – Quantum wires and nanowires – Quantum dots and nanoparticles – Fabrication Techniques for Nanostructures: Lithography, Nanoimprint lithography – split-gate technology, self-assembly.

UNIT IV QUANTUM ELECTRONICS: Quantum Electronic Devices – Short channel MOS Transistor, split-gate transistor, Electron-wave transistor, Electron-spin transistor, quantum cellular automata, quantum dot array.

UNIT V TUNNELING DEVICES: Tunneling effect and Tunneling diode, three terminal RTDs Technology of RTD.
Digital Circuit Design Based On RTDS: Memory application, basic logic circuits, dynamic logic gates.

UNIT VI SINGLE ELECTRON TRANSISTOR (SET): Principle of SET – Coulomb blockade, performance of SET, technology, SET circuit design – wiring and drivers, logic and memory circuits, SET adder, Comparison between FET and SET circuit design.

UNIT VII LIMITS OF INTEGRATED ELECTRONICS: Energy supply and heat dissipation – Parameter spread as limiting effect – Limits due to thermal particle motion – The Debye length – Reliability as limiting factor – Physical limits.

UNIT VIII COMPLEX INTEGRATED SYSTEMS AND THEIR PROPERTIES: Nanosystems as information processing machines – system design and its interfaces – Evolutionary Hardware – Requirements of Nanosystems.

TEXT BOOKS:

1. T. Pradeep, '*Nano: The Essentials*", TMH Edition (2008)
2. K. Goser, P. Glosekotter, J. Dienstuhl, '*Nanoelectronics and Nanosystems',* Springer Edition (2004)

REFERENCE BOOKS:

1. George W. Hanson, '*Fundamentals of Nanoelectronics'*, Pearson Education (2009)

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IV Year B.Tech. ECE-I Semester

(1G379) MICROWAVE AND OPTICAL COMMUNICATION LAB

MINIMUM TWELVE EXPERIMENTS TO BE CONDUCTED:

Part – A (Any 7 Experiments):

1. Reflex Klystron Characteristics.
2. Gunn Diode Characteristics.
3. Attenuation Measurement.
4. Directional Coupler Characteristics.
5. VSWR Measurement.
6. Impedance Measurement.
7. Waveguide parameters measurement.
8. Scattering parameters of Directional Coupler.
9. Scattering parameters of Magic Tee.

Part – B (Any 5 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).

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IV Year B.Tech. ECE-I Semester

(1G37A) DSP AND EMBEDDED SYSTEMS LAB

I. DSP LAB: (Any six of the following)

1. To study the architecture of DSP chips – TMS 320C 5X/6X Instructions.
2. To verify linear convolution.
3. To verify the circular convolution.
4. To design FIR filter (LP/HP) using windowing technique
    a) Using rectangular window
    b) Using triangular window
    c) Using Kaiser window
5. To Implement IIR filter (LP/HP) on DSP Processors.
6. N-point FFT algorithm.
7. MATLAB program to find frequency response of analog LP/HP filters.
8. To compute power density spectrum of a sequence.

II. EMBEDDED SYSTEMS LAB: (Any six of the following)

1. Switch and LED Interfacing
2. LCD Interfacing
3. Serial Transmission
4. Serial Reception
5. Key Pad Interfacing
6. Analog Interfacing
7. Sorting RTOS
8. Elevator Interfacing

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IV Year B.Tech. ECE-II Semester

(1G381) CELLULAR AND MOBILE COMMUNICATIONS

UNIT I CELLULAR MOBILE RADIO SYSTEMS: Introduction to Cellular Mobile system, performance criteria, uniqueness of mobile radio environment, operation of cellular systems, Hexagonal shaped cells, Analog and Digital Cellular systems.

UNIT II ELEMENTS OF CELLULAR 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, consideration of the components of cellular system.

UNIT III INTERFERENCE: Introduction to Co-channel interference, real time co-channel interference, Co-channel measurement, design of Antenna system, Antenna parameters and their effects, diversity receiver, non-co-channel interference-different types.

UNIT IV 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, and 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 V CELL SITE AND MOBILE ANTENNAS: Sum and difference patterns and their synthesis, Omni directional antennas, directional antennas for interference reduction, space diversity antennas, umbrella pattern antennas, minimum separation of cell site antennas, high gain antennas.

UNIT VI FREQUENCY MANAGEMENT AND CHANNEL ASSIGNMENT: Numbering and grouping, setup access and paging channels channel assignments to cell sites and mobile units, channel sharing and borrowing, sectorization, overlaid cells, non fixed channel assignment.

UNIT VII HANDOFF: Handoff, dropped calls and cell splitting, types of handoff, handoff invitation, delaying handoff, forced handoff, mobile assigned handoff. Intersystem handoff, cell splitting, micro cells, vehicle locating methods, dropped call rates and their evaluation.

UNIT VIII DIGITAL CELLULAR NETWORKS: GSM architecture, GSM channels, multiplex access scheme, TDMA, CDMA.

TEXT BOOKS:

1. W .C. Y. Lee, *Mobile cellular telecommunications*, Tata Mc-Graw Hill, 2nd Edition, 2006.
2. Theodore. S. Rappaport, *Wireless communications*, Pearson Education, 2nd Edition, 2002.

REFERENCE BOOKS:

1. Gordon L. Stuber, *Principles of Mobile communications*, Springer International 2nd Edition, 2007.
2. Lee, *Wireless and Mobile Communications*, Mc Graw Hills, 3rd Edition, 2006.

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IV Year B.Tech. ECE-II Semester

(1G382) DIGITAL IMAGE PROCESSING

UNIT I DIGITAL IMAGE FUNDAMENTALS: Digital Image through scanner, digital camera. Concept of gray levels. Gray level to binary image conversion. Sampling and quantization, Relationship between pixels. Imaging Geometry.

UNIT II IMAGE TRANSFORMS: 2-D FFT, Properties. Walsh transform, Hadamard Transform, Discrete cosine Transform, Haar transform, Slant transform, Hotelling transform.

UNIT III IMAGE ENHANCEMENT: Point processing. Histogram processing- Histogram equalization, Adaptive Histogram Equalization, Spatial filtering.

UNIT IV IMAGE SMOOTHING AND SHARPENING: Enhancement in frequency domain, Image smoothing, Image sharpening.

UNIT V COLOUR IMAGE PROCESSING: Pseudo colour image processing, full colour image processing.

UNIT VI IMAGE RESTORATION: Degradation model, Algebraic approach to restoration, Inverse filtering, Least mean square filters, Constrained Least Squares Restoration, Interactive Restoration.

UNIT VII IMAGE SEGMENTATION: Detection of discontinuities. Edge linking and boundary detection, Thresholding, Region oriented segmentation.

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

TEXT BOOKS:

1. R.C. Gonzalez & R.E. Woods, *Digital Image processing*, Addison Wesley/ Pearson education, 2nd Edition, 2002.

REFERENCE BOOKS:

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

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IV Year B.Tech. ECE-II Semester

(1G383) DSP PROCESSORS & ARCHITECTURES
(ELECTIVE – II)

UNIT I INTRODUCTION TO PROGRAMMABLE DSPs: Multiplier & Multiplier accumulator, Modified bus structures & memory access schemes in P – DSPs, Multiple access memory, Multi ported memory, VLIW architecture, Pipelining, Special addressing modes in P–DSPs, On chip peripherals.

UNIT II COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATION: 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, Memory space, Program Control, instructions, Programming, On-Chip Peripherals, Interrupts and Pipeline Operation of TMS320C54XX Processors.

UNIT V IMPLEMENTATION OF BASIC DSP ALGORITHMS: The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing.

UNIT VI 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 VII INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSPs: Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA). A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

UNIT VIII RECENT TRENDS IN DSP SYSTEM DESIGN: An overview of the application nodes on DSP systems, An overview of open multimedia applications platform (OMAP), An Introduction to FPGA, Design flow for an FPGA based system design, CAD tools for FPGA based system design, soft core processors, FPGA based DSP system design, New algorithms for Implementation of filters in VLSI, Distributed arithmetic algorithm, Case studies, Comparison of the performances of the systems designed using FPGAs and digital signals processors.

TEXT BOOKS:

1. Avtar Singh and S. Srinivasan, *Digital Signal Processing,* Thomson Publications, 2004.
2. B. Venkata Ramani and M. Bhaskar, *Digital Signal Processors, Architecture, Programming and Applications,* TMH, 2004.

REFERENCE BOOKS:

1. Jonathan Stein, *Digital Signal Processing*, John Wiley, 2005.
2. Lapsley et al. S. Chand & Co, *DSP Processor Fundamentals, Architectures & Features*, 2000.

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IV Year B.Tech. ECE-II Semester

(1G48A) HUMAN COMPUTER INTERFACE
(ELECTIVE – II)

UNIT I INTRODUCTION: Importance of user Interface - definition, importance of good design. Benefits of good design. A brief history of Screen design.

UNIT II THE GRAPHICAL USER INTERFACE: Popularity of graphics, the concept of direct manipulation, graphical system, Characteristics, Web user – Interface popularity, characteristics- Principles of user interface.

UNIT III DESIGN PROCESS: Human interaction with computers, importance of human characteristics human consideration, Human interaction speeds, understanding business junctions.

UNIT IV SCREEN DESIGNING: Design goals – Screen planning and purpose, organizing screen elements, ordering of screen data and content – screen navigation and flow – Visually pleasing composition – amount of information – focus and emphasis – presentation information simply and meaningfully – information retrieval on web – statistical graphics – Technological consideration in interface design.

UNIT V WINDOWS: New and Navigation schemes selection of window, selection of devices based and screen based controls.

UNIT VI COMPONENTS: Text and messages, Icons and increases – Multimedia, colors, uses problems, choosing colors.

UNIT VII SOFTWARE TOOLS: Specification methods, interface – Building Tools.

UNIT VIII INTERACTION DEVICES: Keyboard and function keys – pointing devices – speech recognition digitization and generation – image and video displays – drivers.

TEXT BOOKS:

1. Wilbert O Galitz, *The essential guide to user interface design*, Wiley DreamaTech.
2. Ben Shneidermann, *Designing the user interface*, Pearson Education Asia, 3rd Edition.

REFERENCE BOOKS:

1. Alan Dix, Janet Fincay, Gre Goryd, Abowd, Russell Bealg, *Human – Computer Interaction*, Pearson.
2. Prece, Rogers, Sharps, *Interaction Design*, Wiley Dreamtech,
3. Soren Lauesen, *User Interface Design*, Pearson Education.

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IV Year B.Tech. ECE-II Semester

(1G384) RELIABILITY ENGINEERING
(ELECTIVE – II)

UNIT I INTROCUTION & BASIC RELIABILITY MODELS: Concepts, terms and definitions, applications, brief history, Reliability function, MTTF, Hazard rate function, Bath tub curve, Conditional Reliability

UNIT II CONSTANT FAILURE RATE MODEL: The exponential Reliability Function, Failure Modes – Failure modes with CFR model, failures on demand, Applications – The two-parameter Exponential distribution – Poisson process – Redundancy and the CFR model

UNIT III TIME DEPENDENT FAILURE MODELS: The weibull distribution – design life, median and mode – The three-parameter weibull – Redundancy with weibull failures – Normal and Lognormal distributions

UNIT IV SERIAL AND PARALLEL SYSTEMS: Serial configuration – Parallel configuration – combined series – Parallel Systems – Minimal cuts and minimal paths – common-mode failures – Three-state devices.

UNIT V FAILURE ANALYSIS: System definition – Identification of failure modes – Determination of cause – Assessment of Effect – Classification of severity – Estimation of probability of occurrence – Computation of criticality Index – Determination of corrective action – System safety and fault tree Analysis.

UNIT VI DESIGN FOR MAINTAINABILITY: Maintenance requirements – design methods – Maintainability prediction – preventive and corrective maintenance.

UNIT VII AVAILABILITY: Inherent, achieved and operational availabilities – Exponential availability model – system availability – Inspection and Repair availability model.

UNIT VIII RELIABILITY TESTING: Product testing – Reliability life testing – Test time calculations – Burn-in testing – Acceptance testing – Accelerated life testing.

TEXT BOOKS:

1. Charles E. Ebeling, '*An introduction to Reliability and Maintainability Engineering*', TMH Edition (2007).
2. Roy Billinton and Ronald N.allan, '*Reliability Evaluation of Engineering systems*', Springer International Edition (2007).

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IV Year B.Tech. ECE-II Semester

(1G48B) NEURAL NETWORKS AND FUZZY LOGIC
(ELECTIVE – II)

UNIT I INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS: Introduction, Biological Neuron, Model of Artificial, Neural network architectures, Characteristics of neural networks , McCulloch-Pitts Model, Types of neuron activation functions learning methods(supervised, unsupervised, Reinforcement), Historical Developments, Applications of Neural Networks.

UNIT II SINGLE LAYER FEED FORWARD NEURAL NETWORKS: Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

UNIT III MULTILAYER FEED FORWARD NEURAL NETWORKS: Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT IV ASSOCIATIVE MEMORIES: Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem.

UNIT V HOPFIELD NETWORKS: Architecture, Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network.

Adaptive Resonance Theory-Introduction, ART1, ART2, Applications

UNIT VI CLASSICAL & FUZZY SETS: Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT VII FUZZY LOGIC SYSTEM COMPONENTS: Fuzzification, Membership value assignment, development of rule base and decision making system, De-fuzzification to crisp sets, De-fuzzification methods.

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

Fuzzy Logic Applications-Fuzzy logic control and Fuzzy classification.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. James A Freeman and Davis Skapura, *Neural Networks*, Pearson Education, 2002.
2. Simon Hakins, *Neural Networks*, Pearson Education
3. C.Eliasmith and CH.Anderson, *Neural Engineering*, PHI

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IV Year B.Tech. ECE-II Semester

(1G385) WIRELESS COMMUNICATION NETWORKS
(ELECTIVE – III)

UNIT I INTRODUCTION TO WIRELESS COMMUNICATIONS: History of Wireless Communications, Wireless Vision, Technical Issues, Current Wireless Systems and comparison, the Wireless Spectrum, wireless standards

UNIT II MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION: Introduction, FDMA, TDMA, Spread Spectrum, Multiple Access, SDMA, Packet radio, Packet radio protocols, CSMA protocols, Reservation protocols.

UNIT III WIRELESS NETWORKING AND DATA SERVICES: Difference between wireless and fixed telephone networks, Development of wireless networks, Traffic routing in wireless networks, Data services, CCS, BISDN and ATM, Signaling System No7.

UNIT IV MOBILE IP AND WIRELESS ACCESS PROTOCOL: Mobile IP Operation of mobile IP, Co-located address, Registration, Tunneling, WAP Architecture, overview, WML scripts, WAP service, WAP session protocol, wireless transaction, Wireless datagram protocol.

UNIT V WIRELESS LAN TECHNOLOGY: Infrared LANs, Spread spectrum LANs, Narrow band microwave LANs, IEEE 802 protocol Architecture, and services, IEEE 802.11 medium access control and physical layer.

UNIT VI BLUE TOOTH: Overview, Radio specification, Base band specification, Links manager specification, Logical link control and adaptation protocol. Introduction to WLL Technology.

UNIT VII MOBILE DATA NETWORKS: Introduction, Data oriented CDPD Network, GPRS and higher data rates, Short messaging service in GSM, Mobile application protocol.

UNIT VIII WIRELESS ATM & HIPER LAN: Introduction, Wireless ATM, HIPERLAN, Adhoc Networking and WPAN.

TEXT BOOKS:

1. Theodore S. Rappaport, *Wireless Communications*, *Principles, Practice,* PHI, 2nd Edition, 2002.
2. William Stallings, *Wireless Communication and Networking*, PHI, 2003.

REFERENCE BOOKS:

1. Kamilo Feher, *Wireless Digital Communications*, PHI, 1999.
2. Kaveh Pah Laven and P. Krishna Murthy, *Principles of Wireless Networks*, Pearson Education, 2002.

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IV Year B.Tech. ECE-II Semester

(1G386) SATELLITE COMMUNICATIONS
(ELECTIVE – III)

UNIT I INTRODUCTION: Origin of satellite communications, Historical background, basic concepts of satellite communications, frequency allocations for satellite services, applications, future trends in satellite communications.

UNIT II ORBITAL MECHANICS AND LAUNCHERS: Orbital Mechanics look angle determination, orbital perturbations, orbit determination, launches and launch vehicles, orbital effects in communication systems performance.

UNIT III SATELLITE SUBSYSTEMS: Attitude and orbital control system, Telemetry, Tracking, command and monitoring, power systems, communication subsystems, satellite antenna equipment reliability and space qualification.

UNIT IV SATELLITE LINK DESIGN: Basic transmission theory, system noise temperature and G/T ratio, design of down links, uplink design, design of satellite links for specified C/N, system design example.

UNIT V MULTIPLE ACCESS: Frequency division multiple access (FDMA) Intermodulation, calculation of C/N, Time Division multiple access (TDMA) frame structure, examples. Satellite switched TDMA onboard processing, DAMA, code division multiple access (CDMA), spread spectrum transmission and reception.

UNIT VI EARTH STATION TECHNOLOGY: Introduction, transmitters, receivers, Antennas, tracking systems, terrestrial interface, primary power test methods.

UNIT VII LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS: Orbit consideration, coverage and frequency considerations, delay and throughput considerations, system considerations, operational NGSO constellation designs.

UNIT VIII SATELLITE NAVIGATION & THE GLOBAL POSITIONING SYSTEM: Radio and satellite navigation, GPS position location principles, GPS receivers and codes, satellite signal acquisition, GPS navigation message, GPS signal levels, GPS receiver operation, GPS C/A code accuracy, differential GPS.

TEXT BOOKS:

1. Timothi Pratt, Charles Bostian and Jeremy Allnutt, WSE, *Satellite communications*, Wiley publications, 2nd Edition, 2003.
2. Wilbur L.Prichard, Robert A. Nelson & Henry G.Suyderhoud, *Satellite communications Engineering*, Pearson Publications, 2nd Edition, 2003.

REFERENCE BOOKS:

1. M. Richharia, *Satellite communications: Design principles*, BS publications, 2nd Edition, 2003.
2. D.C.Agarwal, *Satellite communications*, Khanna publications, 5th Ed.
3. K.N.Rajarao, *Fundamentals of Satellite communications,* PHI, 2004.
4. Dennis Roddy, *Satellite communications*, McGraw Hill, 2nd Edition, 1996.

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IV Year B.Tech. ECE-II Semester

(1G387) BIO-MEDICAL INSTRUMENTATION
(ELECTIVE – III)

UNIT I INTRODUCTION: Physiological system of the body, Bio signals, Need for Bio-Instrumentation, Medical instrumentation system and its components- Bio-Amplifier, Characteristics of medical instruments, Problems encountered in measuring a living system.

UNIT II BIO–ELECTRIC POTENTIALS & TRANSDUCERS: Organization of Cell, Sources of Bio-electric potentials – Resting & Action potentials, Derivation for Nernst equation for resting potential, Propagation of action potentials, Various Bio-electric potentials and their waveforms – ECG, EEG, EMG.

UNIT III BIO-ELECTRODES: Bio-potential electrodes – Micro electrodes, Skin surface electrodes, Needle electrodes, Reference electrodes, pH electrodes, Blood gas electrodes and Specific ion electrodes.

UNIT IV HEART & CIRCULATION: Electrical conduction system & mechanical function of heart, Cardiac cycle, Cardiac excitation and control, Relation between electrical & mechanical activities of the heart.

UNIT V CARDIAC INSTRUMENTATION: Blood pressure & blood flow measurement, ECG machine, Einthoven triangle, 12-lead configuration, Analysis & interpretation of ECG waveform, Pace maker, Defibrillator and Hemodialysis machine.

UNIT VI NEURO MUSCULAR INSTRUMENTATION: Specifications of EEG & EMG machines, Electrode placement for EEG & EMG recording and Interpretation of EEG & EMG signals.

UNIT VII RESPIRATORY INSTUMENTATION: The physiology of the respiratory system, Instrumentation for measuring the mechanics of breathing – Spirometry, Pnemuotachograph, Ventilators. Gas exchange and distribution.

UNIT VIII PATIENT SAFETY & MEDICAL IMAGING SYSTEM: Electric shock hazards, leakage currents, Precautions to minimize electric shock hazards, the elements of Intensive-Care-Monitoring and other instruments for monitoring patients.

Medical imaging systems – Ultrasonic imaging system, X-Ray instruments (CT), Magnetic Resonance Imaging and Nuclear Medical Imaging.

TEXT BOOKS:

1. Leslie Cromwell and F.J Weibell, E.A Pfeiffer, *Biomedical instrumentation and Measurements,* PHI, 2nd Ed, 1980
2. R S Khandpur, *Hand book of Biomedical instrumentation*, TMH, 2nd Ed., 2003
3. R.Anandanatarajan, *Biomedical Instrumentation and Measurements*, PHI.

REFERENCE BOOKS:

1. John G.Webster, John Wiley, *Medical instrumentation*, Application and Design, 3rd Ed., 1998
2. L.A. Goddes and L.E. Basker, *Principles of Applied Biomedical Instrumentation*, John Wiley, 1975.

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IV Year B.Tech. ECE-II Semester

(1G48C) DATABASE MANAGEMENT SYSTEMS
(ELECTIVE – III)

UNIT I: Database System applications, database system Vs file system-view of data- data abstractions- instances and schemas- data models-relational model-other models-database languages- DDL -DML- database access for application programs-database users and administrator- history of database systems. Database Design and ER-diagrams-beyond ER-design entities, attributes and entity sets- relationships and relationship sets- additional features of ER-model-Concept design with the ER-model-Conceptual design for large enterprises.

UNIT II RELATIONAL MODEL: Introduction to the relational model-integrity constraint over relations-enforcing integrity constraints- querying relational data- logical database design.

Relational Algebra And Calculus- Relational algebra-selection and projection set operations-renaming- joins- divisions-examples of algebra overviews-relational calculus-tuple relational calculus-domain relational calculus.

UNIT III STRUCTURED QUERY LANGUAGE (SQL): Introduction to SQL-data definition commands-data manipulation commands-select queries- advanced data definition commands- advanced select queries-virtual tables: creating a view- updatable view-destroying view-joining database tables.

Advanced SQL- relational set operators- SQL join operators-sub queries and correlated queries-SQL functions-ORACLE sequences-Procedural SQL- triggers-cursors.

UNIT IV NORMALIZATION OF DATABASE TABLES: database tables and normalization-the need for normalization, the normalization process- improving the design - surrogate key considerations-higher level normal forms-normalization and database design-De-normalization.

UNIT V OVERVIEW OF TRANSACTION MANAGEMENT: ACID properties-transactions and schedules-concurrent execution of transaction-law of based concurrency control-performance locking-transaction support in SQL- introduction to recovery.

UNIT VI CONCURRENCY CONTROL: Serializability and recoverability- introduction to lock management-dealing with deadlocks-specialized locking techniques- concurrency without locking.

Crash Recovery-Introduction to ARIES- the log-recovery with concurrent transactions-buffer management-failure with loss of non-volatile storage-advanced recovery techniques-remote backup systems.

UNIT VII OVERVIEW OF STORAGE AND INDEXING: data on external storage-file organization and indexing- cluster indexes, primary and secondary indexes- index data structurers-hash based indexing-tree based indexing.

UNIT VIII STORING DATA: Disks and files-The memory hierarchy- redundant array of independent disks (RAID)- disk space management-Buffer manager-files of records-page formats-record formats.

Tree Structured Indexing: Intuitions for tree indexes-Indexed sequential access methods (ISAM)- B+trees.

Hash Based Indexing: Static hashing-extendable hashing-linear hashing-extendable Vs linear hashing.

TEXT BOOKS:

1. Raghurama Krishnan,Johannes Gehrke, *Data base Management Systems*, TataMcGrawHill
2. Peter Rob,Ananda Rao and Carlos Coronel, *Database Management Systems*, Cengage Learning.

REFERENCE BOOKS:

1. Silberschatz, Korth, *Database system Concepts*, McGraw hill, V edition
2. Elmasri, Navate, *Fundamentals of Database Systems*, Pearson Education.
3. *Oracle for professionals*, The X Team, S.Shah and V.Shah, SPD.
4. Database Systems Using Oracle: A Simplified guide to SQL and PL/SQL, shah, PHI.
5. M.L.Gillenson, *Fundamentals of Database Management Systems*, Wiley student Edition.
6. C.J.Date, *Introduction to Database Systems*, Pearson Education.