



**MALLA REDDY ENGINEERING COLLEGE  
(AUTONOMOUS)**

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

**Academic Regulations for B. Tech (Regular)  
(MR11 Regulations)**

*(Effective for the students admitted into I year from the Academic Year 2011-2012 onwards)*

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

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

- i. Pursued a course of study for not less than four academic years and not more than eight academic years.
  - ii. Register for 200 credits and secure 200 credits
- 2.** Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in B.Tech course.

**3. Courses of study**

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

1. Civil Engineering (CE)
2. Computer Science & Engineering (CSE)
3. Electrical & Electronics Engineering (EEE)
4. Electronics & Communications Engineering (ECE)
5. Information Technology (IT)
6. Mechanical Engineering (ME)

**4. Credits**

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

**5. Distribution and Weightage of Marks**

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

- vi. There shall be a seminar presentation in IV year II Semester. For the seminar, the student shall collect the information on a specialized topic and prepare a technical report, showing his understanding over the topic, and submit to the department, which shall be evaluated by the Departmental committee consisting of Head of the department, seminar supervisor and a senior faculty member. The seminar report shall be evaluated for 50 marks. There shall be no external examination for seminar.
- vii. There shall be a Comprehensive Viva-Voce in IV year II semester. The Comprehensive Viva-Voce will be conducted by a Committee consisting of (i) Head of the Department (ii) two Senior Faculty members of the Department. The Comprehensive Viva-Voce is aimed to assess the students' understanding in various subjects he / she studied during the B.Tech course of study. The Comprehensive Viva-Voce is evaluated for 100 marks by the Committee. There are no internal marks for the Comprehensive viva-voce.
- viii. Out of a total of 200 marks for the project work, 50 marks shall be for Internal Evaluation and 150 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by the same committee appointed for industry oriented mini project. In addition the project supervisor shall also be included in the committee. The topics for industry oriented mini project, seminar and project work shall be different from each other. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.
- ix. Laboratory marks and the sessional marks awarded by the concerned teacher are not final. They are subject to scrutiny and scaling by the Principal/Controller of examinations wherever necessary. In such cases, the sessional and laboratory marks awarded by the concerned teacher will be referred to a Committee **consisting of HOD, Senior professor in that particular department headed by Principal**. The Committee will arrive at a scaling factor and the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective departments/exam branch **for a minimum period of 6 years from the commencement of the batch**, as per the University norms and shall be produced to the Committees of the University as and when the same is asked for.

#### 6. Attendance Requirements:

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

#### 7. Minimum Academic Requirements:

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

- i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.
- ii. A student shall be promoted from II to III year only if he fulfills the academic requirement of 37credits from one regular and one supplementary examinations of I year, and one regular examination of II year I semester irrespective of whether the candidate takes the examination or not. Or as stipulated by affiliating University from time to time.
- iii. A student shall be promoted from third year to fourth year only if he fulfills the academic requirements of total 62 credits from the following examinations, whether the candidate takes the examinations or not. Or as stipulated by affiliating University from time to time.
  - a. Two regular and two supplementary examinations of I year.
  - b. Two regular and one supplementary examinations of II year I semester.

- c. One regular and one supplementary examinations of II year II semester.
  - d. One regular examination of III year I semester.
- iv. A student shall register and put up minimum attendance in all 200 credits and earn the 200 credits. Marks obtained in all 200 credits shall be considered for the calculation of percentage of marks.
- v. Students who fail to earn 200 credits as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in B.Tech course and their admission shall stand cancelled.
- 8. Course pattern:**
- i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.
  - ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.
  - iii. When a student is detained due to lack of credits / shortage of attendance he may be re-admitted when the semester / year is offered after fulfilment of academic regulations, whereas the academic regulations hold good with the regulations he was first admitted.
- 9. Award of Class:**
- After a student has satisfied the requirements prescribed for the completion of the program and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

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

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

- 10. Minimum Instruction Days:**
- The minimum instruction days for each semester / I year shall be 90/180 clear instruction days.
- 11.** There shall be no branch transfers after the completion of admission process.
- 12.** Transfer from other colleges will be permitted, as per rules stipulated by the affiliating University and State government.
- 13.** Detained candidates, either due to lack of credits or attendance, will be admitted to the class work, after successful completion of academic requirements and after obtaining permission from affiliating University.
- 14. General:**
- i. Where the words “he”, “him”, “his”, occur in the regulations, they include “she”, “her”, “hers”.
  - ii. The academic regulation should be read as a whole for the purpose of any interpretation.
  - iii. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.
  - iv. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the date notified by the University.

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## Academic Regulations for B. Tech.

(Lateral Entry Scheme)

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

1. The Students have to acquire 150 credits from II to IV year of B.Tech. Program (Regular) for the award of the degree.  
Register for **150** credits and secure **150** credits.
2. Students, who fail to fulfil the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.
3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

**4. Promotion Rule:**

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

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

**5. Award of Class:**

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

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

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

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

## MALPRACTICES RULES

### DISCIPLINARY ACTION FOR / IMPROPER CONDUCT IN EXAMINATIONS

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

3.	Impersonates any other candidate in connection with the examination.	The candidate who has impersonated shall be expelled from examination hall. The candidate is also debarred and forfeits the seat. The performance of the original candidate, who has been impersonated, shall be cancelled in all the subjects of the examination (including practical's and project work) already appeared and shall not be allowed to appear for examinations of the remaining subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat. If the imposter is an outsider, he will be handed over to the police and a case is registered against him.
4.	Smuggles in the Answer book or additional sheet or takes out or arranges to send out the question paper during the examination or answer book or additional sheet, during or after the examination.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with

		forfeiture of seat.
5.	Uses objectionable, abusive or offensive language in the answer paper or in letters to the examiners or writes to the examiner requesting him to award pass marks.	Cancellation of the performance in that subject.
6.	Refuses to obey the orders of the Principal/Controller of examinations any officer on duty or misbehaves or creates disturbance of any kind in and around the examination hall or organizes a walk out or instigates others to walk out, or threatens the officer-in charge or any person on duty in or outside the examination hall of any injury to his person or to any of his relations whether by words, either spoken or written or by signs or by visible representation, assaults the officer-in-charge, or any person on duty in or outside the examination hall or any of his relations, or indulges in any other act of misconduct or mischief which result in damage to or destruction of property in the examination hall or any part of the College campus or engages in any other act which in the opinion of the officer on duty amounts to use of unfair means or misconduct or has the tendency to disrupt the orderly conduct of the examination.	In case of students of the college, they shall be expelled from examination halls and cancellation of their performance in that subject and all other subjects the candidate(s) has (have) already appeared and shall not be permitted to appear for the remaining examinations of the subjects of that semester/year. The candidates also are debarred and forfeit their seats. In case of outsiders, they will be handed over to the police and a police case is registered against them.
7.	Leaves the exam hall taking away answer script or intentionally tears of the script or any part thereof inside or outside the examination hall.	Expulsion from the examination hall and cancellation of performance in that subject and all the other subjects the candidate has already appeared including

		practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred for two consecutive semesters from class work and all End examinations. The continuation of the course by the candidate is subject to the academic regulations in connection with forfeiture of seat.
8.	Possess any lethal weapon or firearm in the examination hall.	Expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.
9.	If student of the college, who is not a candidate for the particular examination or any person not connected with the college indulges in any malpractice or improper conduct mentioned in clause 6 to 8.	Student of the colleges expulsion from the examination hall and cancellation of the performance in that subject and all other subjects the candidate has already appeared including practical examinations and project work and shall not be permitted for the remaining examinations of the subjects of that semester/year. The candidate is also debarred and forfeits the seat.  Person(s) who do not belong to the College will be handed over to police and, a police case will be registered against

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

**Malpractices identified by squad or special invigilators**

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

**MALLA REDDY ENGINEERING COLLEGE  
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**B. TECH. Electronics and Communication Engineering  
I YEAR COURSE STRUCTURE**

Code	Subject	L	T/P/D	C
EN1Y1101	English	2	1	4
MA1Y1102	Mathematics-I	3	1	6
MA1Y1103	Mathematical Methods	3	1	6
PH1Y1104	Engineering Physics	2	1	4
CH1Y1105	Engineering Chemistry	2	1	4
CS1Y1106	Computer Programming & Data Structures	3	--	6
ME1Y1107	Engineering Drawing	2	3	4
CS1Y1108	Computer Programming Lab	--	3	4
PCH1Y110	Engineering Physics & Engineering Chemistry Lab	--	3	4
EN1Y1110	English Language Communication Skills Lab	--	3	4
MCS1Y111	Engineering Workshop/IT Workshop	--	3	4
	<b>Total</b>	<b>17</b>	<b>20</b>	<b>50</b>

**II year**

**COURSE STRUCTURE**

Code	Subject	T	P	C
MR11U401	Electronic Devices and Circuits	4	1	4
MR11U402	Probability theory and stochastic process	4	1	4
MR11U403	Signals and systems	4	1	4
<b>MR11U240</b>	Electric Circuits	3	1	3
<b>MR11U0M1</b>	Mathematics -II	3	1	3
<b>MR11U154</b>	Environmental Studies	3	1	3
MR11U404	Electronic Devices & Circuits Lab	-	3	2
MR11U405	Basic simulation Lab	-	3	2
		24	12	25

**I semester**

**II year**

**COURSE STRUCTURE**

**II semester**

Code	Subject	L	T/P/D	C
MR11U241	Principles of Electrical Engineering	3	1	3
MR11U406	Switching Theory and Logic Design	4	1	4
MR11U407	Pulse& Digital Circuits	4	1	4
MR11U408	Electromagnetic theory and Transmission Lines	4	1	4
MR11U409	Electronic Circuit Analysis	4	1	4
MR11U410	Electronic Circuit Analysis Lab	-	3	2
MR11U411	Pulse and Digital Circuits Lab	-	3	2
MR11U242	Electrical Engineering Lab	-	3	2
		19	14	25

**III year**

**COURSE STRUCTURE**

**I semester**

Code	Subject	L	T/P/D	C
MR11U412	Integrated Circuits and Applications	4	1	4
<b>MR11U243</b>	Control Systems	3	1	3
MR11U413	Antennas and Wave Propagation	4	1	4
MR11U414	Analog Communication	4	1	4
<b>MR11U504</b>	Computer Organization	3	1	3
<b>MR11UB01</b>	Managerial Economics financial Analysis	3	1	3
MR11U415	IC LAB	-	3	2
MR11U416	AC LAB	-	3	2
		24	12	25

## III year

COURSE STRUCTURE

## II semester

Code	Subject	L	T/P/D	C
MR11U417	Digital Communications	4	1	4
MR11U418	Digital Signal Processing	4	1	4
<b>MR11UB02</b>	Management Science	4	1	4
MR11U419	Microprocessors and Microcontrollers	4	1	4
MR11U545 MR11U506 MR11U514	Open Elective- Advanced Data Structures OOPS Operating Systems	3	1	3
MR11U420	Digital Signal Processing Lab	-	3	2
MR11U421	Micro processors and Microcontrollers Lab	-	3	2
<b>MR11U0E1</b>	Advanced English Communicative skills Lab	-	3	2
		<b>19</b>	<b>14</b>	<b>25</b>

## IV year

COURSE STRUCTURE

## I semester

Code	Subject	L	T/P/D	C
MR11U422	Microwave Engineering	3	1	3
MR11U423	VLSI Design	4	1	4
MR11U424	Electronic Measuring Instruments	4	1	4
<b>MR11U603</b>	Computer Networks	4	1	4
MR11U425 MR11U426 MR11U427 MR11U428	ELECTIVES-I DSP Processors and Architectures Digital Image Processing Television Engineering Global position Systems	3	1	3
MR11U429 MR11U430 MR11U431 <b>MR11U460</b>	ELECTIVES-II Optical Communications ERTOS EMI/EMC Fundamental Concepts And Applications Of MEMS	3	1	3
MR11U432	ECAD & VLSI Design Lab	-	3	2
MR11U433	Microwave Engineering & DC lab	-	3	2
		21	12	25

## IV year

COURSE STRUCTURE

## II semester

Code	Subject	L	T/P/D	C
MR11U434 MR11U435 MR11U436 <b>MR11U546</b>	ELECTIVES-III Wireless Communications & Networks Satellite Communications Biomedical Instrumentation Artificial Neural Networks	3	1	3
MR11U437 MR11U438 MR11U439 <b>MR11U547</b>	ELECTIVES-IV Telecommunication Switching Systems Radar Systems Spread Spectrum Communications <b>Network Security &amp; Cryptography</b>	3	1	3
MR11U440 MR11U441 MR11U442 MR11U443	ELECTIVES-V RF Circuit Design CPLD & FPGA Pattern Recognition CAD for VLSI	3	1	3
MR11U444 MR11U445	Major Project General Seminars	- -	15 6	10 2
MR11U446	Industry Oriented mini Project	-	-	2
MR11U447	Comprehensive Viva	-	-	2
		<b>9</b>	<b>24</b>	<b>25</b>

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

T – Theory          P – Practical          C – Credits

2011-2012

MALLAREDDY ENGINEERING COLLEGE  
(AUTONOMOUS)

Code: MR11U401

II YEAR B.TECHLECE – I SEM

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

### ELECTRONIC DEVICES AND CIRCUITS

#### UNIT I:

**P-N Junction Diode:** Qualitative Theory of p-n Junction, p-n junction as a diode, Diode Equation, Volt-Ampere Characteristics, Temperature dependence of VI characteristic, Ideal versus Practical – Resistance levels (Static and Dynamic), Transition and Diffusion capacitances, Diode Equivalent Circuits, Load Line Analysis, Breakdown Mechanisms in Semiconductor Diodes, Zener Diode Characteristics.

#### UNIT II:

**Rectifiers and Filters:** The p-n junction as a rectifier, Half wave rectifier, Full wave rectifier, Bridge Rectifier, Harmonic components in a Rectifier circuit, Inductor Filters, Capacitor Filters, L-Section Filters,  $\Pi$ -Section Filters, Comparison of Filters, Voltage regulation using Zener diode.

#### UNIT III:

**Bipolar Junction Transistor:** The junction transistor, Transistor current components, Transistor as an Amplifier, Transistor Construction, BJT Operation, BJT symbol, Common Base, Common Emitter and Common Collector Configurations, Limitations of Operation, BJT Specifications.

#### UNIT IV:

**Transistor Biasing and Stabilization:** Operating Point, The DC and AC load lines, Need for Biasing, Fixed Bias, Collector feedback Bias, Emitter feedback Bias, Collector-Emitter feedback bias, Voltage Divider Bias, Bias Stability, Stabilization factors, Stabilization against variations in  $V_{be}$  and  $\beta$ , Bias Compensation using Diodes and Transistors, Thermal runaway, Thermal Stability.

#### UNIT V:

**Small Signal Low Frequency BJT Models:** BJT hybrid model, Determination of h- parameters from transistor characteristics, Analysis of a transistor Amplifier Circuit using h- Parameters, Comparison of CB, CE and CC Amplifier Configurations.

#### UNIT VI:

**Field Effect Transistor:** The Junction Field Effect Transistor (Construction, principle of operation, symbol) – Pinch-off Voltage – Volt-Ampere Characteristics, The JFET Small Signal model, MOSFET (Construction, principle of operation, symbol), MOSFET Characteristics in Enhancement and Depletion Modes.

#### UNIT VII:

**FET Amplifiers:** FET Common Source Amplifier, Common Drain Amplifier, Generalized FET Amplifier, Biasing FET, FET as Voltage Variable Resistor, Comparison of BJT and FET, The Uni Junction Transistor.

#### UNIT VIII:

**Special purpose Electronic Devices:** Principle of Operation and Characteristics of Tunnel Diode ( with the help of Energy band Diagram) and Varactor Diode, Principle of operation of Schottky barrier Diode, SCR, and Semiconductor Photo Diode.

#### TEXT BOOKS:

1. Millman's Electronic Devices and Circuits – J.Millman, C.C. Halkias and Satyabrata Jit, 2ed., 1998, TMH.
2. Electronic Devices and Circuits – R.L.Boylestad and Louis Nashelsky, 9ed., 2006, PEI/PHI.
3. Introduction to Electronic Devices and Circuits – Rober T. Paynter.PE.

#### REFERENCES:

1. Integrated Electronics - J.Millman, C.C. Halkias, 1991 ed., 2008, TMH.
2. Electronic Devices and Circuits – K. Lal Kishore, 2ed., 2005, BSP.
3. Electronic Devices and Circuits – Anil K. Maini, Varsha Agarwal, 1ed., 2009, Wiley India Pvt. Ltd.
4. Electronic Devices and Circuits – S. Salivahanan, N. Suresh Kumar, a. Vallavaraj, 2ed., 2008, TMH.

**PROBABILITY THEORY AND STOCHASTIC PROCESS****UNIT I:**

**Probability:** Probability introduced through Sets and Relative Frequency: Experiments and Sample Spaces, Discrete and Continuous Sample Spaces, Events, Probability Definitions and Axioms, Mathematical Model of Experiments, Probability as a Relative Frequency, Joint Probability, Conditional Probability, Total Probability, Bayers Theorem, and Independent Events

**UNIT II:**

**The Random Variable:** Definition of a Random Variable, Conditions for a Function to be a Random Variable, Discrete and Continuous, Mixed Random Variable, Distribution and Density functions, Properties, Binomial, Poisson, Uniform, Gaussian, Exponential, Rayleigh, Conditional Distribution, Methods of defining Conditioning Event, Conditional Density, Properties

**UNIT –III:**

**Operation On One Random Variable-Expectation:** Introduction, Expected value of a random variable, function of a random variable, moments about the origin, central moments, variance and skew, chebychev's inequality, characteristic function, moment generating function, transformations of a random variable, monotonic transformations for a continuous random variable, nonmonotonic transformations of continuous random variable, transformations of continuous random variable

**UNIT IV:**

**Multiple Random Variables:** Vector Random Variables, Joint Distribution Function, Properties of Joint Distribution, Marginal Distribution Functions, Conditional Distribution and Density, Point Conditioning, Conditional Distribution and Density- Interval conditioning, Statistical Independence, Sum of Two Random Variables, Sum of Several Random Variables, Central Limit Theorem, (Proof not expected). Unequal Distribution, Equal Distributions.

**UNIT V:**

**Operations on Multiple Random Variables:** Expected Value of a Function of Random Variables: Joint Moments about the Origin, Joint Central Moments, Joint Characteristic Functions, and Jointly Gaussian Random Variables: Two Random Variables case, N Random Variable case, Properties, Transformations of Multiple Random Variables, and Linear Transformations of Gaussian Random Variables.

**UNIT VI:**

**Stochastic Processes - Temporal Characteristics:** The Stochastic process Concept, Classification of Processes, Deterministic and Nondeterministic Processes, Distribution and Density Functions, concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second- Order and Wide-Sense Stationarity, N<sup>th</sup>-Order and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic Processes, Correlation-Ergodic Processes,

Autocorrelation Function and Its Properties, Cross-Correlation Function and Its Properties, Covariance Functions and its properties, Gaussian Random Processes, Poisson Random Process.

**UNIT VII:**

**Stochastic 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. Spectral characteristics of system response, power density spectrum of response, cross power spectral density of input and output of a linear system

**UNIT VIII:**

**Noise :** Types of Noise: Resistive(Thermal) Noise Source, Shot noise, extra terrestrial noise, Arbitrary Noise Sources, white noise, narrowband noise: in phase and quadrature phase components and its properties, modeling of noise sources, average noise bandwidth, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks.

**TEXT BOOKS:**

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

**REFERENCE BOOKS:**

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

**MALLAREDDY ENGINEERING COLLEGE  
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**II YEAR B.TECH.ECE – I SEM**

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

**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, Dirchlet 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, and 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, Parsevals 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, relation between L.T 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. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.

**REFERENCE BOOKS:**

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

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**II YEAR B.TECH.ECE – I SEM**

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

**ELECTRIC CIRCUITS**

**UNIT –I:**

Circuit Concept, R-L-C Parameters, Voltage and Current Sources, Independent and Dependent Sources, Source Transformation, Voltage – Current relationship for Passive Elements (for different input signals – Square, Ramp, Saw tooth and Triangular.)

**UNIT–II:**

Kirchhoff's Laws, Network Reduction Techniques, Series, Parallel, Series Parallel, Star-To-Delta Or Delta-To-Star Transformation. Nodal Analysis, Mesh Analysis, Super Node And Super Mesh For D-C Excitations.

**UNIT –III: Single Phase A.C. Circuits**

R.M.S And Average Values And Form Factor For Different Periodic Wave Forms, Steady State Analysis Of R, L And C (In Series, Parallel And Series Parallel Combinations) With Sinusoidal Excitation , Concept Of Reactance, Impedance, Susceptance And Admittance , Phase And Phase Difference , Concept Of Power Factor, Real And Reactive Powers , J-Notation, Complex And Polar Forms Of Representation, Complex Power

**UNIT –IV: Locus Diagrams & Resonance**

Locus Diagrams, Series R-L, R-C, R-L-C and Parallel combination with variation of various parameters, Resonance – Series, Parallel Circuits, Concept of Band width and Q factor.

**UNIT –V: Magnetic Circuits**

Magnetic Circuits , Faraday's Laws Of Electromagnetic Induction , Concept Of Self And Mutual Inductance , Dot Convention , Coefficient Of Coupling , Composite Magnetic Circuit - Analysis Of Series And Parallel Magnetic Circuits

**UNIT –VI: Network Topology**

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

**UNIT –VII:**

**Network Theorems (With D.C):** Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, and Millman's And Compensation Theorems for D.C. Excitations.

**UNIT –VIII:**

**Network Theorems (With A.C):** Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's Maximum Power Transfer, and Millman's And Compensation Theorems for A.C. Excitations.

**TEXT BOOKS:**

1. Engineering Circuit Analysis – W.H. Hayt and J.E. Kemmerly and S.M. Durbin, 6 ed., 2008, TMH.
2. Circuits & Networks by A.Sudhakar and Shyammohan S.Pillai, 3 ed., 2009, TMH
3. Electric Circuits by A. Chakrabarthy, Dhanipar Rai & Sons.

**REFERENCES:**

1. Network Analysis – M.E. Vanvalkenburg, 3 ed., PHI.
2. Linear Circuit Analysis – Raymond A. DeCarlo and Pen-Min-Lin, 2 ed., 2004, Oxford University Press.
3. Network Analysis and Synthesis - N.C.Jagan and C.Lakshminarayana, B.S.Publications, 2006.
4. Electric Circuit Theory – K.Rajeswaran, 2004, PE
5. Basic Circuit Analysis – D. R. Cunnigham & J. A. Stuller, Jaico Publications.

## MATHEMATICS - II

**UNIT I:**

Special Functions I: Review of Taylors series for a real many valued functions, Series Solutions of Differential equations, Gamma and Beta Functions-their Properties-Evaluation of Improper Integrals. Bessel Functions – Properties- Recurrence Relations- Orthogonality.

**UNIT II:**

Special Functions II: Legendre Polynomials –Properties- RodrigueZ’s Formula- Recurrence Relations-Orthogonality.Chebycher’s Polynomials –Properties-recurrence relations – Orthogonality.

**UNIT III:**

Functions Of A Complex Variable: Continuity- Differentiability- Analyticity- Properties-Cauchy-Riemann conditions, Maxima-Minima principle, Harmonic and Conjugate Harmonic Functions- Milne -Thompson Method. Elementary Functions, General Power  $Z^6$  Principal value Logarithmic Function.

**UNIT IV:**

Complex Integration: Line Integral - Evaluation along a Path and by Indefinite Integration-Cauchy’s Integral Theorem-Cauchy’s Integral Formula- Generalized Integral Formula.

**UNIT V:**

Complex Power Series: Radius of Convergence - Expansion in Taylor’s Series, Maclaurins Series and Laurent Series. Singular Point -Isolated Singular Point-Pole Of Order m- Essential Singularity (Distinction between the Real analyticity and complex analyticity)

**UNIT VI:**

Contour Integration: Residue- Evaluation of residue by formula and by Laurent series - Residue theorem. Evaluation of integrals of the type

(a) Improper real integrals  $\int_{-\infty}^{\infty} f(x)dx$

(b)  $\int_c^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

(c)  $\int_{-\infty}^{\infty} e^{isDLx} f(x)dx$

(d) Integrals by indentation.

**UNIT VII:**

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

**UNIT VIII:**

**Elementary graph Theory:** Graphs, Representation by matrices, Adjacent matrix-Incident Matrix-Simple, Multiple, Regular, Complete, Bipartite & Planar Graphs-Hamiltonian and Eulerian Circuits-Trees Spanning tree- minimum Spanning tree.

**TEXT BOOKS:**

1. Engineering Mathematics –III by P.B. Bhaskara Rao, S.K.V.S Rama Chary, M.Bhujanga Rao & others.
2. Engineering Mathematics –III by C.Shankaraiah ,V.G.S.Book Links

**REFERENCES:**

1. A text Book of Engineering Mathematics, Vol-III T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. Higher Engineering Mathematics by B.S.Grewal Khanna Publications.
3. Advanced Engineering Mathematics by Jain & S.R.K. Iyengar ,Narasa Publications.
4. Complex Variables by R.V.Churchill.
5. Advanced Engineering Mathematics by Allen Jaffrey Academic press.

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**II YEAR B.TECH.ECE – I SEM**

**L T/P/D C  
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**ENVIRONMENTAL SCIENCE**

**UNIT I:**

Ecosystems: Definition, Scope and Importance of ecosystem, Concept of ecosystem, Classification of ecosystems Structure and Structural Components of an ecosystem, Functions of ecosystem, Food chains, food webs and ecological pyramids. Flow of energy, Biogeochemical cycles, Homeostasis / Cybernetics, Food chain concentration, Biomagnifications, ecosystems value, services and carrying capacity.

**UNIT II:**

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

**UNIT III:**

Biodiversity and Biotic Resources: Introduction, Definition, Genetic, Species and Ecosystem Diversity. Value of Biodiversity: Consumptive Use, Productive Use, Social, Ethical Aesthetic and Intrinsic Values. Hot Spots of Biodiversity. Threats Biodiversity: Habitat Loss, Poaching Of Wildlife, Man-Wildlife Conflicts Conservation of Biodiversity. In-Situ 1 Ex-Situ Conservation. Fex and Fodder Resources, Timber and Non-Timber Forest Products.

**UNIT IV:**

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

**UNIT V:**

Global Environmental Problems And Global Efforts: Green house effect, Green House Gases (GHG), Global Warming, Sea level rise, Climate change and their impacts on human environment. Ozone depletion and Ozone depleting substances (ODS). Deforestation and desertification. International conventions / Protocols: Earth summit, Kyoto protocol and

Montreal Protocol.

**UNIT VI:**

Environmental Impact Assessment (Eia) and Environmental Management Plan: Definition Of Impact, classification of impacts, Positive and Negative, Reversible and irreversible, light, moderate and severe, methods of baseline data acquisition. Impacts on different components: such as human health resources, air, water, flora, fauna and society. Prediction of impacts and impact assessment methodologies. Environmental Impact Statement (EIS). Environmental Management Plan (EMP): Technological Solutions, preventive methods, Control technologies, treatment technologies: green-belt-development, rain water harvesting, remote sensing and GIS methods.

**UNIT VII:**

Environmental Policy, Legislation, Rules and Regulations: National Environmental Policy Environmental Protection act, Legal aspects Air (Prevention and Control of pollution ) Act-1981, Water( Prevention and Control of pollution ) Act-1974, Water pollution Cess Act-1977, Forest Conservation Act, Municipal solid waste management and handling rules, biomedical waste management and handling rules, hazardous waste management and handling rules .

**UNIT VIII:**

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

**TEXT BOOKS:**

1. Environmental studies, from crisis to cure by R.Rajagopalar 2005
2. Text book of Environmental Science and Technology by M.Ar. Reddy 2007
3. Environmental studies by Erach Bharucha 2005, University: Grants Commission, University Press.

**REFERENCE BOOKS:**

1. Environmental Science: towards a sustainable future by Richer; T.Wright. 2008 PHL Learning Private Ltd. New Delhi
2. Environmental Engineering and science by Gilbert McMaster-and Wendell P. Ela .2008 PHI Learning Pvt. Ltd.

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**II YEAR B.TECH.ECE – I SEM**

**L T/P/D C  
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**(ELECTRONIC DEVICES & CIRCUITSLAB)**

6. Ammeters -0-20 $\mu$ A, 0-50 $\mu$ A, 0-100 $\mu$ A  
7. (Analog or Digital) 0-200 $\mu$ A, 0-10mA.  
8. Voltmeters -0-50V, 0-100V, 0-250V.  
9. (Analog or Digital)Electronic Components

(  
-Resistors, Capacitors, BJTs,  
LCDs, SCRs, UJTs, FETs, LEDs, MOSFET's,  
Diodes Ge & Si type, Transistors – npn, pnp  
type.

**PART A:**

**(Only for Viva-voce Examination)**

**ELECTRONIC WORKSHOP PRACTICE ( in 3 Lab sessions):**

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

**PART B:**

**(For Laboratory Examination – Minimum of 10 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 in CB Configuration.
4. Input and Output Characteristics of Transistor in CE Configuration.
5. Half Wave Rectifiers with & without Filters.
6. Full Wave Rectifiers with & without Filters.
7. FET Characteristics.
8. Measurement of h parameters of transistor in CB, CE, CC Configurations.
9. Frequency Response of CC Amplifier.
10. Frequency Response of CE Amplifier.
11. Frequency Response of Common Source FET Amplifier.
12. SCR Characteristics.
13. UJT Characteristics.

**PART C:**

**Equipment required for Laboratories:**

1. Regulated Power Supplies-0-30V
- (i) (RPS)
2. CRO's-0-20MHz.
3. Function Generators -0-1 MHz. Multimeters
4. Decade Resistance Box/Rheostats
5. Decade Capacitance Boxes

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**BASIC SIMULATION LAB**

1. Basic Operations on Matrices.
2. Generation of Various Signals and Sequences (Periodic and Aperiodic), such as Unit impulses, Unit Step, Square, Saw tooth, Triangular, Sinusoidal, Ramp, Sinc.
3. Operation of Signals and Sequences such as Addition, Multiplication, Scaling, Shifting, Folding, Computation of Energy and Average Power.
4. Finding the Even and Odd parts of Signal Sequence and Real and Imaginary parts of Signal.
5. Convolution between Signals and Sequences.
6. Auto Correlation and Cross Correlation between signals and Sequences.
7. Verification of linearity and Time Invariance Properties of a given Continuous/ Discrete System.
8. Computation of unit Sample, Unit Step and sinusoidal responses of the given LTI System and Verifying its Physical reliability and stability Properties.
9. Gibbs Phenomenon.
10. Finding the Fourier Transform of a given Signal and Plotting its magnitude and Phase Spectrum.
11. Waveform Synthesis using Laplace Transform.
12. Locating the Zeros and Poles and Plotting the Pole-Zero maps in S plane and Z-plane for the given Transfer Function.
13. Generation of Gaussian Noise (Real and Complex), Computation of its mean, M.S.Value and its skew, kurtosis, and PSD, probability Distribution function.
14. Sampling Theorem Verification.
15. Removal of noise by Autocorrelation/ Cross Correlation.
16. Extraction of Periodic Signal masked by noise using Correlation.
17. Verification of Weiner-Khinchine Relations
18. Checking a Random Process for Stationary in wide sense.

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II YEAR B.TECH.ECE – II SEM

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**PRINCIPLES OF ELECTRICAL ENGINEERING**

**UNIT I:**

Transient Analysis (First and Second Order Circuits): Transient Response of RL , RC Series, RLC Circuits for DC excitations, Initial Conditions, Solution using Differential Equations approach and Laplace Transform Method.

**UNIT II:**

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

**UNIT III:**

Filters: Classification of Filters, Filter Networks, Classification of Pass band and Stop band, Characteristic Impedance in the Pass and Stop Bands, Constant k Low Pass Filter, High Pass Filter, m-derived T-Section, Band Pass filter and Band Elimination filter, Illustrative Problems.

**UNIT IV:**

Symmetrical Attenuators : Symmetrical Attenuators – T Type Attenuator,  $\delta$ - Type Attenuator, Bridged T type Attenuator, Lattice Attenuator.

**UNIT V:**

DC Generators : Principle of Operation of DC Machines, EMF equation, Types of Generators, Magnetization and Load Characteristics of DC Generators

**UNIT VI:**

DC Motors: DC Motors, Types of DC Motors, Characteristics of DC Motors, Losses and Efficiency, Swinburne's Test, Speed of Control of DC Shunt Motor, Flux and Armature Voltage control methods.

**UNIT VII:**

Transformers and Performance: Principle of Operation of single phase transformer – types – constructional features- phasor diagrams on No Load & Load – Equivalent circuit Losses and Efficiency of transformer and Regulation-OC & SC tests- Predetermination of Efficiency and regulation-problems

**UNIT VIII:**

Single Phase Induction Motors: Principle of Operation, Shaded Pole motors, Capacitor motors, AC Servomotor, AC Tachometers, Synchronos, Stepper Motors, Characteristics.

**TEXT BOOKS:**

Fundamentals of Electric Circuits Charles K. Alexander, Mathew N. O. Sadiku, 3 ed., 2008, TMH.

1. Network Analysis – A Sudhakar, Shyammohan S. Palli, 3 ed., 2009, TMH.
2. Introduction to Electrical Engineering M.S.Naidu and S. Kamakshaiah, 2008, TMH.

**REFERENCES:**

1. Networks, Lines and Fields – John.D. Ryder, 2 ed., 2008 (Reprint), PHI
2. Engineering Circuit Analysis – W.H. Hayt and J.E. Kemmerly and S.M. Durbin, 6 ed., 2008, TMH.
3. Network analysis and Synthesis – C L Wadhwa, 3 ed., 2007, New Age International Publishers.
4. Network Analysis – N.C. Jagan and C. Lakshmi Narayana, BSP, 2006.
5. Electric Circuits – Nilsson, Riedel, 8 ed., PE.

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II YEAR B.TECH.ECE – II SEM

L T/P/D C

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**SWITCHING THEORY AND LOGIC DEVICES**

**UNIT I:**

Number Systems & Codes: Philosophy Of Number Systems - Complement Representation Of Negative Numbers-Binary Arithmetic-Binary Codes-Error Detecting & Error Correcting Codes Hamming Codes.

**UNIT II:**

Boolean algebra And Switching Functions: Fundamental Postulates Of Boolean Algebra - Basic Theorems And Properties - Switching Functions Canonical And Standard Forms-Algebraic Simplification Digital Logic Gates, Properties Of XOR Gates, Universal Gates-Multilevel NAND/NOR Realizations.

**UNIT III:**

Minimization Of Switching Functions: The Karnaugh Map Method, Five and Six Variable maps, Prime and Essential Implicants, Don't Care Map Entries, Minimal SOP and POS Forms, Tabular Method, Prime -Implicant Chart, Simplification Rules.

**UNIT IV:**

Combinational Logic Design: Design Using Conventional Logic Gates, Arithmetic Circuits, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular Design Using IC Chips, MUX Realization Of Switching Functions Parity Bit Generator, Code-Converters, Comparators Hazards And Hazard Free Realizations.

**UNIT V:**

Programmable Logic Devices, Threshold Logic: Basic PLD's- ROM, PROM, PLA, PLD Realization of Switching Functions Using PLD's. Capabilities and Limitations of Threshold Gate, Synthesis of Threshold Functions, Multigate Synthesis.

**UNIT VI:**

Sequential Circuits: Classification of Sequential Circuits (Synchronous, Asynchronous, Pulse Mode, Level Mode with Examples) Basic Flip-Flops-Triggering and Excitation Tables. Steps In Synchronous Sequential Circuit Design. Design of Modulo-N Ring & Shift Counters, Serial Binary Adder, Sequence Detector.

**UNIT VII:**

Sequential Circuits - II: Finite State Machine-Capabilities and Limitations, Mealy and Moore Models-Minimization of Completely Specified and Incompletely Specified Sequential Machines, Partition Techniques and Merger Chart Methods-Concept of Minimal Cover Table.

**UNIT VIII:**

Algorithmic State Machines: Salient Features of the ASM Chart-Simple Examples-System Design Using Data Path and Control Subsystems-Control Implementations-Examples Of

**TEXT BOOKS:**

Switching & Finite Automata theory - Zvi Kohavi, TMH, 2nd Edition.

1. Digital Design - Morris Mano, PHI, 3rd Edition, 2006.
2. Switching Theory And Logic Devices – A. Anand Kumar, PHI, 2<sup>nd</sup> Edition.
- 3.

**REFERENCE BOOKS:**

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

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**PULSE & DIGITAL CIRCUITS**

**UNIT I:**

**Linear Wave Shaping:** High pass and low pass RC circuits and their response for Sinusoidal, Step, Pulse, Square, & Ramp inputs, High pass RC network as Differentiator, Low pass RC circuit as an Integrator, Attenuators and its application as a CRO Probe, 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, Applications of Voltage comparators. Clamping Operation, Clamping circuit taking Source and Diode resistances into account, Clamping Circuit Theorem, Practical Clamping Circuits, Effect of Diode Characteristics on Clamping Voltage, Synchronized Clamping.

**UNIT III:**

**Switching Characteristics of Devices:** Diode as a Switch, Piecewise Linear Diode Characteristics, Diode Switching times, Transistor as a Switch, Break down voltages, Transistor in Saturation, Temperature variation of Saturation Parameters, Transistor-switching times, Silicon-controlled-switch circuits.

**UNIT IV:**

**Multivibrators:** Analysis and Design of Bistable, Monostable and Astable Multivibrators and Schmitt trigger using Transistors.

**UNIT V:**

**Time Base Generators:** General features of a Time base Signal, Methods of Generating Time Base Waveform, Miller and Bootstrap Time base Generators-Basic Principles, Transistor Miller Time Base generator, Transistor Bootstrap Time Base Generator, Transistor Current Time Base Generators, Methods of Linearity improvement.

**UNIT VI:**

**Sampling Gates:** Basic operating principles of Sampling Gates, Unidirectional and Bi-directional Sampling Gates, Four Diode Sampling Gate, Reduction of pedestal in Gate Circuits, Six Diode Gate, Application of Sampling Gates.

**UNIT VII:**

**Synchronization and Frequency Division:** Pulse Synchronization of Relaxation Devices, Frequency division in Sweep Circuit, Stability of Relaxation Devices, Astable Relaxation Circuits, Monostable Relaxation Circuits, 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 Using Diodes & Transistors:** AND, OR and NOT Gates using Diodes and Transistors, DCTL, RTL, DTL, TTL and CML Logic Families and its Comparison.

### TEXT BOOKS:

1. Millman's Pulse, Digital and Switching Waveforms J. Millman, H. Taub and Mothiki S. Prakash Rao 2 ed., 2008, TMH.
2. Solid State Pulse circuits David A. Bell, 4 ed., 2002 PHI

### REFERENCE BOOKS:

1. Pulse and Digital Circuits A. Anand Kumar, 2005, PHI.
2. Fundamentals of Pulse and Digital Circuits- Ronald J. Tocci, 3 ed., 2008.
3. Pulse and Digital Circuits Motheki S. Prakash Rao, 2006, TMH.
4. Wave Generation and Shaping - L. Strauss.

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II YEAR B.TECH.ECE – II SEM

L T/P/D C

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**ELECTRO MAGNETIC THEORY AND TRANSMISSION LINES**

### UNIT I:

**Electrostatics- I:** Review of 3D Coordinate System Correlated with Vectors, Coulomb's Law, Electric Field Intensity- Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, and Illustrative Problems.

### UNIT II:

**Electrostatics- II :**Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance- Parallel Plate, Coaxial, Spherical Capacitors, Illustrative Problems.

### UNIT III:

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

### UNIT IV:

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

### UNIT V:

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

### UNIT VI:

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

### UNIT 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, Illustrative Problems.

### UNIT VIII:

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

### **TEXT BOOKS:**

1. Elements of Electromagnetics“Matthew N.O. Sadiku, 4 ed., 2008, Oxford Univ.Press.
2. Electromagnetic Waves and Radiating Systems“ E.C. Jordan and K.G. Balmain, 2 ed., 2000, PHI.
3. Transmission Lines and Networks“Umesh Sinha, Satya Prakashan, 2001, (Tech. India Publications), New Delhi.

### **REFERANCE BOOKS:**

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

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MALLAREDDY ENGINEERING COLLEGE  
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II YEAR B.TECH.ECE – II SEM

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ELECTRONIC CIRCUIT ANALYSIS

### UNIT I:

**Single Stage Amplifiers:** Classification of Amplifiers- Distortion in amplifiers, Analysis of CE, CC and CB Configurations with Simplified Hybrid model, Analysis of CE Amplifier with Emitter Resistance and Emitter Follower, Miller’s theorem and its dual, Design of single stage RC Coupled Amplifier using BJT.

### UNIT II:

**Multi Stage Amplifiers:** Analysis of cascaded RC Coupled BJT Amplifiers, Cascode Amplifier, Darlington pair, Different Coupling Schemes used in Amplifiers – RC Coupled Amplifier, Transformer Coupled Amplifier, Direct Coupled Amplifier.

### UNIT III:

**BJT Amplifiers – Frequency Response:** Logarithms, Decibels, General Frequency considerations, Frequency response of BJT Amplifier, Analysis at low and high frequencies, Effect of coupling and bypass capacitors, The Hybrid PI – Common emitter transistor model, CE short circuit current gain, Current gain with resistive load, Single stage CE transistor Amplifier response, Gain Bandwidth Product, Emitter Follower at higher frequencies.

### UNIT IV:

**MOS Amplifiers:** Basic concepts, MOS Small signal model, CS Amplifier with Resistive load, Diode connected load and current source load, Source Follower, Common Gate stage Cascode and Folded Cascode Amplifier and their frequency response.

### UNIT V:

**Feedback Amplifiers:** Concepts of Feedback, classification of Feedback Amplifiers, General characteristics of Negative feedback Amplifiers, Effect of feedback on Amplifier characteristics, Voltage Series, Voltage Shunt, Current Series and Current Shunt feedback Configurations, Illustrative problems.

### UNIT VI:

**Oscillators:** Classification of Oscillators, Conditions for Oscillations, RC Phase Shift Oscillator, Generalized analysis of LC Oscillators – Hartley and Colpitt’s Oscillators, Wien- Bridge and Crystal Oscillators, Stability of Oscillators.

### UNIT VII:

**Large Signal Amplifiers:** Classification, Class A Large Signal Amplifiers, Transformer Coupled Class A Audio Power Amplifier, Efficiency of Class A Amplifier, Class B Amplifier, Efficiency of Class B Amplifier, Class B Push-Pull Amplifier, Complementary symmetry Class B Push-Pull Amplifier, Distortion in Power Amplifiers, Thermal stability and Heat Sinks.

### UNIT VIII:

**Tuned Amplifiers:** Introduction, Q- Factor, Small Signal Tuned Amplifiers, Effect of Cascading Single Tuned Amplifiers on Bandwidth, Effect of Cascading Double Tuned Amplifiers on Bandwidth, Stagger Tuned Amplifiers, Stability of Tuned Amplifiers.

#### **TEXT BOOKS:**

1. Integrated Electronics – Jacob Millman and C.C. Halkias, 1991 ed., 2008, TMH.
2. Electronic Devices and Circuits – S. Salivahanan, N. Suresh Kumar, A. Vallavaraj, 2ed., 2009, TMH.
3. Design of Analog CMOS Integrated Circuits – Behzad Razavi, 2008, TMH.

#### **REFERENCES:**

1. Electronic Devices and Circuit Theory – Robert L. Boylestad, Louis Nashelsky, 9ed., 2008 PE.
2. Introductory Electronic Devices and Circuits – Robert T. Paynter, 7ed., 2009, PEI.
3. Electronic Circuit analysis – K. Lal Kishore, 2004, BSP.
4. Electronic Devices and Circuits, David A. Bell – 5ed., Oxford University Press.
5. Micro electric Circuits – Sedra and Smith – 5ed., 2009, Oxford University Press.

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II YEAR B.TECH.ECE – II SEM

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(MR11U410) ELECTRONIC CIRCUIT ANALYSIS LAB

List of Experiments (12 experiments to be done):

#### **I) Design and Simulation in Simulation Laboratory using any Simulation Software.**

**(Any 6 Experiments):**

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

#### **II) Testing in Hardware Laboratory (6 Experiments):**

**a) Any THREE Circuits simulated in Simulation Laboratory**

**b) Any THREE of the following**

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

**Experiments required for Laboratories:**

1. For Software Simulation of Electronic Circuits.
  - i) Computer Systems with latest Specifications.
  - ii) Connected in LAN (Optional).
  - iii) Operating System (Windows XP).
  - iv) Suitable Simulations Software.
2. For Hardware Simulation of Electronic Circuits.
  - i) Regulated Power Supply (0-30V).
  - ii) CRO's.
  - iii) Function Generators.
  - iv) Multimeters.
  - v) Components.

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PULSE DEVICES AND CIRCUITS LAB

**LIST OF EXPERIMENTS:**

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

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ELECTRICAL ENGINEERING LAB

**PART A**

1. Verification of KVL and KCL
2. Serial and Parallel Resonance Timing, Resonant Frequency, Bandwidth and Q-Factor Determination for RLC network
3. Time response of first order RC/RL network for periodic non-sinusoidal inputs-time Constant and Steady State error determination.
4. Two port network parameters Z-Y Parameters, chain matrix and analytical verification.
5. Two port network parameters ABCD and h- Parameters
6. Verification of Superposition and Reciprocity theorems.
7. Verification of maximum power transfer theorem. Verification on DC, and AC Excitation With Resistive and Reactive loads.
8. Experimental determination of Thevenin's and Norton's equivalent circuits and Verification by Direct Test.
9. Constant k Low Pass Filter and High Pass Filter -Design and 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. Load Test on Single Phase Transformer.

***Note: Any 12 of the above Experiments have to be conducted.***

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**III YEAR B.TECH.ECE – I SEM**

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**IC APPLICATIONS**

**PART I – LINEAR INTEGRATED CIRCUITS**

**UNIT I**

**INTEGRATED CIRCUITS:** Classification ,Chip Size and Circuit complexity , ideal and practical Op-amp, Op-Amp Characteristics -DC and AC characteristics, 741 op-amp & its features, Mode of Operation- inverting ,Non-inverting, Differential amplifier.

**UNIT II**

**OP-AMPS APPLICATIONS:** Basic Applications of Op-Amp, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Sample and hold circuits, Integrator and differentiator, Comparators, Schmitt Trigger, Multivibrators , Introduction to Voltage Regulators and Features of 723 Voltage Regulators.

**UNIT III**

**Active Filters and Oscillators :** Introduction, Butter worth filters – 1st order, 2nd order LPF, HPF filters. Band pass. Active Band reject and all pass filters. Principles of Operation and types of oscillators- RC , Wein bridge and Quadrature type, waveform generators : Triangular, sawtooth, square wave generators.

**UNIT IV**

**Timers & 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 of 565 PLL, VCO.

**PART 2-DATA CONVERTER INTEGRATED CIRCUITS**

**UNIT V**

**D-A,A-D Converters:** Introduction, basic DAC Techniques,- weighted resistor type, R-2R Ladder type, Inverted R-2R type, Differential types of ADC'S- Parallel comparator type, counter type, successive approximation register type and Dual slope type. ADC and DAC Specifications

**PART 3-DIGITAL INTEGRATED CIRCUITS**

**UNIT VI**

**INTRODUCTION :**Classification of integrated circuits ,Standard TTL NAND Gate-Analysis & Characteristics, TTL Open Collector Outputs, Tristate TTL, MOS & CMOS open drain and tristate outputs, Comparison of various logic families, IC Interfacing – TTL driving CMOS & CMOS Driving TTL

**UNIT VII**

**COMBINATIONAL CIRCUIT ICS:** Use of TTL 74XX Series and CMOS 40XX Series ICS , TTL ICS –Code converters , Decoders, Demultiplexers, Encoders, Priority Encoders,

Multiplexer & their applications, Priority Generators, Arithmetic circuit ICS-Parallel Binary Adder / Subtractor using 2's complement system ,Magnitude Comparator circuits.

**UNIT VIII**

**SEQUENTIAL CIRCUIT ICS:** Commonly Available 74XX and CMOS 40XX Series ICS-RS,JK,JK Master-Slave, D and T Type flipflops and their conversions , synchronous and Asynchronous Counters, Decade Counters , Shift registers & applications.

**TEXT BOOKS:**

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

**REFERENCES:**

1. Modern Digital Electronics - RP Jain - 4/e –TMH ,2010.
2. Operational Amplifiers & Linear Integrated Circuits–R.F.Coughlin & Fredrick Driscoll, PHI, 6th Edition.
3. Micro Electronics – Millman, McGraw Hill,1988.
4. Operational Amplifiers – C.G. Clayton, Butterworth & Company Publ. Ltd./ Elsevier, 1971.

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III YEAR B.TECH.ECE – I SEM

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### CONTROL SYSTEMS

#### UNIT I

**INTRODUCTION:** Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems.

#### UNIT II

**TRANSFER FUNCTION REPRESENTATION:** 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 Representation by Signal flow graph - Reduction using Mason's gain formula.

#### UNIT III

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

#### UNIT IV

**STABILITY ANALYSIS IN S-DOMAIN & Root Locus Technique:** The concept of stability Routh's stability criterion qualitative stability and conditional stability limitations of Routh's stability.

#### **Root Locus Technique:**

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

#### UNIT V

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

#### UNIT VI

**STABILITY ANALYSIS IN FREQUENCY DOMAIN:** Polar Plots-Nyquist Plots-Stability Analysis

#### UNIT VII

**CLASSICAL CONTROL DESIGN TECHNIQUES:** Compensation techniques Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

#### UNIT VIII

**STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS:** Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization-

Solving the Time invariant state Equations- State Transition Matrix and its Properties Concepts of Controllability and Observability

#### **TEXT BOOKS:**

1. Automatic Control Systems 8th edition by B. C. Kuo 2003 John wiley and sonâ.,
2. Control Systems Engineering by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.

#### **REFERENCE BOOKS:**

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

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**III YEAR B.TECH.ECE – I SEM**

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**ANTENNAS & WAVE Propagation**

**UNIT I:**

**Antenna Basics:** Introduction. Basic Antenna Parameters-Patterns, Beam Area, Radiation Intensity. Beam Efficiency, Directivity-Gain-Resolution, Antenna Apertures. Effective Height. Illustrative Problems. Fields from Oscillating Dipole. Field Zones. Shape-Impedance Considerations. Antenna Temperature. Front - to-back Ratio. Antenna Theorems. Radiation-Basic Maxwell's Equations, Retarded Potentials -Helmholtz Theorem.

**UNIT II:**

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

**UNIT III:**

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

Arrays with Parasitic Elements. Yagi-Uda Array. Folded Dipoles and their Characteristics.

**UNIT IV:**

**Non resonant Radiators:** V-antennas, Rhombic Antennas and Design Relations, Helical Antennas - Helical Geometry, Helix Modes, Practical Design Considerations for Monofilar.

**Arrays with Parasitic Elements:** Yagi-Uda Array. Folded Dipoles and their Characteristics.

**UNIT V:**

**Microstrip Antennas:** Introduction, Features, Advantages and Limitations, Rectangular Patch Antennas - Geometry and Parameters, Characteristics of Micro strip Antennas. Impact of Different Parameters on Characteristics. Reflector Antennas - Introduction, Flat Sheet and Corner Reflectors. Paraboloidal Reflectors - Geometry, Pattern Characteristics, Feed Methods, Reflector Types - Related Features, Illustrative Problems.

**UNIT VI:**

**VHF, UHF and Microwave Antennas – II:** Lens Antennas - Introduction, Geometry of Non-metallic Dielectric Lenses. Zoning, Tolerances. Applications. Horn Antennas -Types, Fermat's Principle. Optimum Horns. Design Considerations of Pyramidal Horns, Illustrative Problems.

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

**UNIT VII:**

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

**UNIT VIII:**

**Wave Propagation - II:** Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path. Critical Frequency, MUF. LET. OF, Virtual Height and Skip Distance, Relation between MUF and Skip Distance. Multi-hop Propagation, Energy Loss in Ionosphere, Summary of Wave Characteristics in Different Frequency Ranges.

**TEXT BOOKS:**

1. Antennas and Wave Propagation - J.D. Kraus, R.J. Marhefka and Ahmad S. Khan. TMH, New Delhi, 4<sup>th</sup> ed., (Special
2. Electromagnetic Waves and Radiating Systems - E.C. Jordan and K.G. Bahrain. PHI, 2<sup>nd</sup> e d., 2000.

**REFERENCE BOOKS:**

1. Antenna Theory - C.A. Balanis, John Wiley & Sons, 3<sup>rd</sup> ed.. 2005.
2. Antennas and Wave Propagation - K.D. Prasad, Satya Prakashan, Tech India Publications, New Delhi, 2001.
3. Transmission and Propagation - E.V.D. Glazier and H.R.L. Lamont, The Services Text Book of Radio, vol. 5 Standard Publishers Distributors, Delhi.
4. Electronic and Radio Engineering - EE. Terman, McGraw-Hill, 4<sup>th</sup> edition, 1955.

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III YEAR B.TECH.ECE – I SEM

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4 1/-/- 4

### ANALOG COMMUNICATIONS

#### UNIT I

**INTRODUCTION:** Introduction to communication system, Need for modulation. Amplitude Modulation, Definition, Time domain and frequency domain description, 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. Radio Transmitters-Classification of Transmitters, AM transmitter block diagram and explanation of each block.

#### 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 CONCEPTS:** 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 -Comparison of FM & AM.

#### UNIT V

**ANGLE MODULATION METHODS:** Generation of FM Waves: Direct Method: Parametric Variation Method: Varactor Diode, Reactance Modulator, indirect Method: Armstrong Method, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector. Phase locked loop, Foster Seeley Discriminator, Ratio detector, FM transmitter block diagram and explanation of each block.

#### UNIT VI

**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 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:** Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation & demodulation of PWM, PPM, Generation and demodulation of PPM

#### **TEXT BOOKS:**

1. Principles of Communication Systems H Taub & D. Schilling, Gautam Sahe. TMH, 2007 3rd Edition
2. Principles of Communication Systems - Simon Haykin. John Wiley, 2r" Edition,.

#### **REFERENCE BOOKS:**

1. Electronics & Communication System - George Kennedy and Bernard Davis, 4th Edition TMH 2009
2. Analog Communications- KN Hari Bhat & Ganesh Rao, Pearson Publications, 2nd Edition 2008.
3. Communication Systems Second Edition - R.P. Singh. SP Sapre, TMH, 2007
4. Communication Systems - B.P Lathi, BS Publication, 2006.

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III YEAR B.TECH.ECE – I SEM

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### COMPUTER ORGANIZATION

#### 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 Representation. Floating Point Representation. Error Detection codes.

#### UNIT II

**REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS:** 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.

**CENTRAL PROCESSING UNIT** - Stack organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer

#### UNIT III

**MICRO PROGRAMMED CONTROL:** Control memory, Address sequencing, micro program example, Design of control unit-Hard wired control. Micro programmed control

#### UNIT IV

**COMPUTER ARITHMETIC:** Addition and subtraction, multiplication Algorithms, Division Algorithms, Floating point Arithmetic operations. Decimal Arithmetic unit, Decimal Arithmetic operations.

#### UNIT V

**THE MEMORY SYSTEM:** Memory Hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory, Memory management hardware

#### UNIT VI

**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 VII

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

#### UNIT VIII

**MULTI PROCESSORS:** Characteristics of Multiprocessors, Interconnection Structures, Interprocessor

Arbitration. Interprocessor Communication and Synchronization, Cache Coherence.

#### **TEXT BOOKS:**

1. Computer System Architecture “ M.Moris Mano, IIIrd Edition, PHI / Pearson, 2006.
2. Computer Organization “ Car Hamacher, Zvonks Vranesic, Safwat Zaky, V Edition, McGraw Hill, 2002.

#### **REFERENCE BOOKS:**

1. Computer Organization and Architecture “ William Stallings Seventh Edition, PHI/Pearson, 2006.
2. Computer Architecture and Organization “ John P. Hayes, Mc Graw Hill International editions, 1998

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III YEAR B.TECH.ECE – I SEM

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MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

#### UNIT I

**Introduction to Managerial Economics:** Definition, Nature and Scope of Managerial Economics-Demand Analysis: Demand Determinants, Law of Demand and its exceptions.

#### UNIT II

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

#### UNIT III

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

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

#### UNIT IV

**Introduction to Markets & Pricing Policies:** Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Objectives and Policies of Pricing- Methods of Pricing: Cost Plus Pricing. Marginal Cost Pricing, Sealed Bid Pricing, Going Rate Pricing, Limit Pricing, Market Skimming Pricing, Penetration Pricing. Two-Part Pricing, Block Pricing, Bundling Pricing, Peak Load Pricing, Cross Subsidization.

#### UNIT V

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

#### UNIT VI

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

#### UNIT VII

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

#### UNIT VIII

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

#### **TEXT BOOKS:**

1. Aryasri: Managerial Economics and Financial Analysis, TMH, 2009.
2. Varshney & Maheswari: Managerial Economics, Sultan Chand, 2009.

#### **REFERENCE BOOKS:**

1. Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech.2009.
2. V.Rajasekarn & R.Lalitha. Financial Accounting, Pearson Education. New Delhi. 2010.
3. Suma Damodaran, Managerial Economics, Oxford University Press. 2009.
4. Domnick Salvatore: Managerial Economics in a Global Economy, 4th Edition. Cengage, 2009.

## IC APPLICATIONS LAB

## MINIMUM TWELVE EXPERIMENTS MUST CONDUCT:

(Six from each part A &amp; B)

## PART -1: TO VERIFY THE FOLLOWING FUNCTIONS

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

## PART -2: TO VERIFY THE FOLLOWING FUNCTIONALITY

Of the following 74 series TTL ICS

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

## Equipment required for Laboratories:

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

## ANALOG COMMUNICATIONS LAB

(Minimum 12 Experiments must conduct)

## LIST OF EXPERIMENTS:

1. Amplitude modulation and demodulation
2. DSB-SC Modulator & Detector
3. SSB-Sc Modulator & Detector (Phase Shift Method)
4. Frequency modulation and demodulation.
5. Study of spectrum analyzer and analysis of AM and FM Signals
6. Pre-emphasis & de-emphasis.
7. Time Division Multiplexing & De multiplexing
8. Frequency Division Multiplexing & De multiplexing
9. Verification of Sampling Theorem
10. Pulse Amplitude Modulation & Demodulation
11. Pulse Width Modulation & Demodulation
12. Pulse Position Modulation & Demodulation
13. Frequency Synthesizer.
14. AGC Characteristics.
15. PLL as FM Demodulator

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**DIGITAL COMMUNICATIONS**

**UNIT I**

**Elements of Digital Communication Systems:** Elements of Digital Communication Systems: Model of Digital Communication Systems, Digital Representation of Analog Signal, Certain issues in Digital Transmission, Advantages of Digital Communication Systems, Bandwidth-S/N tradeoff, Hartley Shannon Law, Sampling Theorem

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

**Baseband transmission and Optimal Reception of Digital Signal:** Baseband transmission and Optimal Reception of Digital Signal: Pulse shaping for optimum transmissions. A Baseband Signal Receiver, Probability of Error. Optimum Receiver, optima of Coherent Reception. Signal Space Representation and Probability of Error, eye diagrams, Cross talk.

**UNIT V**

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

**UNIT VI**

**Linear Block Codes:** Linear Block Codes: Matrix description of Linear Block Codes, Error detection and error Correction capabilities of linear block codes. Cyclic Codes: Algebraic structure, encoding, syndrome calculation. Decoding

**UNIT VII**

**Convolution Codes:** Convolution Codes: Encoding. Decoding using State, tree and trellis diagrams. Decoding using Viterbi algorithm. Comparison of Error Rates in Coded and Uncoded Transmission.

**UNIT VIII**

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

**TEXT BOOKS:**

1. Principles of communication systems - Herbert Taub. Donald L Schiling, Goutam Sana, 3rd Edition,McGraw-Hill,2008.
2. Digital and Analog Communicator Systems - Sam Shanmugam, John Wiley, 2005.

**REFERENCE BOOKS:**

1. Digital Communications - John G. Proakis . Masoud salehi “ 5th Edition, McGraw-Hill, 2008.
2. Digital Communication - Simon Haykin, Jon Wiley, 2005.
3. Digital Communications - Ian A. Glover, Peter M. Grant, Edition, Pearson Edu., 2008.
4. Communication Systems-B.P. Lathi, BS Publication, 2006.

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**DIGITAL SIGNAL PROCESSING**

**UNIT I:**

Introduction to Digital Signal Processing: Introduction to Digital Signal Processing: Discrete time signals & sequences, linear shift invariant systems, stability, and causality, linear constant coefficient difference equations. Frequency domain representation of discrete time signals and systems

**UNIT II:**

Discrete Fourier series: DFS representation of Periodic Sequences. Properties of Discrete Fourier Series., Discrete Fourier Transforms: Properties of DFT. linear convolution of sequences using DFT.

Computation of DFT : Over-lap Add method, Over-lap Save method, Relation between DTFT, DFS. DFT and Z- transform.

**UNIT III:**

Fast Fourier Transforms: Fast Fourier transforms (FFT) - Radix-2 decimation-in-time and decimation-in-frequency FFT Algorithms, Inverse FFT and FFT for composite N or general radix N

**UNIT IV:**

Realization of Digital Filters: Applications of Z - transforms, solution of difference equations of digital filters,Block diagram representation of linear constant coefficient difference equations, System function. Stability criterion. Frequency response of stable systems, Realization of digital filters - Direct, Canonic, Transposed forms,Cascade and Parallel forms.

**UNIT V:**

IIR Digital Filters: Analog filter approximations - Butterworth and Chebyshev, Design of IIR Digital filters from analog filters. Step and Impulse invariant techniques. Bilinear transformation method, Spectral transformations.

**UNIT VI:**

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

**UNIT VII:**

Multirate Digital Signal Processing Introduction. Down sampling, Decimation. Up sampling, Interpolation, Sampling Rate Conversion, Implementation of sampling rate conversion. Applications of multi rate signal processing

**UNIT VIII:**

Finite Word Length Effects: Limit cycles. Overflow oscillations. Round-off noise in IIR digital filters. Computational output round off noise. Methods to prevent overflow. Trade off between round off and overflow noise. Measurement of coefficient quantization effects through pole-zero movement. Dead band effects.

**TEXT BOOKS:**

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

**REFERENCE BOOKS:**

- 1 Digital Signal Processing - Fundamentals and Applications - Li Tan, Elsevier. 2008
2. Fundamentals of Digital Signal Processing using Matlab - Robert J. Schilling. Sandra L, Harris, Thomson. 2007
3. Digital Signal Processing - S.Salivahanan. A.Vallavaraj and CGnanapriya.TMH.2009
4. Discrete Systems and Digital Signal Processing with MATLAB -Taan S.EIAlI.CRC press. 2009.

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**MANAGEMENT SCIENCE**

**UNIT I :**

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

**UNIT II:**

**Designing Organisational Structures :** Basic concepts related to Organisation - Departmentation and Decentralisation, Types of mechanistic and organic structures of organisation (Line organization, Line and staff organization, functional organization, Committee organization, matrix organization, Virtual Organisation, Cellular Organisation, team structure, boundaryless organization, inverted pyramid structure, lean and flat organization structure) and their merits, demerits and suitability.

**UNIT III:**

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

**UNIT IV:**

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

**UNIT V:**

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

**UNIT VI:**

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

**UNIT VII:**

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

**UNIT VIII:**

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

**TEXT BOOKS :**

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

**REFERENCE BOOKS :**

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz & Wehrich: Essentials of Management, 6/e, TMH, 2005
3. Thomas N.Duening & John M.Ivancevich Management—Principles and Guidelines, Biztantra,2003.
4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.

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**III YEAR B.TECH.ECE – II SEM**

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**MICROPROCESSOR AND MICRO CONTROLLERS**

**UNIT I**

**8086 Architecture:** Introduction to 8085 Microprocessor, 8086 Architecture-Functional diagram. Register Organization, Memory Segmentation. Programming Mode!. Memory addresses. Physical memory organization. Architecture of 8086, signal descriptions of 8086-common function signals. Minimum and Maximum mode signals. Timing diagrams. Interrupts of 8086.

**UNIT II**

**Instruction Set and Assembly Language Programming of 8086:** Instruction formats, addressing modes, instruction set, assembler directives, macros, simple programs involving logical, branch and call instructions, sorting, evaluating arithmetic expressions, string manipulations.

**UNIT III**

**I/O Interface:** 8255 PPI various modes of operation and interfacing to 8086. Interfacing keyboard, display, stepper motor interfacing, D/A and A/D converter.

**UNIT IV**

**Interfacing with advanced devices:** Memory interfacing to 8086, Interrupt structure of 8086, Vector interrupt table, Interrupt service routine. Introduction to DOS and BIOS interrupts, Interfacing Interrupt Controller 8259 DMA Controller 8257 to 8086.

**UNIT V**

**Communication Interface:** Serial communication standards, Serial data transfer schemes. 8251 USART architecture and interfacing. RS- 232. IEEE-4-88, Prototyping and trouble shooting.

**UNIT VI**

**Introduction to Microcontrollers:** Overview of 8051 microcontroller. Architecture. I/O Ports. Memory organization, addressing modes and instruction set of 8051, simple program

**UNIT VII**

**8051 Real Time Control:** Interrupts, timer/ Counter and serial communication, programming Timer Interrupts, programming external hardware interrupts, programming the serial communication interrupts, programming 8051 timers and counters

**UNIT VIII**

**The AVR RISC microcontroller architecture:** Introduction, AVR Family architecture, Register File, The ALU. Memory access and Instruction execution. I/O memory. EEPROM. I/O ports. Timers. UART. Interrupt Structure

**TEXT BOOKS:**

1. D. V. Hall. Micro processors and Interfacing, TMGH. 2'1 edition 2006.
2. Kenneth. J. Ayala. The 8051 microcontroller , 3rd edition, Cengage learning, 2010

**REFERENCE BOOKS:**

1. Advanced Microprocessors and Peripherals - A. K. Ray and K.M. Bhurchandani, TMH, 2nd edition 2006.
2. The 8051 Microcontrollers, Architecture and programming and Applications -K.Uma Rao, Andhe Pallavi,,Pearson,2009.
3. Micro Computer System 8086/8088 Family Architecture. Programming and Design - y Liu and GA Gibson, PHI,2nd Ed.,
4. Microcontrollers and application, Ajay. V. Deshmukh, TMGH. 2005

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III YEAR B.TECH.ECE – II SEM

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ADVANCED DATA STRUCTURES  
(OPEN ELECTIVE)

**Unit I :**

C++ Class Overview- Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, parameter passing methods, Inline functions, static class members, this pointer, friend functions, dynamic memory allocation and deallocation (new and delete), exception handling.

**Unit II :**

Function Over Loading, Operator Overloading, Generic Programming- Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control, runtime polymorphism using virtual functions, abstract classes, streams I/O.

**Unit III :**

Algorithms, performance analysis- time complexity and space complexity. Review of basic data structures- The list ADT, Stack ADT, Queue ADT, Implementation using template classes in C++.

**Unit IV :**

Dictionaries, linear list representation, skip list representation, operations insertion, deletion and searching, hash table representation, hash functions, collision resolution-separate chaining, open addressing-linear probing, quadratic probing, double hashing, rehashing, extendible hashing, comparison of hashing and skip lists.

**Unit V :**

Priority Queues – Definition, ADT, Realizing a Priority Queue using Heaps, Definition, insertion, Deletion, External Sorting- Model for external sorting, Multiway merge, Polyphase merge.

**Unit VI :**

Search Trees (Part1):-

Binary Search Trees, Definition, ADT, Implementation, Operations- Searching, Insertion and Deletion, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching

**Unit VII :**

**Search trees (prt II) :** Introduction to Red –Black and Splay Trees, B-Trees, B-Tree of order m, height of a B-Tree, insertion, deletion and searching, Comparison of Search Trees

**Unit VIII :**

**Pattern matching and Tries :** Pattern matching algorithms-Brute force, the Boyer –Moore algorithm, the Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

**TEXT BOOKS :**

1. Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd, 2nd edition, Universities Press Orient Longman Pvt. Ltd.
2. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student edition, John Wiley and Sons.

**REFERENCES :**

1. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second Edition.
2. Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4. Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

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**III YEAR B.TECH.ECE –II SEM**

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**OBJECT ORIENTED PROGRAMMING  
(OPEN ELECTIVE)**

**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, coping with complexity, abstraction mechanisms.

**UNIT II:**

Java Basics History of Java, Java buzzwords, data types, variables, scope and life time of variables, arrays, operators, expressions, control statements, type conversion and casting, simple java program, concepts of classes, objects, constructors, methods, access control, this keyword, garbage collection, overloading methods and constructors, parameter passing, recursion, nested and inner classes, exploring string class.

**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, the Object class.

**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 java. io.

**UNIT V:**

Exception handling Concepts of exception handling, benefits of exception handling, Termination or resumptive models, exception hierarchy, usage of try, catch, throw, throws and finally, built in exceptions, creating own exception sub classes. tring handling, Exploring java.util

**UNIT VI:**

Multithreading Differences between multi threading and multitasking, thread life cycle, creating threads, thread priorities, synchronizing threads, interthread communication, thread groups, daemon threads. Enumerations, auto boxing, annotations ,generics.

**UNIT VII:**

Event Handling Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes. The AWT class hierarchy, user interface components- labels, button, canvas, scrollbars, text components, check box, check box groups, choices, lists panels, scrollpane, dialogs, menubar, graphics, layout manager, layout managertypes border, grid, flow, card and grid bag.

**UNIT VIII:**

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.

**TEXT BOOKS:**

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

**REFERANCE BOOKS:**

1. An Introduction to programming and OO design using Java, J.Nino and F.A. Hosch, John wiley & sons.
2. An Introduction to OOP, third edition, T. Budd, pearson education.
3. Introduction to Java programming , Y. Daniel Liang, pearson education.
4. An introduction to Java programming and object oriented application development, R.A. Johnson- Thomson.

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OPERATING SYSTEMS  
(OPEN ELECTIVE)

**UNIT I:**

**Operating Systems Overview:** Operating Systems Overview- Operating systems functions. Overview of computer operating systems, protection and security, distributed systems, special purpose systems, operating systems structures-operating system services and systems calls, system programs, operating system structure. Operating systems generation.

**UNIT II:**

**Process Management:** Process Management - Process concepts, threads, scheduling-criteria, algorithms, and their evaluation .Thread scheduling, case studies Unix. Linux. Windows

**UNIT III:**

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

**UNIT IV:**

**Memory Management:** Memory Management - Swapping, contiguous memory allocation, paging, structure of the page table , segmentation, virtual memory, demand paging, page-replacement, algorithms .Allocation of frames, Thrashing case studies Unix. Linux. Windows.

**UNIT V:**

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

**UNIT VI:**

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

**UNIT VII:**

**Mass-storage structure & I/O systems:** Mass-storage structure- overview of Mass-storage structure. Disk structure, disk attachment, disk scheduling, swap-space management. RAID structure, stable-storage implementation. Tertiary storage structure. I/O systems- Hardware, application I/o interface, kernel I/O subsystem, Transforming I/O requests to Hardware operations. STREAMS, performance.

**UNIT VIII:**

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

**TEXT BOOKS:**

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

**REFERENCE BOOKS:**

1. Operating Systems - Internals and Design Principles. Stallings, sixth Edition-2009. Pearson education.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition PHI.
3. Principles of Operating Systems , B.L.Stuart. Cengage learning, India Edition.
4. Operating Systems. A.S.Godboie.2nd Edition, TMH.

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DIGITAL SIGNAL PROCESSING LAB

LIST OF EXPERIMENTS:

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

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MICROPROCESSORS AND MICROCONTROLLER LAB

(Any Twelve Experiments)

LIST OF EXPERIMENTS:

1. Programs for 16 bit arithmetic operations for 8086 (using Various Addressing Modes).
2. Program for sorting an array for 8086.
3. Program for searching for a number or character in a string for 8086.
4. Program for string manipulations for 8086.
5. Program for digital clock design using 8086.
6. Interfacing ADC and DAC to 8086.
7. Parallel communication between two microprocessors using 8255.
8. Serial communication between two microprocessor kits using 8251.
9. Interfacing to 8086 and programming to control stepper motor.
10. Programming using arithmetic, logical and bit manipulation instructions of 8051.
11. Program and verify Timer/ Counter in 8051.
12. Program and verify Interrupt handling in 8051
13. UART Operation in 8051.
14. Communication between 8051 kit and PC.
15. Interfacing LCD to 8051.
16. Interfacing Matrix/ Keyboard to 8051.
17. Data Transfer from Peripheral to Memory through DMA controller

## ADVANCED ENGLISH COMMUNICATION SKILLS LAB

## 1. Introduction

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

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

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

## 2. Objectives:

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

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

## 3. Syllabus:

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

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes, prefixes and suffixes, study of word origin, analogy, idioms and phrases.

- Group Discussion – dynamics of group discussion, intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

## 4. Minimum Requirement:

The English Language Lab shall have two parts:

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

## System Requirement ( Hardware component):

Computer network with Lan with minimum 60 multimedia systems with the following specifications:

P – IV Processor

- a) Speed – 2.8 GHZ
- b) RAM – 512 MB Minimum
- c) Hard Disk – 80 GB

ii) Headphones of High quality

## 5. Suggested Software:

The software consisting of the prescribed topics elaborated above should be procured and used.

## Suggested Software:

- **Clarity Pronunciation Power** – part II
- **Oxford Advanced Learner's Compass**, 7<sup>th</sup> Edition
- **DELTA's key to the Next Generation TOEFL Test: Advanced Skill Practice.**
- **Lingua TOEFL CBT Insider**, by Dreamtech
- **TOEFL & GRE( KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)**
- **The following software from 'train2success.com'**

- **Preparing for being Interviewed,**
  - **Positive Thinking,**
  - **Interviewing Skills,**
  - **Telephone Skills,**
  - **Time Management**
  - **Team Building,**
  - **Decision making**
- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

#### 6. Books Recommended:

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

#### DISTRIBUTION AND WEIGHTAGE OF MARKS:

##### *Advanced Communication Skills Lab Practicals:*

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