2007-2008

JAWAHRLAL NEHRU TECHNOLOGICAL UNIVERSITY,
KAKINADA

B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING I

YEAR
COURSE STRUCTURE

<table>
<thead>
<tr>
<th>Code</th>
<th>Subject</th>
<th>T</th>
<th>P/ D</th>
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<tbody>
<tr>
<td></td>
<td>English</td>
<td>2+1</td>
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<td></td>
<td>Mathematics - I</td>
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<td>C Programming and Data Structures</td>
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<td>Engineering Drawing</td>
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### B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING

#### COURSE STRUCTURE

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#### II YEAR II Semester

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<tr>
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# B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING

## COURSE STRUCTURE

### III Year

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<td>Linear IC Applications</td>
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<td>Digital IC Applications</td>
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<td></td>
<td>Management Science</td>
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<td>Telecommunication Switching Systems</td>
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<td>Digital Signal Processing</td>
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<td>VLSI Design</td>
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<td>Microwave Engineering</td>
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* **T**: Lecture Hours
  * **P**: Practical Hours
  * **C**: Credit Hours
### B.TECH. ELECTRONICS AND COMMUNICATION ENGINEERING

#### IV Year

<table>
<thead>
<tr>
<th>Course Structure</th>
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<tr>
<td><strong>Code</strong></td>
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<tr>
<td></td>
<td>Computer Networks</td>
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<td>Electronic Measurements &amp; Instrumentation</td>
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<td>Cellular and Mobile Communications</td>
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<td>Radar Systems</td>
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<td>Micro Controllers and Applications</td>
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<td>Television Engineering</td>
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<td>Microwave and Optical Communications Lab.</td>
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#### II Semester

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<tr>
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<td>Optical Communications</td>
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<td>Embedded and Real Time Systems</td>
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<td>Bio-Medical Instrumentation</td>
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<td>Digital Design Through Verilog</td>
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<td>Elective-IV</td>
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<td>Wireless Communications and Networks</td>
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<td>DSP Processors and Architectures</td>
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<td>Artificial Neural Networks</td>
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<td>Industry Oriented Mini Project</td>
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<td>Seminar</td>
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<td>Project Work</td>
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<td>Comprehensive Viva</td>
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**Note:** All End Examinations (Theory and Practical) are of three hours duration.

* - Tutorial  
T – Theory  
P – Practical  
C – Credits  
D – Drawing
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

1. INTRODUCTION:
In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of Engineering students. The prescribed books and the exercises are meant to serve broadly as students’ handbooks. In the English classes, the focus should be on the skills of reading, writing, listening and speaking and for this the teachers should use the text prescribed for detailed study. For example, the students should be encouraged to read the texts/selected paragraphs silently. The teachers can ask comprehension questions to stimulate discussion and based on the discussions students can be made to write short paragraphs/essays etc. The text for non-detailed study is for extensive reading/reading for pleasure by the students. Hence, it is suggested that they read it on their own with topics selected for discussion in the class. The time should be utilized for working out the exercises given after each section, as also for supplementing the exercises with authentic materials of a similar kind for example, from newspaper articles, advertisements, promotional material etc. However, the stress in this syllabus is on skill development and practice of language skills.

2. OBJECTIVES:
a. To improve the language proficiency of the students in English with emphasis on LSRW skills.
b. To equip the students to study academic subjects with greater facility through the theoretical and practical components of the English syllabus.
c. To develop the study skills and communication skills in formal and informal situations.

3. SYLLABUS:
Listening Skills:
Objectives
1. To enable students to develop their listening skill so that they may appreciate its role in the LSRW skills approach to language and improve their pronunciation
2. To equip students with necessary training in listening so that can comprehend the speech of people of different backgrounds and regions

Students should be given practice in listening to the sounds of the language to be able to recognise them, to distinguish between them to mark stress and recognise and use the right intonation in sentences.
- Listening for general content
- Listening to fill up information
- Intensive listening
- Listening for specific information

Speaking Skills:
Objectives
1. To make students aware of the role of speaking in English and its contribution to their success.
2. To enable students to express themselves fluently and appropriately in social and professional contexts.

- Oral practice
- Describing objects/situations/people
- Role play - Individual/Group activities (Using exercises from all the nine units of the prescribed text:
  Learning English : A Communicative Approach.)
- Just A Minute(JAM) Sessions.

Reading Skills:
Objectives
1. To develop an awareness in the students about the significance of silent reading and comprehension.
2. To develop the ability of students to guess the meanings of words from context and grasp the overall message of the text, draw inferences etc.

• Skimming the text
• Understanding the gist of an argument
• Identifying the topic sentence
• Inferring lexical and contextual meaning
• Understanding discourse features
• Recognizing coherence/sequencing of sentences

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

Writing Skills:
Objectives
1. To develop an awareness in the students about writing as an exact and formal skill
2. To equip them with the components of different forms of writing, beginning with the lower order ones.

• Writing sentences
• Use of appropriate vocabulary
• Paragraph writing
• Coherence and cohesiveness
• Narration / description
• Note Making
• Formal and informal letter writing
• Editing a passage

4. TEXTBOOKS PRESCRIBED:
In order to improve the proficiency of the student in the acquisition of the four skills mentioned above, the following texts and course content, divided into Eight Units, are prescribed:

For Detailed study

   (Six Selected Lessons)

For Non-detailed study

A. STUDY MATERIAL:
Unit –I


Unit –II


Unit –III


Unit –IV


Unit –V

Unit – VI


* Exercises from the lessons not prescribed shall also be used for classroom tasks.

Unit – VII

Exercises on
Reading and Writing Skills
Reading
Comprehension
Situational dialogues
Letter writing
Essay writing

Unit – VIII

Practice Exercises on Remedial Grammar covering
Common errors in English, Subject-Verb agreement, Use of Articles and Prepositions, Tense and aspect
Vocabulary development covering
Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

REFERENCES:
1. Strengthen Your English, Bhaskaran & Horsburgh, Oxford University Press
3. Murphy’s English Grammar with CD, Murphy, Cambridge University Press
4. English Skills for Technical Students by Orient Longman
    Publications.
7. A Hand book of English for Engineers & Technologists by Dr. P. Eliah, B. S.
    Publications.
8. Developing Communication Skills by Krishna Mohan & Meera Benerji (Macmillan)
10. The Oxford Guide to Writing and Speaking, John Seely, Oxford
UNIT - I

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

UNIT - III
Rolle’s Theorem – Lagrange’s Mean Value Theorem – Cauchy’s mean value Theorem – Generalized Mean Value theorem (all theorems without proof) Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints and without constraints

UNIT - IV
Radius, Centre and Circle of Curvature – Evolutes and Envelopes Curve tracing – Cartesian, polar and Parametric curves.

UNIT - V
Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates multiple integrals - double and triple integrals – change of variables – change of order of integration.

UNIT - VI
Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy’s root test – Raabe’s test – Absolute and conditional convergence

UNIT - VII

UNIT - VIII

Text Books:

Reference:
UNIT –
I
Matrices and Linear systems of equations: Elementary row transformations-Rank-Echelon form,
Normal form – Solution of Linear Systems – Direct Methods- LU Decomposition- LU Decomposition
from Gauss Elimination – Solution of Tridiagonal Systems-Solution of Linear Systems

UNIT –
II
Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem - Inverse and powers of a
matrix by Cayley-Hamilton theorem – Diagonalization of matrix. Calculation of powers of matrix –
Modal and spectral matrices.

UNIT –
III
Real matrices – Symmetric, skew - symmetric, orthogonal, Linear Transformation –
Orthogonal Transformation. Complex matrices: Hermitian, Skew-Hermitian and Unitary – Eigen values and
eigen vectors of complex matrices and their properties. Quadratic forms- Reduction of
quadratic form to canonical form – Rank - Positive, negative definite - semi definite - index - signature - Sylvester law.

UNIT –
IV
Method of
False Position – The Iteration Method – Newton-Raphson
Method.

Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward
Differences- Backward differences –Central differences – Symbolic relations and separation of
symbols-Differences of a polynomial-Newton's formulae for interpolation – Central difference
interpolation Formulae – Gauss Central Difference Formulae –Interpolation with unevenly spaced
points-Lagrange’s Interpolation formula.

UNIT –
V
Curve fitting: Fitting a straight line –Second degree curve-exponential curve-power curve by
method of least squares. Numerical Differentiation and Integration- Trapezoidal rule –
Simpson's 1/3 Rule –Simpson's 3/8
Rule
.

UNIT –
VI
Numerical solution of Ordinary Differential equations: Solution by Taylor’s series-Picard’s
Method of successive Approximations-Euler’s Method-Runge-Kutta Methods –Predictor-
Corrector Methods- Adams-
Moulton Method –Milne’s
Method.

UNIT –
VII
Fourier Series: Determination of Fourier coefficients – Fourier series – even and odd functions –
Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier
sine and cosine expansions. Fourier integral theorem (only statement) – Fourier sine and cosine
integrals. Fourier transform - Fourier sine and cosine transforms – properties – inverse
transforms – Finite Fourier transforms.

UNIT –
VIII
Formation of partial differential equations by elimination of arbitrary constants and arbitrary
functions – solutions of first order linear (Lagrange) equation and nonlinear (standard
type) equations. Method of separation of variables. z-transform – inverse z-transform -
properties – Damping rule – Shifting rule – Initial and final value theorems. Convolution theorem – Solution of difference equation by z-transforms.

**Text Books:**

**References:**
UNIT I

**BONDING IN SOLIDS**: Introduction - Types of bonding in solids - Estimation of cohesive energy - Madelung constant.


UNIT II

**PRINCIPLES OF QUANTUM MECHANICS**: Waves and particles - Planck’s quantum theory - de Broglie hypothesis - Matter waves - Davisson and Germer experiment - G. P. Thomson experiment - Heisenberg uncertainty principle - Schrödinger's time independent wave equation - Physical significance of the wave function - Particle in one dimensional potential box.

UNIT III

**ELECTRON THEORY OF METALS**: Classical free electron theory - Mean free path - Relaxation time and drift velocity - Quantum free electron theory - Fermi-Dirac distribution (analytical) and its dependence on temperature - Fermi energy - Electron scattering and resistance.

**BAND THEORY OF SOLIDS**: Bloch theorem - Kronig-Penney model (qualitative treatment) - Origin of energy band formation in solids - Classification of materials into conductors, semi conductors & insulators - Concept of effective mass of an electron.

UNIT IV

**DIELECTRIC PROPERTIES**: Introduction - Dielectric constant - Electronic, ionic and orientational polarizations - Internal fields in solids - Clausius - Mossotti equation - Dielectrics in alternating fields - Frequency dependence of the polarizability - Ferro and Piezo electricity.

**MAGNETIC PROPERTIES**: Permeability - Magnetization - Origin of magnetic moment - Classification of magnetic materials - Dia, para and ferro magnetism - Hysteresis curve - Soft and hard magnetic materials. **UNIT V**

**SEMICONDUCTORS**: Introduction - Intrinsic semiconductor and carrier concentration - Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein’s equation - Hall effect - Direct & indirect band gap semiconductors.

**SUPERCONDUCTIVITY**: General properties - Meissner effect - Penetration depth - Type I and Type II superconductors - Flux quantization - DC and AC Josephson effect - BCS Theory - Applications of superconductors.

UNIT VI


UNIT VII

**FIBER OPTICS AND HOLOGRAPHY**: Introduction - Principle of optical fiber - Acceptance angle and acceptance cone - Numerical aperture - Types of optical fibers and refractive index profiles - Attenuation in optical fibers - Application of optical fibers - Basic principles of holography - Construction and reconstruction of image on hologram - Applications of holography.
UNIT VIII

TEXTBOOKS:
2. Introduction to Solid State Physics by C. Kittel; Wiley Eastern Ltd.
3. Nanotechnology by Mark Ratner and Daniel Ratner; Pearson Education.

REFERENCES:
1. Materials Science and Engineering by V. Raghavan; Prentice-Hall India.
2. Materials Science by M. Arumugam; Anuradha Agencies.
C PROGRAMMING AND DATA STRUCTURES

UNIT -
I
Algorithm / pseudo code, flowchart, program development steps, structure of C program, A Simple C program, identifiers, basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bitwise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation.

Input-output statements, statements and blocks, if and switch statements, loops- while, do-while and for statements, break, continue, goto and labels, programming examples.

UNIT -
II
Designing structured programs, Functions, basics, parameter passing, storage classes- extern, auto, register, static, scope rules, block structure, user defined functions, standard library functions, recursive functions, header files, C preprocessor, example c programs.

UNIT -
III
Arrays- concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two- dimensional and multi-dimensional arrays, applications of arrays. pointers- concepts, initialization of pointer variables, pointers and function arguments, address arithmetic, Character pointers and functions, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, c program examples.

UNIT -
IV
Derived types- structures- declaration, definition and initialization of structures, accessing structures, nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, typedef, bitfields, C program examples.

UNIT -
V
Input and output – concept of a file, text files and binary files, streams, standard I/o, Formatted I/o, file I/o operations, error handling, C program examples.

UNIT -
VI
Searching – Linear and binary search methods, sorting – Bubble sort, selection sort, Insertion sort, Quick sort, merge sort.

UNIT -
VII
Introduction to data structures, singly linked lists, doubly linked lists, circular list, representing stacks and queues in C using arrays and linked lists, infix to post fix conversion, postfix expression evaluation.

UNIT -
VIII
Trees- Binary tress, terminology, representation, traversals, graphs- terminology, representation, graph traversals (dfs & bfs)

TEXT BOOKS :

REFERENCES :
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
UNIT – I Introduction to Electrical Circuits

UNIT – II AC Circuits - I
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 self and mutual inductances – co-efficient of coupling series circuit analysis with mutual inductance.

UNIT – III A.C Circuits - II
Resonance – series, parallel circuits, concept of band width and Q factor.
Three phase circuits: Phase sequence – Star and delta connection – Relation between line and phase voltages and currents in balanced systems – Calculations of active and reactive power.

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

UNIT – V Network Theorems
Tellegens, Superposition, Reciprocity, Thevinin’s, Norton’s, Max Power Transfer theorem. Millman’s Theorem – Statement and proofs problem solving using dependent and independent sources for d.c and a.c excitation.

UNIT – VI Two-port networks

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

UNIT – VIII Filters

TEXT BOOKS:

REFERENCES:
4. Electrical circuits by A.Chakarborthy, Dhanpath Rai & Co.,
UNIT-I
ELECTRON DYNAMICS AND CRO: Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection), Parallel Electric and Magnetic fields, Perpendicular Electric and Magnetic fields.

UNIT-II
JUNCTION DIODE CHARACTERISTICS: Review of semi conductor Physics – n and p -type semi conductors, Mass Action Law, Continuity Equation, Hall Effect, Fermi level in intrinsic and extrinsic semiconductors, Open-circuited p-n junction, The p-n junction Energy band diagram of PN diode, PN diode as as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Volt-ampere characteristics of p-n diode, Temperature dependence of VI characteristic, Transition and Diffusion capacitances, Step graded junction, Breakdown Mechanisms in Semi Conductor (Avalanche and Zener breakdown) Diodes, Zener diode characteristics, Characteristics of Tunnel Diode with the help of energy band diagrams, Varactor Diode, LED, LCD. And photo diode

UNIT-III
RECTIFIERS, FILTERS AND REGULATORS: Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter, - section filter, Multiple L- section and Multiple section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

UNIT-IV
TRANSISTOR and FET CHARACTERISTICS: Junction transistor, Transistor current components, Transistor as an amplifier, Transistor construction, Detailed study of currents in a transistor, Transistor alpha, Input and Output characteristics of transistor in Common Base, Common Emitter, and Common collector configurations, Relation between Alpha and Beta, typical transistor junction voltage values, JFET characteristics (Qualitative and Quantitative discussion), Small signal model of JFET, MOSFET characteristics (Enhancement and depletion mode), Symbols of MOSFET, Comparison of Transistors, Introduction to SCR and UJT.

UNIT-V
BIASING AND STABILISATION: BJT biasing, DC equivalent model, criteria for fixing operating point, Fixed bias, Collector to base bias, Self bias techniques for stabilization, Stabilization factors, (S, S’, S”), Compensation techniques, (Compensation against variation in VBE, Ic,) Thermal run away, Thermal stability,

UNIT-VI
AMPLIFIERS: Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of transistor configurations in terms of $A_I$, $R_I$, $A_V$, $R_O$,

UNIT-VII
FEEDBACK AMPLIFIERS: Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on input and output characteristics, Voltage series, voltage shunt, current series, and current shunt feedback amplifiers with discrete components and their analysis

UNIT-VIII
OSCILLATORS: Condition for oscillations. RC-phase shift oscillators with Transistor and FET, Hartley and Colpitts oscillators, Wein bridge oscillator, Crystal oscillators, Frequency and amplitude stability of oscillators,

TEXT BOOKS:

REFERENCES:
5. Electronic Devices and Circuits - Prof GS N Raju ! K International Publishing House Pvt .Ltd 2006
UNIT – I
Introduction to engineering graphics - construction of ellipse, parabola and hyperbola - cylindrical curves.

UNIT – II
Orthographic projections of points, lines and planes - axis inclined to one planes and inclined to both the planes.

UNIT – III
Orthographic projections of solids:
Cylinder, cone, prism, pyramid and sphere positions and axis inclined to both the planes.

UNIT – IV
Isometric projections of lines, planes and simple solids

UNIT – V
Conversion of orthographic views into isometric views and vice-versa.

TEXT BOOKS:
1. Engineering drawings By N.D.Bhatt
2. Engineering graphics By K.L. Narayana & P.Kannayya

REFERENCES:
1. Engineering drawing and graphics: Venugopal/ New age
2. Engineering drawing : Johle / TMH
Objective
s:
To make the student learn a programming language.
To teach the student to write programs in C solve the problems
To introduce the student to simple linear and non-linear data structures such as lists, stacks, queues, trees and graphs.

Recommended Systems/Software
Requirements:

- Intel based desktop PC
- ANSI C Compiler with Supporting Editors

Week 1
a) Write a C program to find the sum of individual digits of a positive integer.
b) A Fibonacci Sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
c) Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

Week 2
a) Write a C program to calculate the following
   \[ \text{Sym} = \frac{-x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \frac{x^{10}}{10!} \]
b) Write a C program to find the roots of a quadratic equation.

Week 3
a) Write C programs that use both recursive and non-recursive functions
   i) To find the factorial of a given integer.
   ii) To find the GCD (greatest common divisor) of two given integers.
   iii) To solve Towers of Hanoi problem.

Week 4
a) The total distance travelled by vehicle in t seconds is given by distance \( = ut + \frac{1}{2}at^2 \)
   where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec\(^2\)). Write C program to find the distance travelled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculations for different values of 'u' and 'a'.
b) Write a C program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement)

Week 5
a) Write a C program to find both the largest and smallest number in a list of integers.
b) Write a C program that uses functions to perform the following:
   i) Addition of Two Matrices
   ii) Multiplication of Two Matrices

Week 6
a) Write a C program that uses functions to perform the following operations:
   i) To insert a sub-string in to given main string
from a given position. ii) To delete n Characters from a given position in a given string.

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

Week 7

a) Write a C program that displays the position or index in the string S where the string T begins, or -1 if S doesn’t contain T.

b) Write a C program to count the lines, words and characters in a given text.
Week 8
a) Write a C program to generate Pascal's triangle.
b) Write a C program to construct a pyramid of numbers.

Week 9
Write a C program to read in two numbers, x and n, and then compute the sum of this geometric progression:
1+x+x^2+x^3+...........+x^n
For example: if n is 3 and x is 5, then the program computes
1+5+25+125. Print x, n, the sum
Perform error checking. For example, the formula does not make sense for negative exponents - if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal? If so, test for them too.

Week 10
a) 2's complement of a number is obtained by scanning it from right to left and complementing all the bits after the first appearance of a 1. Thus 2's complement of 11100 is 00100. Write a C program to find the 2's complement of a binary number.
b) Write a C program to convert a Roman numeral to its decimal equivalent.

Week 11
Write a C program that uses functions to perform the following operations:
   i) Reading a complex number
   ii) Writing a complex number
   iii) Addition of two complex numbers
   iv) Multiplication of two complex numbers
(Note: represent complex number using a structure.)

Week 12
a) Write a C program which copies one file to another.
b) Write a C program to reverse the first n characters in a file. (Note: The file name and n are specified on the command line.)

Week 13
Write a C program that uses functions to perform the following operations on singly linked list:
   i) Creation   ii) Insertion   iii) Deletion   iv) Traversal

Week 14
Write a C program that uses functions to perform the following operations on doubly linked list:
   i) Creation   ii) Insertion   iii) Deletion   iv) Traversal in both ways

Week 15
Write C programs that implement stack (its operations) using i) Arrays    ii) Pointers

Week 16
Write C programs that implement Queue (its operations) using i) Arrays    ii) Pointers
Week 17
Write a C program that uses Stack operations to perform the following:
   i) Converting infix expression into postfix expression
   ii) Evaluating the postfix expression

Week 18
Write a C program that uses functions to perform the following:
   i) Creating a Binary Tree of integers
   ii) Traversing the above binary tree in preorder, inorder and postorder.

Week 19
Write C programs that use both recursive and non recursive functions to perform the following searching operations for a Key value in a given list of integers:
   i) Linear search  ii) Binary search

Week 20
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
   i) Bubble sort  ii) Quick sort

**Week 21**
Write C programs that implement the following sorting methods to sort a given list of integers in ascending order:
   i) Insertion sort  ii) Merge sort

**Week 22**
Write C programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.

**Week 23**
Write C programs to implement the linear regression and polynomial regression algorithms.

**Week 24**
Write C programs to implement Trapezoidal and Simpson methods.

**Text Books**
Objective:
The IT Workshop for engineers is a 6 training lab course spread over 90 hours. The modules include training on PC Hardware, Internet & World Wide Web and Productivity tools including Word, Excel, Power Point and Publisher.

PC Hardware introduces the students to a personal computer and its basic peripherals, the process of assembling a personal computer, installation of system software like MS Windows, Linux and the required device drivers. In addition hardware and software level troubleshooting process, tips and tricks would be covered.

Internet & World Wide Web module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced. Productivity tools module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX.

PC Hardware

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

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

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

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

Week 5 – Task 5: Several mini tasks would be that covers Basic commands in Linux and Basic system administration in Linux which includes: Basic Linux commands in bash, Create hard and symbolic links, Text processing, Using wildcards.

Week 6 – Task 6: Hardware Troubleshooting: Students have to be given a PC which does not boot due to improper assembly or defective peripherals. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Week 7 – Task 7: Software Troubleshooting: Students have to be given a malfunctioning CPU due to system software problems. They should identify the problem and fix it to get the computer back to working condition. The work done should be verified by the instructor and followed up with a Viva.

Week 8 – Task 8: The test consists of various systems with Hardware / Software related troubles, Formatted disks without operating systems.

Internet & World Wide Web

Week 9 - Task 1: Orientation & Connectivity Boot Camp: Students should get connected to their Local Area Network and access the Internet. In the process they configure the TCP/IP setting. Finally students should demonstrate to the instructor, how to access the websites and email. If there is no internet connectivity preparations need to be made by the instructors to simulate the WWW on the LAN.

Week 10 - Task 2: Web Browsers, Surfing the Web: Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.
Week 11 - Task 3: Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.
**Week 12 - Task 4: Cyber Hygiene**: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti-virus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop-ups, block active x downloads to avoid viruses and/or worms.

**Week 13 Module Test**: A test which simulates all of the above tasks would be crafted and given to the students.

**LaTeX and Word**

**Week 14 - Word Orientation**: The mentor needs to give an overview of LaTeX and Microsoft/ equivalent (FOSS) tool word: Importance of LaTeX and MS/ equivalent (FOSS) tool word as word Processors, Details of the four tasks and features that would be covered in each, Using LaTeX and word - Accessing, overview of toolbars, saving files, Using help and resources, rulers, format painter in word.

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

**Week 15 - Task 2: Creating project** abstract Features to be covered:- Formatting Styles, Inserting table, Bullets and Numbering, Changing Text Direction, Cell alignment, Footnote, Hyperlink, Symbols, Spell Check, Track Changes.

**Week 16 - Task 3: Creating a Newsletter**: Features to be covered:- Table of Content, Newspaper columns, Images from files and clipart, Drawing toolbar and Word Art, Formatting Images, Textboxes and Paragraphs

**Week 17 - Task 4: Creating a Feedback form**: Features to be covered:- Forms, Text Fields, Inserting objects, Mail Merge in Word.

**Week 18 - LaTeX and Word Module Test**: Replicate the given document inclusive of all features

**Excel**

**Week 19 - Excel Orientation**: The mentor needs to tell the importance of MS/ equivalent (FOSS) tool Excel as a Spreadsheet tool, give the details of the four tasks and features that would be covered in each. Using Excel - Accessing, overview of toolbars, saving excel files, Using help and resources.

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

**Week 20 - Task 2: Calculating GPA**: Features to be covered:- Cell Referencing, Formulae in excel - average, std.deviation, Charts, Renaming and Inserting worksheets, Hyperlink, Count function, LOOKUP/VLOOKUP

**Week 21 - Task 3: Performance Analysis**: Features to be covered:- Split cells, freeze panes, group and outline, Sorting, Boolean and logical operators, Conditional formatting

**Week 22 - Task 4: Cricket Score Card**: Features to be covered:- Pivot Tables, Interactive Buttons, Importing Data, Data Protection, Data Validation

**Week 23 - Excel Module Test**: Replicate the given document inclusive of all features

**LaTeX and MS/equivalent (FOSS) tool Power Point**

**Week 24 - Task 1**: Students will be working on basic power point utilities and tools which help them create basic power point presentation. Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both
LaTeX and Powerpoint.

**Week 25 - Task 2**: Second week helps students in making their presentations interactive. Topic covered during this week includes: Hyperlinks, Inserting - Images, Clip Art, Audio, Video, Objects, Tables and Charts

**Week 26 - Task 3**: Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation. Topic covered during this week includes: Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting - Background, textures, Design Templates, Hidden slides.
Week 27 - Task 4: Entire week concentrates on presentation part of LaTeX and power point. Topic covered during this week includes - Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing

Week 28 - Task 5: Power point test would be conducted. Students will be given model power point presentation which needs to be replicated (exactly how it’s asked).

Publisher
Week 29: Help students in preparing their personal website using Microsoft/ equivalent (FOSS) tool publisher. Topic covered during this week includes - Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

REFERENCES:
1. Comdex Information Technology course tool kit Vikas Gupta, WILEY Dreamtech
3. Introduction to Information Technology, ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase PHI (Microsoft)
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. All LaTeX and others related material is available at
(a) www.sssolutions.in and
(b) www.sontisoftsolutions.org
PART A: (Only for viva voce Examination)
ELECTRONIC WORKSHOP PRACTICE ( in 6 lab sessions):
1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches
   (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Lowpower JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of
   • Multimeters (Analog and Digital)
   • Function Generator
   • Regulated Power Supplies
      1. Study and Operation of CRO.

PART B: (For Laboratory examination – Minimum of 16 experiments)
1. PN Junction diode characteristics A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Transistor CB characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Rectifier without filters (Full wave & Half wave)
6. Rectifier with filters (Full wave & Half wave)
7. FET characteristics
8. Measurement of h parameters of transistor in CB, CE, CC configurations
9. CE Amplifier
10. CC Amplifier (Emitter Follower).
12. FET amplifier (Common Source)
13. Wien Bridge Oscillator
14. RC Phase Shift Oscillator
15. Feed back amplifier (Current Series).
16. Feed back amplifier (Voltage Series).
17. Hartley Oscillator.
18. Colpitts Oscillator.
19. SCR characteristics.

PART C:
Equipment required for Laboratories:
1. Regulated Power supplies (RPS) - 0-30v
2. CROs - 0-20 M Hz.
3. Function Generators - 0-1 M Hz.
4. Multimeters
5. Decade Resistance Boxes/Rheostats
6. Decade Capacitance Boxes
7. Micro Ammeters (Analog or Digital) - 0-20 µA, 0-50 µA, 0-100 µA, 0-200 µA
8. Voltmeters (Analog or Digital) - 0-50V, 0-100V, 0-250V
9. Electronic Components - Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs, FETs, LEDs, MOSFETs, diodes (ge & sitype), transistors (nnp & pnp type)
The Language Lab focuses on the production and practice of sounds of language and familiarises the students with the use of English in everyday situations and contexts.

Objectives:
1. To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
2. To help the students cultivate the habit of reading passages from the computer monitor, thus providing them with the required facility to face computer-based competitive exams such as GRE, TOEFL, GMAT etc.
3. To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
4. To train them to use language effectively to face interviews, group discussions, public speaking.
5. To initiate them into greater use of the computer in resume preparation, report writing, format making etc.

SYLLABUS:
The following course content is prescribed for the English Language Laboratory sessions:
1. Introduction to the Sounds of English- Vowels, Diphthongs & Consonants.
2. Introduction to Stress and Intonation.
3. Situational Dialogues / Role Play.
5. ‘Just A Minute’ Sessions (JAM).
6. Describing Objects / Situations / People.
7. Information Transfer
8. Debate
10. Giving Directions.

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:

i) P - IV
   Processor a)
   Speed - 2.8 GHZ
b) RAM - 512 MB
   Minimum c) Hard
   Disk - 80 GB
ii) Headphones of High quality

Suggested Software:
- Cambridge Advanced Learners’ English Dictionary with CD.
- The Rosetta Stone English Library
- Clarity Pronunciation Power – Part I
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd with CD.
- Oxford Advanced Learner's Compass, 7th Edition
- Learning to Speak English - 4 CDs
- Microsoft Encarta with CD
- Murphy's English Grammar, Cambridge with CD

Books Suggested for English Language Lab Library (to be located within the lab in addition to the CDs of the text book which are loaded on the systems):
1. **Spoken English** (CIEFL) in 3 volumes with 6 cassettes, OUP.
3. **Spoken English** - R. K. Bansal and J. B. Harrison, Orient Longman
   2006 Edn.
4. **English Language Communication : A Reader cum Lab Manual** Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayanan, Anuradha Publications, Chennai
5. **Speaking English Effectively** by Krishna Mohan & NP Singh
   (Macmillan)
7. **A text book of English Phonetics for Indian Students** by T.Balasubramanian
   (Macmillan)
8. **English Skills for Technical Students,** WBSCTE with British Council, OL

**DISTRIBUTION AND WEIGHTAGE OF MARKS**

**English Language Laboratory Practical Paper:**
1. The practical examinations for the English Language Laboratory shall be conducted as per the University norms prescribed for the core engineering practical sessions.
2. For the Language lab sessions, there shall be a continuous evaluation during the year for 25 sessional marks and 50 year-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 year-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.
UNIT – I


UNIT – II


UNIT – III

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

UNIT – IV


UNIT – V


UNIT – VI

Residue – Evaluation of residue by formula and by Laurent series - Residue theorem. Evaluation of integrals of the type

(a) Improper real integrals $\int f(x)dx$

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

(c) $\int e^{imx} f(x)dx$

(d) Integrals by identification.

UNIT – VII


UNIT – VIII

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.

Text Books:


References:

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, Bayes’ Theorem, 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,

UNIT
III
OPERATION ON ONE RANDOM VARIABLE – EXPECTATIONS : 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, Transformation of a
Discrete 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

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, Jointly Gaussian
Random Variables: Two Random Variables case, N Random Variable case, Properties,
Transformations of
Multiple Random Variables, Linear Transformations of Gaussian Random
Variables.

UNIT VI
RANDOM PROCESSES – TEMPORAL CHARACTERISTICS : The Random Process Concept,
Classification of Processes, Deterministic and Non-deterministic Processes, Distribution and
Density Functions, concept of Stationarity and Statistical Independence. First-Order Stationary Processes, Second- Order and
Wide-Sense
Stationarity, (N-Order) and Strict-Sense Stationarity, Time Averages and Ergodicity, Mean-Ergodic
Processes, Correlation-Ergodic Processes, Autocorrelation Function and Its Properties, Cross-
Correlation Function and Its Properties, Covariance Functions, Gaussian Random Processes,
Poisson Random Process.

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

UNIT
VIII
LINEAR SYSTEMS WITH RANDOM INPUTS : Random Signal Response of Linear Systems:
TEXT BOOKS :


REFERENCES :

UNIT -
I
Multidisciplinary nature of Environmental Studies: Definition, Scope and Importance - Need for Public Awareness

UNIT -
II
Natural Resources: Renewable and non-renewable resources - Natural resources and associated problems
- Forest resources - Use and over-exploitation, deforestation, case studies - Timber extraction - Mining, dams and other effects on forest and tribal people - Water resources - Use and over-utilization of surface and ground water - Flooods, drought, conflicts over water, dams - benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. - Energy resources: Growing energy needs, renewable and non-renewable energy sources use of alternate energy sources. Case studies. Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable lifestyles.

UNIT -
III
Ecosystems: Concept of an ecosystem. - Structure and function of an ecosystem. - Producers, consumers and decomposers. - Energy flow in the ecosystem - Ecological succession. - Food chains, food webs and ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:
- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT -
IV

UNIT -
V
Environmental Pollution: Definition, Cause, effects and control measures of:
- a. Air pollution
- b. Water pollution
- c. Soil pollution
- d. Marine pollution
- e. Noise pollution
- f. Thermal pollution
- g. Nuclear hazards

Solid waste Management: Causes, effects and control measures of urban and industrial
wastes. - Role of an individual in prevention of pollution. - Pollution case studies. - Disaster management: floods, earthquake, cyclone and landslides.

UNIT VI


UNIT VII
**Human Population and the Environment**: Population growth, variation among nations.
Population explosion
- HIV/AIDS.
- Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies

**UNIT**

**VIII**

**Field work**: Visit to a local area to document environmental assets River / forest grassland/hill/mountain - Visit to a local polluted site-Urban/Rural/industrial/ Agricultural Study of common plants, insects, birds. - Study of simple ecosystems-pond, river, hill slopes, etc.

**TEXT BOOK:**

1. Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for
   Grants Commission.
2. Environmental Studies by R. Rajagopalan, Oxford University Press.

**REFERENCE:**

1. Textbook of Environmental Sciences and Technology by M. Anji Reddy, BS Publication.
UNIT I
SIGNAL ANALYSIS: Analogy between vectors and signals, Orthogonal signal space, Signal approximation using orthogonal functions, Mean square error, Closed or complete set of orthogonal functions, Orthogonality in complex functions, Exponential and sinusoidal signals, Concepts of Impulse function, Unit step function, Signum function.

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

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

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

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

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

UNIT VII
LAPLACE TRANSFORMS: Review of Laplace transforms, Partial fraction expansion, Inverse Laplace transform, Concept of region of convergence (ROC) for Laplace transforms, constraints on ROC for various classes of signals, Properties of L.T's relation between L.T's, and F.T. of a signal. Laplace transform of certain signals using waveform synthesis.

UNIT VIII
TEXT BOOKS:

REFERENCES:
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA
II Year B.Tech. ECE. I-Sem

UNIT I
DC MACHINES: Principle of operation of DC Machines- EMF equation - Types of generators - Magnetization and load characteristics of DC generators

UNIT II
D.C. MOTORS: DC Motors - Types of DC Motors - Characteristics of DC motors - 3-point starters for DC shunt motor - Losses and efficiency - Swinburne’s test - Speed control of DC shunt motor - Flux and Armature voltage control methods.

UNIT III
TRANSFORMERS: Principle of operation of single phase transformer - types - Constructional features - Phasor diagram on No Load and Load - Equivalent circuit

UNIT IV
PERFORMANCE OF TRANSFORMERS: Losses and Efficiency of transformer and Regulation - OC and SC tests - Predetermination of efficiency and regulation (Simple Problems).

UNIT V
THREE PHASE INDUCTION MOTOR: Principle of operation of three-phase induction motors - Slip ring and Squirrel cage motors - Slip-Torque characteristics - Efficiency calculation - Starting methods.

UNIT VI

UNIT VII
SINGLE PHASE INDUCTION MOTORS: Principle of operation - Shaded pole motors - Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors - Characteristics.

UNIT VIII
ELECTRICAL INSTRUMENTS: Basic Principles of indicating instruments - Moving Coil and Moving iron Instruments (Ammeters and Voltmeters)

TEXT BOOKS:

REFERENCES:
3. Essentials of Electrical and Computer Engineering - David V. Kernels, JR. J. David Irwin

UNIT II : MULTI STAGE AMPLIFIERS : Multi Stage Amplifiers Methods of Inter Stage Coupling, n – Stage Cascaded Amplifier, Equivalent Circuits, Miller’s Theorem, Frequency Effects, Amplifier Analysis, High Input Resistance Transistor Circuits. Cascade – Transistor Configuration, CE-CC Amplifiers, Two Stage RC Coupled JFET amplifier (in Common Source (CS) configuration), Difference Amplifier.

UNIT III: HIGH FREQUENCY TRANSISTOR CIRCUITS : Transistor at High Frequencies, Hybrid-Common Emitter Tranconductance Model, Determination of Hybrid- Conductances, Variation of Hybrid Parameters with [IC], [VCE] and Temperature. The Parameters \( \alpha \), expression for \( \beta \), Current Gain with Resistance Load, CE Short Circuit Current Gain, Hybrid– p) Parameters, Measurement of \( \alpha \), Variation of Hybrid – Parameters with Voltage, Current and Temperature, Design of High frequency Amplifier.


UNIT VI : TUNED AMPLIFIERS - II : Stagger Tuning, Stability Considerations, Tuned Class B and Class C Amplifiers, Wideband Amplifiers, Tuned Amplifiers.


UNIT VIII : SWITCHING AND IC VOLTAGE REGULATORS : IC 723 Voltage Regulators and Three Terminal IC regulators, DC to DC Converter, Switching Regulators, Voltage Multipliers, UPS, SMPS.

TEXT BOOKS :

REFERENCES :
ELECTRONIC CIRCUITS LAB

List of Experiments (Twelve experiments to be done):
I) Design and Simulation in Simulation Laboratory using Multisim OR Pspice OR Equivalent Simulation

Software. (Any Six):  
1. Common Emitter and Common Source amplifier 
2. Two Stage RC Coupled Amplifier 
3. Current shunt and Feedback Amplifier 
4. Cascade Amplifier 
5. Wien Bridge Oscillator using Transistors 
6. RC Phase Shift Oscillator using Transistors 
7. Class A Power Amplifier (Transformer less) 
8. Class B Complementary Symmetry Amplifier 
9. High Frequency Common base (BJT) / Common gate(JFET) Amplifier. II) Testing in the Hardware Laboratory (Six Experiments : 3 + 3) :  
A) Any Three circuits simulated in Simulation laboratory 
B) Any Three of the following 
   1. Class A Power Amplifier (with transformer load) 
   2. Class B Power Amplifier 
   3. Single Tuned Voltage Amplifier 
   4. Series Voltage Regulator 
   5. Shunt Voltage Regulator 

Equipments 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) Simulations software (Multisim/TINAPRO) Package 

2. For Hardware simulations of Electronic Circuits  
   i) RPSs ii) CROs 
   iii) Functions Generators iv) Multimeters 
   v) Components
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ELECTRICAL TECHNOLOGY LAB

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

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

Note: Any TEN of the above experiments are to be conducted
UNIT I
LINEAR WAVE SHAPING: High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, attenuators, its applications in 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, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clamps.

UNIT III
SWITCHING CHARACTERISTICS OF DEVICES: Diode as a switch, piecewise linear diode characteristics, Transistor as a switch, Break down voltage, consideration of transistor, saturation parameters of Transistor and their variation with temperature, Design of transistor switch, transistor-switching times.

UNIT IV

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, Current time base generators.

UNIT VI
Synchronization and Frequency Division: Principles of Synchronization, Frequency division in sweep circuit, Astable relaxation circuits, Monostable relaxation circuits, Synchronization of a sweep circuit with symmetrical signals, Sine wave frequency division with a sweep circuit.

UNIT VII
SAMPLING GATES: Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Applications of sampling gates.

UNIT VIII
REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS: AND, OR gates using Diodes, Resistor, Transistor Logic, Diode Transistor Logic.

TEXT BOOKS:

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

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

UNIT IV STABILITY ANALYSIS IN S-DOMAIN
The concept of stability - Routh’s stability criterion - qualitative stability and conditional stability - limitations of Routh’s stability

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

UNIT 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
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 it’s Properties – Concepts of Controllability and Observability

TEXT BOOKS:
1. Automatic Control Systems 8th edition – by B. C. Kuo 2003– John wiley and son’s,

REFERENCE BOOKS:
UNIT-I
Introduction: Creation of Java, importance of Java to internet, byte code, Java buzzwords, OOP Principles, Encapsulation, Inheritance and Polymorphism, data types, variables, declaring variables, dynamic initialization, scope and life time of variables, arrays, operators, control statements, type conversion and casting, compiling and running of simple Java program.

UNIT-II
Classes and Objects: Concepts of classes and objects, class fundamentals Declaring objects, assigning object reference variables, introducing methods, constructors, usage of static with data and methods, usage of final with data, access control, this key word, garbage collection, overloading methods and constructors, parameter passing – call by value, recursion, nested classes and inner classes, exploring the String class.

UNIT-III
Inheritance: Basic concepts, member access rules, usage of super key word, forms of inheritance, method overriding, abstract classes, dynamic method dispatch, using final with inheritance, 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.

UNIT-V
Exception Handling and Multithreading: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes, Concepts of Multithreading, differences between process and thread, thread life cycle, creating multiple threads using Thread class, Runnable interface, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

UNIT-VI
Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling mouse and keyboard events, Adapter classes.

AWT: Concepts of components, container, panel, window, frame, canvas, Font class, Color class and Graphics.

UNIT-VII


UNIT-VIII
Networking and Java Library: Basics of Networking, Inetaddress, TCP/IP sockets, Datagrams, URL, URL connection, String handling, java.util, java.io and java.net.
packages.

TEXT BOOKS :

REFERENCES :
5. Java, Somasundaram, Jaico.
SWITCHING THEORY AND LOGIC DESIGN

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

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

UNIT IV
COMBINATIONAL LOGIC DESIGN
Design using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design using IC chips, MUX Realization of switching functions Parity bit generator, Codeconverters, 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 - I: 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 Weighing machine and Binary multiplier.

TEXTBOOKS:

REFERENCES:
Review of Coordinate Systems, Vector Calculus:

UNIT I


UNIT II


UNIT III


UNIT IV


UNIT V


UNIT V


UNIT VII


UNIT VIII


TEXT BOOKS:

REFERENCES:
ANALOG COMMUNICATIONS

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

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

UNIT III

UNIT IV

UNIT V

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

UNIT VII

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

TEXTBOOKS:

REFERENCES:
Minimum 12 experiments should be conducted:
1. Amplitude modulation and demodulation.
2. Diode detector characteristics.
3. Frequency modulation and demodulation.
5. Pre-emphasis & de-emphasis.
8. Phase locked loop.
10. SSB system.
12. Squelch Circuit.
14. AGC Characteristics.

Equipment required for Laboratories:
1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. RF Generators - 0 – 1000 M Hz./ 0 – 100 M Hz.
5. Multimeters
6. Lab Experimental kits for Analog Communication
7. Components
8. Radio Receiver/TV Receiver Demo kits or Trainees.
9. Spectrum Analyzer - 60 M Hz.
Minimum Twelve experiments to be conducted:
1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clampers.
4. Transistor as a switch.
5. Study of Logic Gates & Some applications.
6. Study of Flip-Flops & some applications.
7. Sampling Gates.
8. Astable Multivibrator.
12. UJT Relaxation Oscillator.

Equipment required for Laboratories:
1. RPS - 0 – 30 V
2. CRO - 0 – 20 M Hz.
3. Function Generators - 0 – 1 M Hz
4. Components
5. Multi Meters
UNIT I

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, 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)-termination of Break-Even Point (simple problems)-Managerial Significance and limitations of BEA.

UNIT IV
INTRODUCTION TO MARKETS & PRICING STRATEGIES: Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies

UNIT V

UNIT VI

UNIT VII

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

TEXTBOOKS:

REFERENCES:
2. Financial Accounting - Schaum's Outlines, Shim &Siegel, TMH, 2/E,2004
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

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

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

TEXT BOOKS:

REFERENCE:
LINEAR IC APPLICATIONS

UNIT I

UNIT II

UNIT III

UNIT IV
NON-LINEAR APPLICATIONS OF OP-AMPS: Non-Linear function generation, Comparators, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

UNIT V

UNIT VI

UNIT VII
D to A & A to D CONVERTERS: Introduction, basic DAC techniques, weighted resistor DAC, R-2R ladder DAC, inverted R-2R DAC, and IC 1408 DAC, Different types of ADCs - parallel comparator type ADC, counter type ADC, successive approximation ADC and dual slope ADC. DAC and ADC Specifications, Specifications AD 574 (12 bit ADC).

UNIT VIII
ANALOG MULTIPLIERS AND MODULATORS: Four Quadrant multiplier, balanced modulator, IC 1496, Applications of analog switches and Multiplexers, Sample & Hold amplifiers.

TEXT BOOKS:

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

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

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

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

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

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

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

UNIT VIII
MEMORIES: ROMs: Internal structure, 2D-decoding commercial types, timing and applications. Static RAM: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS. Dynamic RAM: Internal structure, timing, synchronous DRAMs. Familiarity with Component Data Sheets – Cypress CY6116,CY7C1006, Specifications.

TEXT BOOKS:

REFERENCES:
4. Cypress Semiconductors Data Book(Download from website).
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ANTENNAS AND WAVE PROPAGATION

UNIT I  
ANTENNA FUNDAMENTALS: Introduction, Radiation Mechanism – single wire, 2 wire, dipoles, Current Distribution on a thin wire antenna. Antenna Parameters: Radiation Patterns, Patterns in Principal Planes, Main Lobe and Side Lobes, Beamwidths, Beam Area, Radiation Intensity, Beam Efficiency, Directivity, Gain and Resolution, Antenna Apertures, Aperture Efficiency, Effective Height. Related Problems.

UNIT II  
Thin Linear Wire Antennas: Retarded Potentials, Radiation from Small Electric Dipole, Quarterwave Monopole and Halfwave Dipole – Current Distributions, Evaluation of Field Components, Power Radiated, Radiation Resistance, Beamwidths, Directivity, Effective Area and Effective Height. Natural current distributions, fields and patterns of Thin Linear Center-fed Antennas of different lengths, Radiation Resistance at a point which is not current maximum. Antenna Theorems – Applicability and Proofs for equivalence of directional characteristics, Loop Antennas: Small Loops – Field Components, Comparison of far fields of small loop and short dipole, Concept of short magnetic dipole, D and Rr relations for small loops.

UNIT III  
ANTENNA ARRAYS: 2 element arrays – different cases, Principle of Pattern Multiplication, N element Uniform Linear Arrays – Broadside, Endfire Arrays, EFA with Increased Directivity, Derivation of their characteristics and comparison; Concept of Scanning Arrays. Directivity Relations (no derivations). Related Problems. Binomial Arrays, Effects of Uniform and Non-uniform Amplitude Distributions, Design Relations.

UNIT IV  
NON-RESONANT RADIATORS: Introduction, Travelling wave radiators – basic concepts, Longwire antennas – field strength calculations and patterns, V-antennas, Rhombic Antennas and Design Relations, Broadband Antennas: Helical Antennas – Significance, Geometry, basic properties; Design considerations for monofilar helical antennas in Axial Mode and Normal Modes (Qualitative Treatment).

UNIT V  

UNIT VI  
VHF, UHF AND MICROWAVE ANTENNAS - II: Horn Antennas – Types, Optimum Homs, Design Characteristics of Pyramidal Horns; Lens Antennas – Geometry, Features, Dielectric Lenses and Zoning, Applications. Antenna Measurements – Patterns Required, Set Up, Distance Criterion, Directivity and Gain Measurements (Comparison, Absolute and 3-Antenna Methods).

UNIT VII  

UNIT VIII  

TEXT BOOKS:  
REFERENCES:
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DIGITAL COMMUNICATIONS

UNIT I
PULSE DIGITAL MODULATION: Elements of digital communication systems, advantages of digital communication systems, Elements of PCM: Sampling, Quantization & Coding, Quantization error, Companding in PCM systems. Differential PCM systems (DPCM).

UNIT II
DELTA MODULATION: Delta modulation, its draw backs, adaptive delta modulation, comparison of PCM and DM systems, noise in PCM and DM systems.

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

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

UNIT V
INFORMATION THEORY: Discrete messages, concept of amount of information and its properties. Average information, Entropy and its properties. Information rate, Mutual information and its properties.

UNIT VI

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

UNIT VIII

TEXT BOOKS:
1. Digital communications - Simon Haykin, John Wiley, 2005

REFERENCES:
1. Pulse Amplitude Modulation and demodulation.
2. Pulse Width Modulation and demodulation.
4. Sampling Theorem – verification.
5. Time division multiplexing.
6. Pulse code modulation.
7. Differential pulse code modulation.
8. Delta modulation.
10. Phase shift keying.

Equipment required for Laboratories:
1. RPS - 0 – 30 V
2. CRO - 0 – 20 MHz.
3. Function Generators - 0 – 1 MHz
4. RF Generators - 0 – 1000 MHz./0 – 100 MHz.
5. Multimeters
6. Lab Experimental kits for Digital Communication
7. Components
8. Radio Receiver/TV Receiver Demo kits or Trainees.
Minimum Twelve Experiments to be conducted : (Six from each)

part A & B) Part A (IC Application Lab):

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

Part B (ECAD Lab):

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

1. D Flip-Flop 7474
2. Decade counter-7490
3. shift registers-7495 7
4. 3-8 Decoder -74138
5. 4 bit Comparator-7485
6. 8 x 1 Multiplexer -74151 and 2x4 Demultiplexer-74155
7. RAM (16x4)-74189 (Read and Write operations)

Equipment required for Laboratories:

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

For Software Simulation

1 Computer Systems
2 LAN Connection (Optional)
3 Operating Systems
4 VHDL/ VERILOG
5 FPGAS/CPLDS (Download Tools)
MANAGEMENT SCIENCE


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, dements 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 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)


TEXT BOOKS :

REFERENCES :
1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz &Wehrich: Essentials of Management, 6/e, TMH, 2005
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

III Year B.Tech. ECE. II-Sem

TELECOMMUNICATION SWITCHING SYSTEMS

UNIT I
TELECOMMUNICATION SWITCHING SYSTEMS: Introduction, Elements of switching systems, switching network configuration, principles of cross bar switching.

UNIT II
Electronic space division switching, Time division switching, Combination switching.

UNIT III
TELEPHONE NETWORKS: Subscriber loop systems, switching hierarchy and routing, transmission plan, numbering plan, charging plans.

UNIT IV
SIGNALLING TECHNIQUES: In channel signaling, common channel signaling. Network traffic load and parameters, grade of service and blocking probability.

UNIT V
DATA COMMUNICATION NETWORKS: Introduction, network architecture, layered network architecture, protocols, data communications hardware, data communication circuits.

UNIT VI
Public switched data networks, connection oriented & connection less service, Circuit Switching, packet switching and virtual circuit switching concepts, OSI reference model, LAN, WAN, MAN & Internet. Repeaters, Bridges, Routers and gateways.

UNIT VII
INTEGRATED SERVICES DIGITAL NETWORK (ISDN): Introduction, motivation, ISDN architecture, ISDN interfaces, functional grouping, reference points, protocol architecture, signaling, numbering, addressing, BISDN.

UNIT VIII

TEXT BOOKS:

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

UNIT II

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

UNIT IV
REALIZATION OF DIGITAL FILTERS: Review of Z-transforms, Applications of Z - transforms, solution of difference equations of digital filters, Block diagram representation of linear constant-coefficient difference equations, Basic structures of IIR systems, Transposed forms, Basic structures of FIR systems, System function,

UNIT V
IIR DIGITAL FILTERS: Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Design Examples: Analog-Digital transformations

UNIT VI
FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques, Frequency Sampling technique, Comparison of IIR & FIR filters.

UNIT VII
MULTIRATE DIGITAL SIGNAL PROCESSING: Decimation, interpolation, sampling rate conversion, Implementation of sampling rate conversion.

UNIT VIII
INTRODUCTION TO DSP PROCESSORS: Introduction to programmable DSPs: Multiplier and multiplier Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory, multiport memory, VLSI Architecture, Pipelining, Special addressing modes, On-chip Peripherals,Architecture of TMS 320C5X- Introduction, Bus Structure, Central Arithmetic Logic Unit, Auxiliary Registrar, Index Registrar, Auxiliary Register Compare Register, Block Move Address Register, Parallel Logic Unit, Memory mapped registers, program controller, Some flags in the status registers, On-chip registers, On-chip peripherals

TEXT BOOKS:

Reference
Books:
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

III Year B.Tech. ECE. II-Sem

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VLSI DESIGN

UNIT I
INTRODUCTION : Introduction to IC Technology - MOS, PMOS, NMOS, CMOS & BiCMOS technologies- Oxidation, Lithography, Diffusion, Ion implantation, Metallisation, Encapsulation, Probe testing, Integrated Resistors and Capacitors.

UNIT II
BASIC ELECTRICAL PROPERTIES : Basic Electrical Properties of MOS and BiCMOS Circuits: Ids-Vds relationships, MOS transistor threshold Voltage, gm, gds, figure of merit o; Pass transistor, NMOS Inverter, Various pull ups, CMOS Inverter analysis and design, Bi-CMOS Inverters.

UNIT III

UNIT IV
GATE LEVEL DESIGN : Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations -- Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

UNIT V
SUBSYSTEM DESIGN : Subsystem Design, Shifters, Adders, ALUs, Multipliers, Parity generators, Comparators, Zero/One Detectors, Counters, High Density Memory Elements.

UNIT VI
SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN : PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach.

UNIT VII

UNIT VIII

TEXTBOOKS :

REFERENCES :
JAWAHAR LAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA
III Year B.Tech. ECE. II-Sem

2007-2008

MICROWAVE ENGINEERING


UNIT IV

UNIT V

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

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

UNIT VII

UNIT VIII

TEXT BOOKS:

REFERENCES:
UNIT-I

UNIT-II
Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-III

UNIT-IV

UNIT-V

UNIT-VI
Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

UNIT-VII
Advanced Micro Processors - Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

UNIT-VIII
8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

TEXT BOOKS:

REFERENCES:
## MICROPROCESSORS AND INTERFACING LAB

### I. Microprocessor 8086:
1. Introduction to MASM/TASM.
2. Arithmetic operations - Multi-byte Addition and Subtraction, Multiplication and Division - Signed and unsigned arithmetic operations, ASCII - arithmetic operations.
3. Logic operations - Shift and rotate - Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) - Display characters, Strings.

### II. Interfacing:
1. 8259 - Interrupt Controller: Generate an interrupt using 8259 timer.
2. 8279 - Keyboard Display: Write a small program to display a string of characters.
3. 8255 - PPI: Write ALP to generate sinusoidal wave using PPI.
4. 8251 - USART: Write a program in ALP to establish Communication between two processors.

### III. Microcontroller 8051
1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.

### Equipment required for Laboratories:
1. 8086 µP Kits
2. 8051 Micro Controller kits
3. Interfaces/peripheral subsystems
   - 8259 PIC
   - 8279- KB/Display
   - 8255 PPI
   - 8251 USART
4. ADC Interface
5. DAC Interface
6. Traffic Controller Interface
7. Elevator Interface
1. **Introduction:** The introduction of the English Language Lab is considered essential at 3rd 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:

- 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.

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
- iv) 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, 7th Edition
DELTA’s key to the Next Generation TOEFL Test: Advanced Skill Practice. Lingua TOEFL CBT Insider, by Dreamtech
TOEFL & GRE( KAPLAN, ARCO & 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:

5. English Language Communication : A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof SA Sankaranarayan, Anuradha Publications, Chennai
8. Books on TOEFL/GRE/GMAT/CAT by Barron’s/cup
9. IELTS series with CDs by Cambridge University Press.
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.
UNIT –
I
Introduction : OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks
, Arpanet, Internet, Network Topologies WAN, LAN, MAN.

UNIT - II
Physical Layer : Transmission media copper, twisted pair wireless, switching and encoding
asynchronous communications; Narrow band, broad band ISDN and ATM.

UNIT - III
Data link layer : Design issues, framing, error detection and correction, CRC, Elementary
Protocol-stop and wait, Sliding Window, Slip, Data link layer in HDLC, Internet, ATM.

UNIT - IV
Medium Access sub layer : ALOHA, MAC addresses, Carrier sense multiple access. IEEE 802.X
Standard Ethernet, wireless LANS. Bridges,

UNIT - V
Network Layer : Virtual circuit and Datagram subnets-Routing algorithm shortest path
routing, Flooding, Hierarchical routing, Broad cast, Multi cast, distance vector routing.

UNIT – VI
Principles – of Congestion prevension policies. Internet working: The Network layer in the internet and
in the ATM Networks.

UNIT – VII
Transport Layer: Transport Services, Connection management, TCP and UDP protocols; ATM AAL
Layer Protocol.

UNIT – VIII
Application Layer – Network Security, Domain name system, SNMP, Electronic Mail; the World WEB,
Multi Media.

TEXT BOOKS :

REFERENCES :

Signal Generator- fixed and variable, AF oscillators, Standard and AF sine and square wave signal generators, Function Generators, Square pulse, Random noise, sweep, Arbitrary waveform.

Wave Analyzers, Harmonic Distortion Analyzers, Spectrum Analyzers, Digital Fourier Analyzers.

Oscilloscopes CRT features, vertical amplifiers, horizontal deflection system, sweep, trigger pulse, delay line, sync selector circuits, simple CRO, triggered sweep CRO, Dual beam CRO, Measurement of amplitude and frequency.

Dual trace oscilloscope, sampling oscilloscope, storage oscilloscope, digital readout oscilloscope, digital storage oscilloscope, Lissajous method of frequency measurement, standard specifications of CRO, probes for CRO- Active & Passive, attenuator type, Frequency counter, Time and Period measurement.


Transducers- active & passive transducers : Resistance, Capacitance, inductance; Strain gauges, LVDT, Piezo Electric transducers, Resistance Thermometers, Thermocouples, Thermistors, Sersistors.

Measurement of physical parameters force, pressure, velocity, humidity, moisture, speed, proximity and displacement. Data acquisition systems.


IV Year B.Tech. ECE I-Sem

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CELLULAR AND MOBILE COMMUNICATIONS

UNIT I

UNIT II
ELEMENTS OF CELLULAR RADIO SYSTEM DESIGN : General description of the problem, concept of frequency channels, Co-channel Interference Reduction Factor, desired C/I from a normal case in an omni directional Antenna system, Cell splitting, consideration of the components of Cellular system.

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

UNIT IV
CELL COVERAGE FOR SIGNAL AND TRAFFIC : Signal reflections in flat and hilly terrain, effect of human made structures, phase difference between direct and reflected paths, constant standard deviation, straight line path loss slope, general formula for mobile propagation over water and flat open area, near and long distance propagation antenna height gain, form of a point to point model.

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

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

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

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

TEXTBOOKS :

REFERENCES :
UNIT I
Introduction Nature of Radar, Maximum Unambiguous Range, Radar Waveforms, Simple form of Radar

UNIT II

UNIT III

UNIT IV

UNIT V

UNIT VI

UNIT VII

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

TEXT BOOKS:

REFERENCES:
UNIT I

UNIT II
8051 FAMILY MICROCONTROLLERS INSTRUCTION SET: Basic assembly language programming – Data transfer instructions – Data and Bit-manipulation instructions – Arithmetic instructions – Instructions for Logical operations on the test among the Registers, Internal RAM, and SFRs – Program flow control instructions – Interrupt control flow.

UNIT III
REAL TIME CONTROL: INTERRUPTS: Interrupt handling structure of an MCU – Interrupt Latency and Interrupt deadline – Multiple sources of the interrupts – Non-maskable interrupt sources – Enabling or disabling of the sources – Polling to determine the interrupt source and assignment of the priorities among them – Interrupt structure in Intel 8051.

UNIT IV
REAL TIME CONTROL: TIMERS: Programmable Timers in the MCU’s – Free running counter and real time control – Interrupt interval and density constraints.

UNIT V

UNIT VI
REAL TIME OPERATING SYSTEM FOR MICROCONTROLLERS: Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers.

UNIT VII
16-BIT MICROCONTROLLERS: Hardware – Memory map in Intel 80196 family MCU system – IO ports – Programmable Timers and High-speed outputs and input captures – Interrupts instructions.

UNIT VIII
ARM 32 Bit MCUs: Introduction to 16/32 Bit processors – ARM architecture and organization – ARM / Thumb programming model – ARM / Thumb instruction set – Development tools.

TEXT BOOKS:

REFERENCES:
UNIT I

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

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

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

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

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

UNIT VII

UNIT VIII

TEST BOOKS:
REFERENCES:
UNIT I

UNIT II

UNIT III

UNIT IV
Principles of deadlock – deadlock prevention, detection and avoidance dining philosophers problem – example System s.

UNIT V
Memory Management: Memory Management requirements – loading programmes in to main memory – virtual memory – hardware and Control structures – OS Software – Examples of Memory Management.

UNIT VI

UNIT VII

UNIT VIII

TEXT BOOKS :

REFERENCES :
1. Operating Systems A design approach- Crowley,TMH.
UNIT I

UNIT II

UNIT III
Image enhancement Point processing. Histogram processing. Spatial filtering.

UNIT IV
Enhancement in frequency domain, Image smoothing, Image sharpening.

UNIT V
Colour image processing : Pseudo colour image processing, full colour image processing.

UNIT VI

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

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

TEXT BOOK :

REFERENCES :
IV Year B.Tech. ECE. I-Sem

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SATELLITE COMMUNICATIONS
(ELECTIVE – II)

UNIT I

UNIT II

UNIT III

UNIT IV
SATELLITE LINK DESIGN[1] : Basic transmission theory, system noise temperature and G/T ratio, Design of down links, up link design, Design of satellite links for specified C/N, System design example.

UNIT V
MULTIPLE ACCESS[1][2] : Frequency division multiple access (FDMA) Intermodulation, Calculation of C/N. Time division Multiple Access (TDMA) Frame structure, Examples. Satellite Switched TDMA Onboard processing, DAMA, Code Division Multiple access (CDMA), Spread spectrum transmission and reception.

UNIT VI

UNIT VII
LOW EARTH ORBIT AND GEO-STATIONARY SATELLITE SYSTEMS[1] : Orbit consideration, coverage and frequency considerations, Delay & Throughput considerations, System considerations, Operational NGSO constellation Designs

UNIT VIII

TEXT BOOKS :
1. Satellite Communications – Timothy Pratt, Charles Bostian and Jeremy Alnutt, WSE, Wiley Publications,
2. Satellite Communications Engineering – Wilbur L. Pritchard, Robert A Nelson and Henri G.Suyderhoud,

REFERENCES :
UNIT –
I

UNIT –
II

UNIT –
III
Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries – Correlated Nested Queries Set – Comparison Operators – Aggregative Operators – NULL values – Comparison using Null values – Logical connectivity’s – AND, OR and NOTR – Impact on SQL Constructs – Outer Joins – Disallowing NULL values – Complex Integrity Constraints in SQL 0 Triggers and Active Data bases.

UNIT –
IV
Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition

UNIT –
V

UNIT –
VI
Concurrency Control: Serializability, and recoverability – Introduction to Lock Management – Lock Conversions
- Dealing with Dead Locks – Specialized Locking Techniques – Concurrency without Locking.

Crash recovery: Introduction to ARIES – the Log – Other Recovery related Structures – the Write-Ahead Log Protocol
- Check pointing – re3covering from a System Crash – Media recovery – Other approaches and Interaction with Concurrency control.

UNIT –
VII
Overview of Storage and Indexing: Data on External Storage – File Organization and Indexing
- Cluster Indexes, Primary and Secondary Indexes - Index data Structures - Hash Based Indexing - Tree based Indexing - Comparison of File Organizations - Indexes and Performance Tuning.

UNIT —

VIII

TEXT BOOKS:

REFERENCES:
1. Introduction to Database Systems, C.J.Date Pearson Education
Minimum Twelve Experiments to be conducted: Part - A ( Any 7 Experiments):

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

Part - B ( Any 5 Experiments ):
10. Characterization of LED.
12. Intensity modulation of Laser output through an optical fiber.
14. Measurement of NA.
15. Measurement of losses for Analog Optical link.

Equipment required for Laboratories:

1. Regulated Klystron Power Supply
2. VSWR Meter
3. Micro Ammeter - 0 - 500 µA
4. Multimeter
5. CRO
6. GUNN Power Supply, Pin Moderator
7. Reflex Klystron
8. Crystal Diodes
9. Micro wave components (Attenuation)
10. Frequency Meter
11. Slosted line carriage
12. Probe detector
13. wave guide shorts
14. Pyramidal Horn Antennas
15. Directional Coupler
16. E, H, Magic Tees
17. Circulators, Isolator
18. Matched Loads
19. Fiber Optic Analog Trainer based LED
20. Fiber Optic Analog Trainer based laser
21. Fiber Optic Digital Trainer
22. Fiber cables - (Plastic, Glass)
LIST OF EXPERIMENTS:

1. To study the architecture of DSP chips – TMS 320C 5X/6X Instructions.
2. To verify linear convolution.
3. To verify the circular convolution.
4. To design FIR filter (LP/HP) using windowing technique
   a) Using rectangular window
   b) Using triangular window
   c) Using Kaiser window
5. To Implement IIR filter (LP/HP) on DSP Processors
7. MATLAB program to generate sum of sinusoidal signals.
8. MATLAB program to find frequency response of analog LP/HP filters.
9. To compute power density spectrum of a sequence.
10. To find the FFT of given 1-D signal and plot.
UNIT I
Overview of optical fiber communication - Historical development, The general system, advantages of optical fiber communications. Optical fiber wave guides- Introduction, Ray theory transmission, Total Internal Reflection, Acceptance angle, Numerical Aperture, Skew rays. Cylindrical fibers- Modes, Vnumber, Mode coupling, Step Index fibers, Graded Index fibers.

UNIT II

UNIT III

UNIT IV

UNIT V
Source to fiber power launching - Output patterns, Power coupling, Power launching, Equilibrium Numerical Aperture, Laser diode to fiber coupling.

UNIT VI
Optical detectors- Physical principles of PIN and APD, Detector response time, Temperature effect on Avalanche gain, Comparison of Photodetectors. Optical receiver operation-Fundamental receiver operation, Digital signal transmission, error sources, Receiver configuration, Digital receiver performance, Probability of error, Quantum limit, Analog receivers.

UNIT VII
Optical system design — Considerations, Component choice, Multiplexing. Point-to- point links, System considerations, Link power budget with examples. Overall fiber dispersion in Multi mode and Single mode fibers, Rise time budget with examples.

UNIT VIII
Transmission distance, Line coding in Optical links, WDM, Necessity, Principles, Types of WDM, Measurement of Attenuation and Dispersion, Eye pattern.

TEXT BOOKS :

REFERENCES :
UNIT I
INTRODUCTION : Embedded systems overview, design challenge, processor technology, IC technology, Design Technology, Trade-offs. Single purpose processors RT-level combinational logic, sequential logic (RT- level), custom single purpose processor design (RT-level), optimizing custom single purpose processors.

UNIT II
GENERAL PURPOSE PROCESSORS : Basic architecture, operation, Pipelining, Programmer’s view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

UNIT III
STATE MACHINE AND CONCURRENT PROCESS MODELS : Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

UNIT IV
COMMUNICATION INTERFACE : Need for communication interfaces, RS232 / UART, RS422 / RS485, USB, Infrared, IEEE 1394 Firewire, Ethernet, IEEE 802.11, Blue tooth.

UNIT V
EMBEDDED / RTOS CONCEPTS – I : Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex.

UNIT VI
EMBEDDED/RTOS CONCEPTS – II : Mailboxes , Message Queues, Event Registers, Pipes, Signals

UNIT VII
EMBEDDED / RTOS CONCEPTS – III : Timers, Memory Management, Priority inversion problem, Embedded operating systems Embedded Linux, Real-time operating systems, RT Linux, Handheld operating systems, Windows CE.

UNIT VIII

TEXT BOOKS :

REFERENCES :
UNIT I

UNIT II

UNIT III

UNIT IV
Mechanical function, Electrical Conduction system of the heart. Cardiac cycle. Relation between electrical and mechanical activities of the heart.

UNIT V
Cardiac Instrumentation Blood pressure and Blood flow measurement. Specification of ECG machine. Einthoven triangle, Standard 12-lead configurations, Interpretation of ECG waveform with respect to electro mechanical activity of the heart.

UNIT VI

UNIT VII
Neuro-Muscular Instrumentation Specification of EEG and EMG machines. Electrode placement for EEG and EMG recording. Interpretation of EEG and EMG.

UNIT VIII
Respiratory Instrumentation Mechanism of respiration, Spirometry, Pnuemotachograph Ventilators.

TEXT BOOKS :

REFERENCES :
UNIT I
INTRODUCTION TO VERILOG: Verilog as HDL, Levels of Design Description, Concurrency, Simulation and Synthesis, Functional Verification, System Tasks, Programming Language Interface (PLI), Module, Simulation and Synthesis Tools, Test Benches.
LANGUAGE CONSTRUCTS AND CONVENTIONS: Introduction, Keywords, Identifiers, White Space Characters, Comments, Numbers, Strings, Logic Values, Strengths, Data Types, Scalars and Vectors, Parameters, Memory, Operators, System Tasks, Exercises.

UNIT II
GATE LEVEL MODELING: Introduction, AND Gate Primitive, Module Structure, Other Gate Primitives, Illustrative Examples, Tri-State Gates, Array of Instances of Primitives, Additional Examples, Design of Flip-flops with Gate Primitives, Delays, Strengths and Contention Resolution, Net Types, Design of Basic Circuits, Exercises.

UNIT III
BEHAVIORAL MODELING: Introduction, Operations and Assignments, Functional Bifurcation, Initial Construct, Always Construct, Examples, Assignments with Delays, Wait construct, Multiple Always Blocks, Designs at Behavioral Level, Blocking and Non blocking Assignments, The case statement, Simulation Flow. if and if-else constructs, assign-deassign construct, repeat construct, for loop, the disable construct, while loop, forever loop, parallel blocks, force-release construct, Event.

UNIT IV
MODELING AT DATA FLOW LEVEL: Introduction, Continuous Assignment Structures, Delays and Continuous Assignments, Assignment to Vectors, Operators.
SWITCH LEVEL MODELING.
Introduction, Basic Transistor Switches, CMOS Switch, Bi-directional Gates, Time Delays with Switch Primitives, Instantiations with Strengths and Delays, Strength Contention with Trireg Nets, Exercises.

UNIT V
SYSTEM TASKS, FUNCTIONS, AND COMPILER DIRECTIVES: Introduction, Parameters, Path Delays, Module Parameters, System Tasks and Functions, File-Based Tasks and Functions, Compiler Directives, Hierarchical Access, General Observations, Exercises,
FUNCTIONS, TASKS, AND USER-DEFINED PRIMITIVES: Introduction, Function, Tasks, User-Defined Primitives (UDP), FSM Design (Moore and Mealy Machines)

UNIT VI

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

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

**TEST BOOKS:**
   IEEE Press.

**REFERENCES:**
UNIT I
MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION : Introduction, FDMA, TDMA, Spread Spectrum, Multiple access, SDMA, Packet radio, Packet radio protocols, CSMA protocols, Reservation protocols.

UNIT II

UNIT III
WIRELESS DATA SERVICES : CDPD, ARDIS, RMD, Common channel signaling, ISDN, BISDN and ATM, SS7, SS7 user part, signaling traffic in SS7.

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

UNIT V
WIRELESS LAN TECHNOLOGY : Infrared LANs, Spread spectrum LANs, Narrow bank microwave LANs, IEEE 802 protocol Architecture, IEEE802 architecture and services, 802.11 medium access control, 802.11 physical layer.

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

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

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

TEXT BOOKS :

REFERENCES :
IV Year B.Tech. ECE.II-Sem

DSP PROCESSORS AND ARCHITECTURES (ELECTIVE – IV)

UNIT I
INTRODUCTION TO DIGITAL SIGNAL PROCESSING: Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences. Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and interpolation, Analysis and Design tool for DSP Systems MATLAB, DSP using MATLAB.

UNIT II
COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS: Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

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

UNIT IV
EXECUTION CONTROL AND PIPELINING: Hardware looping, Interrupts, Stacks, Relative Branch support, Pipelining and Performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, Pipeline Programming models.

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

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

UNIT VII
IMPLEMENTATION OF FFT ALGORITHMS: An FFT Algorithm for DFT Computation, A Butterfly Computation, Overflow and scaling, Bit-Reversed index generation, An 8-Point FFT implementation on the TMS320C54XX, Computation of the signal spectrum.

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

TEXT BOOKS:
REFERENCES:
UNIT I
INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS: Introduction, Artificial Neural Networks, Historical Development of Neural Networks, Biological Neural Networks, Comparison Between Brain and the Computer, Comparison Between Artificial and Biological Neural Networks, Network Architecture, Setting the Weights, Activation Functions, Learning Methods.

UNIT II

UNIT III

UNIT IV

UNIT V

UNIT VI

UNIT VII

UNIT VIII

TEXTBOOKS:
2. Introduction to Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, TMH.

REFERENCES:
3. Fundamental of Neural Networks – Laurene Fausett, Pearson, 1st Ed.
4. Artificial Neural Networks - B. Yegnanarayana, PHI.