2007-2008

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

B.TECH ELECTRONICS AND CONTROL ENGINEERING

I YEAR
COURSE STRUCTURE

CODE	SUBJECT		T	P/D	C
	English		2+1*	-	4
	Mathematics-I		3+1*	-	6
	Applied Physics		2+1*	-	4
	Mathematical Methods		3+1*	-	6
	C Programming and Data Structures	3+1*	-	6	
	Network Analysis		2+1*	-	4
	Electronics Devices and Circuits		3+1*	-	6
	Engineering Drawing		-	3	4
	Computer Programming Lab		-	3	4
	Electronics Devices and Circuits Lab	-	3	4	
	IT Workshop		-	3	4
	English Language Communication Skills Lab		-	3	4
	Total		25	15	56

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

B.TECH ELECTRONICS AND CONTROL ENGINEERING

II YEAR – I SEMESTER

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
	Mathematics-III	4+1*	-	4
	Electrical Technology	4+1*	-	4
	Electro Magnetic Fields	4+1*	-	4
	Signals and Systems	4+1*	-	4
	Instrumentation and Control System Components	4+1*	-	4
	Switching Theory and Logic Design	4+1*	-	4
	Electrical Technology Lab	-	3	2
	Electrical Circuits Lab	-	3	2
	Total	30	6	28

II YEAR – II SEMESTER

COURSE STRUCTURE

CODE	SUBJECT		T	P	C
	Managerial Economics and Financial Analysis	4+1*	-	4	
	Environmental Studies		4+1*	-	4
	Electrical and Electronic Measurements		4+1*	-	4
	Control Systems		4+1*	-	4
	Pulse and Digital Circuits		4+1*	-	4
	Transducers		4+1*	-	4
	Pulse and Digital Circuits Lab		-	3	2
	Instrumentation Lab		-	3	2
	Total		30	6	28

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA**

B.TECH ELECTRONICS AND CONTROL ENGINEERING

III YEAR – I SEMESTER

COURSE STRUCTURE

CODE	SUBJECT		T	P	C
	Computer Organization		4+1*	-	4
	Prime Movers and Mechanical Components		4+1*	-	4
	Principles of Communications		4+1*	-	4
	Power Electronics	4+1*	-	4	
	Linear and Digital IC Applications		4+1*	-	4
	Process Control		4+1*	-	4
	IC Applications Lab		-	3	2
	Advanced English Communication Skills Lab		-	3	2
	Total		30	6	28

III YEAR – II SEMESTER

COURSE STRUCTURE

CODE	SUBJECT		T	P	C
	VLSI Design		4+1*	-	4
	Microprocessors and Microcontrollers		4+1*	-	4
	Digital Signal Processing		4+1*	-	4
	Management Science		4+1*	-	4
	Power Plant Instrumentation and Control		4+1*	-	4
	Advanced Control Systems	4+1*	-	4	
	Microprocessors and Microcontrollers Lab		-	3	2
	Control Systems Lab-I		-	3	2
	Total		30	6	28

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

B.TECH ELECTRONICS AND CONTROL ENGINEERING

IV YEAR – I SEMESTER

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
	Neural Networks and Fuzzy Logic	4+1*	-	4
	Object Oriented Programming	4+1*	-	4
	Digital Control Systems	4+1*	-	4
	Adaptive Control Systems	4+1*	-	4
	ELECTIVE – I	4+1*	-	4
	Database Management Systems			
	Robotics and Automation			
	Instrumentation and Control in Manufacturing Systems			
	ELECTIVE – II	4+1*	-	4
	Software Engineering			
	Hydraulic and Pneumatic Control Systems			
	Embedded and Real Time Systems			
	JAVA Lab	-	3	2
	Control Systems Lab-II	-	3	2
	Total	30	6	28

IV YEAR – II SEMESTER

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
	Industrial Electronics	4+1*	-	4
	ELECTIVE – III	4+1*	-	4
	Artificial Intelligence			
	Telemetry and Telecontrol			
	Virtual Instrumentation			
	ELECTIVE – IV	4+1*	-	4
	Management Information Systems			
	PC Based Instrumentation and Control			
	Wireless Communication and Networks			
	Industry Oriented Mini Project	-	-	2
	Seminar	-	-	2
	Project Work	-	-	10
	Comprehensive Viva	-	-	2
	Total	15	-	28

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
KAKINADA

I YEAR B.TECH   E.Cont.E   T   P   C
                                                           2+1*   0   4
ENGLISH

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
1. **LEARNING ENGLISH:** *A Communicative Approach*,KAKINADA: Orient Longman, 2006.   (Six Selected Lessons)
For Non-detailed study
2. **WINGS OF FIRE:** *An Autobiography – APJ Abdul Kalam*, Abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004.
A. STUDY MATERIAL:
Unit –I
1. Astronomy from LEARNING ENGLISH: *A Communicative Approach,* Orient Longman, 2005.

2. Chapters 1-4 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd.,2004**
Unit –II
3. Information Technology **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**
4. Chapters 5-8 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd.,2004**

Unit –III
5. Humour **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**
6. Chapters 9-12 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises., Universities Press (India) Pvt. Ltd.,2004**
Unit –IV
7. Environment **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**
8. Chapters 13-16 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd.,2004**

Unit –V
9. Inspiration **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**

10. Chapters 17-20 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd.,2004.**

Unit – VI

11. Human Interest **from** LEARNING ENGLISH: *A Communicative Approach,* **Orient Longman, 2005.**

12. Chapters 21-24 **from** Wings of Fire**:** An Autobiography **– APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004.**

* 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
2. **Basic Communication Skills for Technology**, Andrea J Rutherfoord, Pearson Education Asia.
3. **Murphy's English Grammar with CD,** Murphy, Cambridge University Press
4. **English Skills for Technical Students** by Orient Longman
5. **Everyday Dialogues in English** by Robert J. Dixson, Prentice-Hall of India Ltd., 2006.
6. **English For Technical Communication**, Vol. 1 & 2, by K. R. Lakshmi Narayanan, Sci tech. 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)
9. **Speaking and Writing for Effective Business Communication,** Francis Soundararaj, MacMillan India Ltd., 2007.
10. **The Oxford Guide to Writing and Speaking,** John Seely, Oxford

I YEAR B.TECH E.Cont.E	T	P	C
	3+1*	0	6

MATHEMATICS – I

UNIT – I
Differential equations of first order and first degree – exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, orthogonal trajectories.

UNIT – II
Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, 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
Vector Calculus: Gradient- Divergence- Curl and their related properties of sums- products- Laplacian and second order operators. Vector Integration - Line integral – work done – Potential function – area- surface and volume integrals Vector integral theorems: Green's theorem-Stoke's and Gauss's Divergence Theorem (With out proof). Verification of Green's - Stoke's and Gauss's Theorems.

UNIT – VIII
Laplace transform of standard functions – Inverse transform – first shifting Theorem, Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Convolution theorem – Periodic function - Differentiation and integration of transforms-Application of Laplace transforms to ordinary differential equations Partial fractions-Heaviside's Partial fraction expansion theorem.

Text Books:
1. A text Book of Engineering Mathematics, Vol-1 T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. A text Book of Engineering Mathematics, C. Sankaraiah, V. G. S. Book Links.
3. A text Book of Engineering Mathematics, Shahnaz Bathul, Right Publishers.
4. A text Book of Engineering Mathematics, P. Nageshwara Rao, Y. Narasimhulu & N. Prabhakar Rao, Deepthi Publications.

References:
1. A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill.
2. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.
3. A text Book of Engineering Mathematics, Thamson Book Collection.

I YEAR B.TECH   E.Cont.E

	T	P	C
	2+1*	0	4

APPLIED PHYSICS

UNIT I

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

CRYSTAL STRUCTURES AND X-RAY DIFFRACTION: Introduction -Space lattice - Basis - Unit cell - Lattice parameter - Bravais lattices – Crystal systems -   Structure and packing fractions of Simple cubic - Body centered cubic – Face centered cubic crystals - Directions and planes in crystals – Miller indices - Separation between successive [h k l] planes - Diffraction of X-rays by crystal planes - Bragg's law - Laue method - Powder method.

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 temparature – 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

LASERS: Introduction - Characteristics of Lasers - Spontaneous and stimulated emission of radiation - Einstein's coefficients - Population inversion - Ruby laser - Helium-Neon Laser – CO_2 laser -Semiconductor Laser – Applications of lasers.

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
SCIENCE & TECHNOLOGY OF NANOMATERIALS: Introduction to Nano materials - Basic principles of Nanoscience & Technology – Fabrication of nano materials – Physical & chemical properties of nanomaterials – Carbon nanotubes – Applications of nanotechnology.

TEXTBOOKS:
1. Applied Physics 2nd edition by Dr. P. Appala Naidu & Dr. M. Chandra Shekar, V.G.S. Book links.
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.
3. Solid State Physics by N.W. Ashcroft & N. David Merwin; Thomson Learning.
4. Materials Science by M.S.Vijaya & G. Rangarajan; Tata McGraw Hill.
5. Solid State Physics by P.K. Palanisamy; Scitech Publications (India) Pvt. Ltd.
6. Nano Materials by A.K. Bandyopadhyay, New Age International Publishers.
7. Applied Physics by P.K.Mittal; I.K. International.
8. Applied Physics by K. Vijay Kumar & T. Sreekanth; S. Chand & Company Ltd.

I YEAR B.TECH   E.Cont.E

T	P	C
3+1*	0	6

MATHEMATICAL METHODS

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 – Diagonolization 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

. Solution of Algebraic and Transcendental Equations: Introduction – The Bisection Method – The 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:
1. Mathematical Methods, T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. Mathematical Methods, C. Sankaraiah, V. G. S. Book Links.
3. A text book of Mathematical Methods, V. Ravindranath, A. Vijayalaxmi, Himalaya Publishers.
4. A text book of Mathematical Methods, Shahnaz Bathul, Right Publisshers.

References:
1. A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill.
2. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.
3. Numerical Methods for Scientific and Engineering Computation, M. K. Jain, S. R. K. Iyengar & R. K. Jain, New Age International Publishers.

4. Elementary Numerical Analysis, Aitkinson & Han, Wiely India, 3rd Edition, 2006

I YEAR B.TECH   E.Cont.E

	T	P	C
	3+1*	0	6

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, bit-wise 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 :
1. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.
2. DataStructures Using C – A.S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson education.

REFERENCES :
1. C& Data structures – P. Padmanabham, B.S. Publications.
2. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education
3. C Programming with problem solving, J.A. Jones & K. Harrow, dreamtech Press
4. Programming in C – Stephen G. Kochan, III Edition, Pearson Eductaion.
5. Data Structures and Program Design in C, R.Kruse, C.L. Tondo, BP Leung, Shashi M, Second Edition, Pearson Education.

I YEAR B.TECH   E.Cont.E

T	P	C
2+1*	0	4

NETWORK ANALYSIS

UNIT – I Introduction to Electrical Circuits
Circuit Concept – R-L-C parameters – Voltage and Current sources – Independent and dependent sources-Source transformation – Voltage – Current relationship for passive elements – Kirchoff's laws – network reduction techniques – series, parallel, series parallel, star-to-delta or delta-to-star transformation.

UNIT – II A.C 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. Milliman's Theorem – Statement and proofs problem solving using dependent and independent sources for d.c and a.c excitation.

UNIT – VI   Two-port networks
Z,Y, ABCD, h-parameters – Conversion of one parameter to another parameter – condition for reciprocity and symmetry – 2 port network connections in series, parallel and cascaded – problem solving.

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
L.P, H.P, B.P, B.E, Prototype filters design – M-derived filters of L.P. and H.P.- Composite filter design of L.P. and H.P design of various symmetrical attenuators.

TEXT BOOKS :
1. Network Analysis – ME Van Valkenburg, Prentice Hall of India, 3rd Edition, 2000.
2. Networks, Lines and Fields - JD Ryder, PHI, 2nd Edition, 1999.

REFERENCES :
1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, McGraw Hill, 5th Edition, 1993.
2. Network Analysis – N.C.Jagan and C.Lakshminarayana, B.S. Publications, 2006.
3. Electric Circuits – J.Edminister and M.Nahvi – Schaum's Outlines, TMH, 1999.
4. Electrical circuits by A.Chakarborthy, Dhanpath Rai & Co.,

I YEAR B.TECH   E.Cont.E

	T	P	C
	3+1*	0	6

ELECTRONIC DEVICES AND CIRCUITS

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, Varactar 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, Π- section filter, Multiple L-section and Multiple Πsection 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 characterisitics (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 V_{BE}, I_{co},) 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 :

1. Electronic Devices and Circuits – J.Millman, C.C.Halkias, and Satyabratha Jit Tata McGraw Hill, 2nd Ed., 2007.
2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall,9th Edition,2006.

REFERENCES :

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

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I YEAR B.TECH   E.Cont.E

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ENGINEERING DRAWING

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
Isomeric 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

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I YEAR B.TECH   E.Cont.E

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COMPUTER PROGRAMMING LAB

Objectives:
- 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 I.
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 Sum:
Sum=$1-x^2/2! +x^4/4!-x^6/6!+x^8/8!-x^{10}/10!$
b) Write a C program toe 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   = $ut+1/2at^2$ 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 larges 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:
$1+x+x^2+x^3+\ldots\ldots+x^n$
For example: if n is 3 and x is 5, then the program computes 1+5+25+125.
Print x, n, the sum
Perform error checking. For example, the formula does not make sense for negative exponents – if n is less than 0. Have your program print an error message if n<0, then go back and read in the next pair of numbers of without computing the sum. Are any values of x also illegal ? If so, test for them too.

Week 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
1. C programming and Data Structures, P. Padmanabham, Third Edition, BS Publications
2. Data Structures: A pseudo code approach with C, second edition R.F. Gilberg and B.A. Forouzan
3. Programming in C, P.Dey & M. Ghosh, Oxford Univ.Press.
4. C and Data Structures, E Balaguruswamy, TMH publications.

I YEAR B.TECH E.Cont.E	T	P	C
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ELECTRONIC DEVICES AND CIRCUITS LAB

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.
3. Soldering practice – Simple Circuits using active and passive components.
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).
   11. Single stage R-C coupled Amplifier.
   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   -   0-20M Hz.
   3.   Function Generators   -   0-1 M Hz.
   4.   Multimeters
   5.   Decade Resitance Boxes/Rheostats
   6.   Decade Capacitance Boxes
   7.   Micro Ammeters (Analog or Digital)   -   0-20 µA, 0-50µA, 0-100µA, 0-200µA
   8.   Voltmeters (Analog or Digital)   -   0-50V, 0-100V, 0-250V
   9.   Electronic Components   - Resistors, Capacitors, BJTs, LCDs, SCRs, UJTs,
        FETs, LEDs,
        MOSFETs,diodes(ge&sitype),transistors(npn & pnp type)

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IT WORKSHOP

Objectives :
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, Hyper linking, 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 - Task1 : 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
2. The Complete Computer upgrade and repair book,3rd edition Cheryl A Schmidt, 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

I YEAR B.TECH E.Cont.E	T	P	C
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ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

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 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.
4. Oral Presentations- Prepared and Extempore.
5. 'Just A Minute' Sessions (JAM).
6. Describing Objects / Situations / People.
7. Information Transfer
8. Debate
9. Telephoning Skills.
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
▪ English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

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.

2. **English Pronouncing Dictionary** Daniel Jones Current Edition with CD.
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)
6. **A Practical Course in English Pronunciation**, (with two Audio cassettes) by J. Sethi, Kamlesh Sadanand & D.V. Jindal, Prentice-Hall of India Pvt. Ltd., New Delhi.
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.

II YEAR B.TECH E.Cont.E I-Sem

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MATHEMATICS – III

UNIT – I
Special functions: Gamma and Beta Functions – Their properties – evaluation of improper integrals. Bessel functions – properties – Recurrence relations – Orthogonality. Legendre polynomials – Properties – Rodrigue's formula – Recurrence relations – Orthogonality.

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

UNIT-III

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

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

UNIT-V
Complex power series: Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series. Singular point –Isolated singular point – pole of order m – essential singularity.

UNIT-VI

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

(a) Improper real integrals $\int_{-\infty}^{\infty} f(x)dx$ (b) $\int_{c}^{c+2\pi} f(\cos\theta, \sin\theta)d\theta$

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

UNIT-VII

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

UNIT-VIII
Conformal mapping: Transformation by e^z, lnz, 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:

1. A text Book of Engineering Mathematics, Vol-III T. K. V. Iyengar, B. Krishna Gandhi and Others, S. Chand & Company.
2. A text Book of Engineering Mathematics, C. Sankaraiah, V. G. S. Book Links.
3. A text Book of Engineering Mathematics, Shahnaz Bathul, Prentice Hall of India.
4. A text Book of Engineering Mathematics, P. Nageshwara Rao, Y. Narasimhulu & N. Prabhakar Rao, Deepthi Publications.

REFERENCES:
1. A text Book of Engineering Mathematics, B. V. Raman, Tata Mc Graw Hill.
2. Advanced Engineering Mathematics, Irvin Kreyszig, Wiley India Pvt. Ltd.
3. A text Book of Engineering Mathematics, Thamson Book Collection.

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II YEAR B.TECH E.Cont.E I-Sem

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ELECTRICAL TECHNOLOGY

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: ALTERNATORS
Alternators – Constructional features – Principle of operation – Types - EMF Equation – Distribution and Coil span factors – Predetermination of regulation by Synchronous Impedance Method – OC and SC tests.

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:
1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.
2. Basic Electrical Engineering by T.K. Nagasarkar and M.S.Sukhija, Oxford University Press, 2005

REFERENCES:
1. Principles of Electrical Engineering by V.K Mehta, S.Chand Publications
2. Theory and Problems of basic electrical engineering by I.J. Nagarath amd D.P Kothari, PHI Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin

II YEAR B.TECH E.Cont.E I-Sem

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ELECTROMAGNETIC FIELDS

Objective :
The objective of this course is to introduce the concepts of electric field and magnetic fields and their applications which will be utilized in the development of the theory for power transmission lines and electrical machines.

UNIT – I Electrostatics :
Electrostatic Fields – Coulomb's Law – Electric Field Intensity (EFI) – EFI due to a line and a surface charge – Work done in moving a point charge in an electrostatic field – Electric Potential – Properties of potential function – Potential gradient – Guass's law – Application of Guass's Law – Maxwell's first law, div (D)=ρv

UNIT – II   Conductors and Dielectric:
Laplace's and Poison's equations – Solution of Laplace's equation in one variable. Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Behavior of conductors in an electric field – Conductors and Insulators.

UNIT – III   Dipole & Capacitance :
Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions, Capacitance – Capacitance of parallel plate and spherical and co-axial capacitors with composite dielectrics – Energy stored and energy density in a static electric field – Current density – conduction and Convection current densities – Ohm's law in point form – Equation of continuity

UNIT – IV   Magneto Statics :
Static magnetic fields – Biot-Savart's law – Oesterd's experiment - Magnetic field intensity (MFI) – MFI due to a straight current carrying filament – MFI due to circular, square and solenoid current – Carrying wire – Relation between magnetic flux, magnetic flux density and MFI – Maxwell's second Equation, div(B)=0.

UNIT – V   Ampere's circuital law and its applications
Ampere's circuital law and its applications viz. MFI due to an infinite sheet of current and a long current carrying filament – Point form of Ampere's circuital law – Maxwell's third equation, Curl (H)=Jc, Field due to a circular loop, rectangular and square loops.

UNIT – VI   Force in Magnetic fields :
Magnetic force - Moving charges in a Magnetic field – Lorentz force equation – force on a current element in a magnetic field – Force on a straight and a long current carrying conductor in a magnetic field – Force between two straight long and parallel current carrying conductors – Magnetic dipole and dipole moment – a differential current loop as a magnetic dipole – Torque on a current loop placed in a magnetic field

UNIT – VII   Magnetic Potential :
Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson's equations.

Self and Mutual inductance – Neumans's formulae – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field. Introduction to permanent magnets, their characteristics and applications.

UNIT – VIII   Time Varying Fields :
Time varying fields – Faraday's laws of electromagnetic induction – Its integral and point forms – Maxwell's fourth equation, Curl (E)=-∂B/∂t – Statically and Dynamically induced EMFs – Simple problems -Modification of Maxwell's equations for time varying fields – Displacement current – Pointing Theorem and Pointing vector.

TEXT BOOKS
1. "Engineering Electromagnetics" by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2006.
2. "Electro magnetic Fields" by Sadiku, Oxford Publications

REFERENCE BOOKS :

1. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd editon
2. "Electromagnetics" by J P Tewari.
3. "Electromagnetics" by J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.
4. "Electromagnetic fields", by S. Kamakshaiah, Right Publishers, 2007.

II YEAR B.TECH E.Cont.E I-Sem

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SIGNALS AND SYSTEMS

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

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

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

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

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

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

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

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

TEXT BOOKS :
   1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
   2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.
REFERENCES :
   1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2nd Edition.
   2. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3rd Edn., 2000.
   3. Fundamentals of Signals and Systems Michel J. Robert, MGH International Edition, 2008.
   4. Signals, Systems and Transforms - C. L. Philips, J.M.Parr and Eve A.Riskin, Pearson education.3rd Edition, 2004.

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II YEAR B.TECH E.Cont.E I-Sem	T	P	C
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INSTRUMENTATION AND CONTROL SYSTEM COMPONENTS

UNIT – I: MECHANICAL COMPONENTS
Pivots & Bearings, Linkages, Gears, Belt Chain & Friction Drives, Dials, Scales, Pointers & Indicating mechanism, Ratchets, Counters, Escapement, Integrators, Rack & Pinion, Geneva Mechanism, Gyroscopes.

UNIT – II: PNEUMATIC COMPONENTS
Flapper nozzle, bellows, boosters, pneumatic relays, flip-flops, safety relief valves and pilot valves, pneumatic cylinders motors, pneumatic operated valves.

UNIT – III: ELECTRICAL AND ELECTROMECHANICAL COMPONENTS-I
Transformers - Pulse transformers, Relays & Switches, Potentiometers, Synchros - Magnetic Amplifiers, Demodulators, Modulators.

UNIT – IV: ELECTROMECHANICAL COMPONENTS - II
AC & DC Servomotors, Stepper motors.

UNIT – V: ELECTRONIC COMPONENTS -I
Different types of resistors, capacitances and inductors - Different types of diodes, Transistors – bipolar, FET and UJT

UNIT – VI: ELECTRONIC COMPONENTS - II
Thyristors - SCR, Diac and Triacs. Selected IC chips - 741, 555, 725, 723, LM317.

UNIT – VII: OPTOELECTRONIC COMPONENTS
Optoelectronic devices - LED, LDR, Photo detector arrays, Opto couplers, PIN Diodes

UNIT – VIII: OPTICAL COMPONENTS
Optical Components - Optical filters, resonators, reflectors, beam splitters, Optical flats, lenses, prisms, gratings.

TEXT BOOKS:
1. Gibson, T.E and Tetuer F.B., Control System Components, McGraw Hill, New York, 1993.
2. Greenwood, Mechanical Details for Product Design, McGraw Hill, New York, 1990.

REFERENCES:
1. C.J.Chermond, Viva Book, 1998, Basic Control Technology.

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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
BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS : Fundamental postulates of Boolean Algebra - Basic theorems and properties - switching functions–Canonical and Standard forms-Algebraic simplification digital logic gates, properties of XOR gates –universal gates-Multilevel NAND/NOR realizations.

UNIT III
MINIMIZATION OF SWITCHING FUNCTIONS : 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, Code-converters, 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
ALGOROTHIMIC 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 :
1. Switching & Finite Automata theory – Zvi Kohavi, TMH,2nd Edition.
2. Digital Design – Morris Mano, PHI, 3rd Edition, 2006.

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

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ELECTRICAL TECHNOLOGY LAB

Any TEN of the following experiments must be conducted:

1. Open circuit characteristics of a separately excited DC generator.
2. Load characteristics of a DC shunt generator.
3. Speed control of a DC shunt motor
   i.   Flux control method.
   ii.   Armature control method.
4. Performance characteristics of a DC shunt motor.
5. Swinburne's test on DC shunt motor.
6. O.C. and S.C. tests on a single phase transformer.
7. Load test on 3 phase squirrel cage Induction motor.
8. Regulation of an alternator using synchronous impedance method.
9. Load test on DC long shunt compound generator.
10. Brake test on DC compound motor.
11. No-load and rotor blocked test on 3 phase Induction motor.
12. V and inverted V curves of synchronous motor.
13. Load characteristics of DC short shunt compound generator.

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ELECTRICAL CIRCUITS LAB

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

1. Series and parallel resonance – timing and 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, Analytical verification.
4. Verification of Superposition and Reciprocity theorems.
5. Verification of Max. Power transfer theorem. DC Circuits and AC Circuits with resistive and reactive loads.
6. Experimental determination of Thevenin's & Norton's equivalent circuits and verification by direct test.
7. Current locus diagram with RL & RC with R – varying in both cases and with C varying.
8. Verification of Compensation and Millman's theorem.

In addition to the above eight experiments, atleast any two of the experiments from the following list are required to be conducted:

9. Separation of Self and Mutual inductance in a Coupled Circuit. Determination of Co-efficient of Coupling.
10. Harmonic Analysis of non-sinusoidal waveform signals using Harmonic Analyzer and plotting frequency spectrum.
11. Determination of form factor for non-sinusoidal waveform, by taking the magnetization current in a transformer, as the applied voltage is varied. Experimental determination by measurement of RMS, average values. Verification from the wave form output.
12. Generation of non-linear periodic waveform for square wave using clipping and clamping. Control of average value of the output waveform.

II YEAR B.TECH E.Cont.E II-Sem

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MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Unit I *Introduction to Managerial Economics:*

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

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

Unit III Theory of Production and Cost Analysis: Production Function – Isoquants and Isocosts, MRTS, Least Cost Combination of Inputs, Cobb-Douglas Production function, Laws of Returns, Internal and External Economies of Scale.
Cost Analysis: Cost concepts, Opportunity cost, Fixed vs. Variable costs, Explicit costs Vs. Implicit costs, Out of pocket costs vs. Imputed costs. Break-even Analysis (BEA)-Determination of Break-Even Point (simple problems)- Managerial Significance and limitations of BEA.

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

Unit V Business & New Economic Environment: Characteristic features of Business, Features and evaluation of Sole Proprietorship, Partnership, Joint Stock Company, Public Enterprises and their types, Changing Business Environment in Post-liberalization scenario.
Unit VI Capital and Capital Budgeting: Capital and its significance, Types of Capital, Estimation of Fixed and Working capital requirements, Methods and sources of raising finance.
 Nature and scope of capital budgeting, features of capital budgeting proposals, Methods of Capital Budgeting: Payback Method, Accounting Rate of Return (ARR) and Net Present Value Method (simple problems)

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

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

TEXT BOOKS:

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

REFERENCES:

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi.
2. H. Craig Peterson & W. Cris Lewis, Managerial Economics, PHI, 4th Ed.
3. Suma Damodaran, Managerial Economics, Oxford University Press.
4. Lipsey & Chrystel, Economics, Oxford University Press.
5. S. A. Siddiqui & A. S. Siddiqui, Managerial Economics & Financial Analysis, New age International Space Publications.

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

Prerequisites: Nil

Objective: To explain the basic principles of managerial economics, accounting and current business environment underlying business decision making.

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

Question Paper Pattern: 5 Questions to be answered out of 8 questions.
Each question should not have more than 3 bits.

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ENVIRONMENTAL STUDIES

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 – Floods, 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 ological 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
Biodiversity and its conservation : Introduction - Definition: genetic, species andecosystem diversity. - Bio-geographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - . Biodiversity at global, National and local levels. - . India as a mega-diversity nation - Hot-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India – Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

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
Social Issues and the Environment : From Unsustainable to Sustainable development -Urban problems related to energy -Water conservation, rain water harvesting, watershed management -Resettlement and rehabilitation of people; its
problems and concerns. Case Studies -Environmental ethics: Issues and possible solutions. -Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. -Wasteland reclamation. –Consumerism and waste products. -Environment Protection Act. -Air (Prevention and Control of Pollution) Act. -Water (Prevention and control of Pollution) Act -Wildlife Protection Act -Forest Conservation Act -Issues involved in enforcement of environmental legislation. -Public awareness.

UNIT - VII
Human Population and the Environment : Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -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 cosystemspond,
river, hill slopes, etc.

TEXT BOOK:
1   Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University 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.

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ELECTRICAL AND ELECTRONIC MEASUREMENTS

UNIT-I AMMETERS & VOLTMETERS
Suspension galvanometer, torque and deflection of galvanometer, permanent magnet moving coil mechanism, DC ammeters, DC voltmeters, Voltmeters, Voltmeter sensitivity.

UNIT II ELETRICAL INSTRUMENTS
Series and shunt type ohmmeters, multimeter, alternating current indicating indicating instruments, thermo instruments

UNIT III POWER & ENERGY METERS
Electro dynamometers in power measurements, watt hour meter, power factor meter, instrument transformers.

UNIT-IV ELECTRONIC INSTRUMENTS - I
FET input volt-ohm-ammeters A.C.milli voltmeters, True RMS voltmeters Digital volt-ohm-ammeter.

UNIT V ELECTRONIC INSTRUMENTS - II
Vector impedance meter, phase angle meters digital & analog R.F. power and voltage measurements , Q meter.

UNIT VI OSCILLOSCOPES
Oscilloscope block diagram, cathode ray tube CRT circuits , vertical deflection system, delay line multi trace , horizontal deflection system , oscilloscopes probe special: storage oscilloscope, sampling oscilloscope, digital storage oscilloscope.

UNIT VII SIGNAL GENERATORS AND ANALYZERS
Sine and square wave audio generators and Radio frequency synthesized signal generators heterodyne wave analyzers , spectrum analyzers , Harmonic distortion analyzers.

UNIT VIII FREQUENCY AND TIME MEASUREMENTS
Basic standards, standard time base generators frequency measurements , time measurements period measurements , measurements errors.

TEXT BOOKS:
1. Electronic Instrumentation & Measurements techniques by W.D. Cooper
2. A Course on Electrical and Electronics Measurements by A.K. Sawhney, Dhanpath Rai Publications.

REFERENCES:
1. Transducers & display systems by B.S. Sonde(TMH)
2. Electronic measurements by Oliver & Cage(ISE).

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CONTROL SYSTEMS

Objective :
In this course it is aimed to introduce to the students the principles and applications of control systems in every day 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

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

UNIT – IV   STABILITY ANALYSIS IN S-DOMAIN

The concept of stability – Routh's stability criterion – qualitative stability and conditional stability – limitations of Routh's stability

Root Locus Technique:

The root locus concept - construction of root loci-effects of adding poles and zeros to G(s)H(s) on the root loci.
UNIT – V   FREQUENCY RESPONSE ANALYSIS

Introduction, Frequency domain specifications-Bode diagrams-Determination of Frequency domain specifications and transfer function from the Bode Diagram-Phase margin and Gain margin-Stability Analysis from Bode Plots.
UNIT – VI   STABILITY ANALYSIS IN FREQUENCY DOMAIN

Polar Plots-Nyquist Plots-Stability Analysis.

UNIT – VII   CLASSICAL CONTROL DESIGN TECHNIQUES

Compensation techniques – Lag, Lead, Lead-Lag Controllers design in frequency Domain, PID Controllers.

UNIT – VIII   State Space Analysis of Continuous Systems
Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and 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.,
2. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International
    (P) Limited, Publishers, 2nd edition.

REFERENCE BOOKS:

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

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II YEAR B.TECH E.Cont.E II-Sem

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PULSE AND DIGITAL CIRCUITS

UNIT I
LINEAR WAVESHAPING : 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 clampers.

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
MULTIVIBRATORS : Analysis and Design of Bistable, Monostable, Astable Multivibrators and Schmitt trigger using transistors.

UNIT V
TIME BASE GENERATORS : General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, 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 :
    1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
    2. Solid State Pulse circuits - David A. Bell, PHI, 4th Edn., 2002 .
REFERENCES :
    1. Pulse and Digital Circuits – A. Anand Kumar, PHI, 2005.
    2. Wave Generation and Shaping - L. Strauss.
    3. Pulse, Digital Circuits and Computer Fundamentals - R.Venkataraman.

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TRANSDUCERS

UNIT I: BASIC PERFORMANCE OF TRANSDUCERS
Block diagram of instrumentation system, classification of transducers Performance characteristics of instruments : Static Characteristics –static calibration. Accuracy, precision, error in overall system. Static sensitivity, linearity, threshold, resolution, Hysteresis, dead space, span and range.

UNIT II: DYNAMIC CHARACTERISTICS
Dynamic characteristics- generalized mathematical model of measurements systems, operational and sinusoidal transfer function , sero,First and second order instruments and their response to step, rampAnd impulse inputs. Loading effects under dynamic conditions.

UNIT III: RESISTIVE TRANSDUCERS
Potentiometers, strain gauges and their types resistance thermometers-RTDS, the mistors, Hot wire anemometers.

UNIT IV: INDUCTIVE TRANSDUCERS
Transformer types, electromagnetic types, Magnetostrictive variable remannacne & variable permeability.

UNIT V: CAPACITIVE TRANSDUCERS
Variable dielectric , variable gap, variable area types.

UNIT VI:PIEZO ELECTRIC TRANSDUCERS
Piezo electric effects, piezo resistive effects, peizo electric materials.

UNIT VII: FORCE BALANCE & FORCE SUMMING
The force balance principle, electrodynamics acceleration transducer, electrostatic pressure transducer etc.

UNIT VIII: THERMAL & RADIATION TRASDUCERS
Thermal expansion transducers-thermometers, bimetallic strips.Thermoelectric sensors thermocouples- laws and their reference junction considerations, optical pyrometers two, colour radiation pyrometers. Photo sensors (Photodiode phototransistor infrared LEDs)

TEXT BOOKS:
1. Herman K.P. Neubert "Instrument Tranducers- An introduction to their performance and design " Oxford University press.
2. E.O Doeblin " Measurments system: Applications and Design " M.C.Graw Hill Publication.

REFERENCES
1. B.C.Nakra & K.K. Chowadary " Instrumentation Measurement Technology" Jhon wiley & Sons publishers.
2. Curits D.Jhonson "Process control Instrumentation Technology" Jhon wiley & Sons publishers.

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II YEAR B.TECH E.Cont.E II-Sem

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PULSE AND DIGITAL CIRCUITS LAB

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.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.

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II YEAR B.TECH E.Cont.E II-Sem

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INSTRUMENTATION LAB

(Minimum 10 experiments should be conducted)

1. DC meters using D' Arsonvol Galvanometers
2. AC meters using D' Arsonvol Galvanometers
3. ohm meter
4. RLC & Q measurement using Q-meter
5. Study of CRO-Voltage, frequency and phase measurement
6. Strainguages
7. Resistance Thermometer devices
8. LVDT
9. Capacitive transducers
10. Piezo-Electric Transducers
11. Bordon tube
12. Acceleration transducer

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III YEAR B.TECH E.Cont.E I-Sem

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COMPUTER ORGANIZATION

UNIT I :
BASIC STRUCTURE OF COMPUTERS : Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. Data Representation. Fixed Point Representation. Floating – Point Representation. Error Detection codes.

UNIT II :
REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS : Register Transfer language.Register Transfer Bus and memory transfers, Arithmetic Mircrooperatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.
Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer.

UNIT III :
MICRO PROGRAMMED CONTROL : Control memory, Address sequencing, microprogram example, design of control unit Hard wired control. Microprogrammed control

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

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

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; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

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

UNIT VIII :
MULTI PROCESSORS : Characteristics or Multiprocessors, Interconnection Structures, Interprocessor Arbitration. InterProcessor Communication and Synchronization Cache Coherance. Shared Memory Multiprocessors.

TEXT BOOKS :
1. Computer Organization – Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill.
2. Computer Systems Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI

REFERENCES :
1. Computer Organization and Architecture – William Stallings Sixth Edition, Pearson/PHI
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3. Fundamentals or Computer Organization and Design, - Sivaraama Dandamudi Springer Int. Edition.
4. Computer Architecture a quantitative approach, John L. Hennessy and David A. Patterson, Fourth Edition Elsevier
5.Computer Architecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS Publication.

III YEAR B.TECH E.Cont.E I-Sem

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PRIME MOVERS AND MECHANICAL COMPONENTS

UNIT – I: HYDRAULIC TURBINES

Impact of Jets, Classification – Pelton wheel – Francis and Kaplan turbines – working principle – Specific speed – Performance and Characteristic curves of turbines.

UNIT – II: HYDRAULIC PUMPS

Reciprocating pumps – Types – main components – working principle – air vessels – slip – indicator diagrams – centrifugal pumps – main components – working principle – performance and characteristic curves of centrifugal pump.

UNIT – III: STEAM GENERATORS:

Introduction – classification of boilers – comparison between "Fire – Tube and watertube boilers – selection of boiler – Essentials of a good steam boiler – fire tube boilers – simple vertical boiler, Cochran boiler, Cornish boiler, Lancashire-boiler, locomotive boiler, scotch boiler – water tube boilers – Babcock and Wilcox water – tube boiler – high pressure boilers – Lamon boiler, Loefflar boiler, Benson boiler, Velox Boiler – Super Critical boilers – Super – Charged boilers.

UNIT – IV: BOILER MOUNTINGS AND ACCESSORIES

Introduction – Boiler Mountings – Water level indicator, pressure gauge, safety valves, high steam and low water safety valve, fusible plug, blow – off cock, feed check valve, Junction or stop valve – Boiler accessories – Feed pumps, Injector, Economizer, Air Preheater, Super heater, Steam separator, Steam trap, Steam Condensers.

UNIT-V: STEAM TURBINES

Carnot, Rankine and Joule cycles. Classification – Impulse and Reaction Turbines – Mechanical Details – Principle of Operation – Simple Impulse Turbine – Methods to reduce rotor speed, velocity compounding, pressure compounding and pressure – velocity compounding.

UNIT – VI: GAS TURBINES

Introduction – Classification – gas turbine – simple gas turbine plant – principle of working – ideal and actual cycles – open closed turbines.

UNIT-VII: HYDRAULIC ACTUATING SYSTEMS

Hydraulics- Hydraulic Systems, Hydraulic pump dutychek Control valves, Hydraulic Cylinders, Rotary Actuators.

UNIT – VIII: MECHANICAL ACTUATING SYSTEMS

Mechanical Actuating Systems – Types of Motion, Freedom and Constraints, Loading and Kinematics chains, Slider Change Mechanism

TEXT BOOKS:

1. Hydraulics and fluid mechanics including hydraulic machines - Bansal
2. Thermal engineering - R.S.Kurmy

REFERENCES:
1. Hydraulics and fluid mechanics including hydraulic machines by R.P.N.Modi & dr.
   S.M.Seth
2. Thermal engineering by 1.R.K.Rajput, 2. D.S.Kumar
3. Mechanical details for production design: Greenwood

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III YEAR B.TECH E.Cont.E I-Sem	T	P	C
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PRINCIPLES OF COMMUNICATIONS

UNIT I
Introduction : Block diagram of Electrical communication system, Radio communication : Types of communications, Analog, pulse and digital Types of signals, Fourier Transform for various signals, Fourier Spectrum, Power spectral density, Autocorrelation, correlation, convolution.

UNIT II
Amplitude Modulation : Need for modulation, Types of Amplitude modulation, AM, DSB SC, SSB SC, Power and BW requirements, generation of AM, DSB SC, SSB SC, Demodulation of AM : Diode detector, Product demodulation for DSB SC & SSB SC.

UNIT III
Angle Modulation : Frequency & Phase modulations, advantages of FM over AM, Bandwidth consideration, Narrow band and Wide band FM, Comparison of FM & PM.

UNIT IV
Pulse Modulations : Sampling, Nyquist rate of sampling, Sampling theorem for Band limited signals, PAM, regeneration of base band signal, PWM and PPM, Time Divison Multiplexing, Frequency Divison Multiplexing, Asynchronous Multiplexing.

UNIT V
Digital Communication : Advantages, Block diagram of PCM, Quantization, effect of quantization, quantization error, Base band digital signal, DM, ADM, ADPCM and comparison.

UNIT VI
Digital Modulation : ASK, FSK, PSK, DPSK, QPSK demodulation, coherent and incoherent reception, Modems.

UNIT VII
Information Theory : Concept of information, rate of information and entropy, Source coding for optimum rate of information, Coding efficiency, Shanon-Fano and Huffman coding.

UNIT VIII
Error control coding : Introduction, Error detection and correction codes, block codes, convolution codes.

TEXTBOOKS
1. Communication Systems Analog and Digital – R.P. Singh and SD Sapre, TMH, 20th reprint, 2004.
2. Principles of Communications – H. Taub and D. Schilling, TMH, 2003.

REFERENCES
1. Electronic Communication Systems – Kennedy and Davis, TMH, 4th edition, 2004.
2. Communication Systems Engineering – John. G. Proakis and Masoud Salehi, PHI, 2nd Ed. 2004.

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POWER ELECTRONICS

Objective :
With the advent of semiconductor devices, revolution is taking place in the power transmission distribution and utilization. This course introduces the basic concepts of power semiconductor devices, converters and choppers and their analysis.

UNIT – I   POWER SEMI CONDUCTOR DEVICES
Thyristors – Silicon Controlled Rectifiers (SCR's) – BJT – Power MOSFET – Power IGBT and their characteristics and other thyristors – Basic theory of operation of SCR – Static characteristics – Turn on and turn off methods- Dynamic characteristics of SCR - Turn on and Turn off times -Salient points

UNIT – II   DEVICES AND COMMUTATION CIRCUITS
 Two transistor analogy – SCR - UJT firing circuit ––– Series and parallel connections of SCR's – Snubber circuit details – Specifications and Ratings of SCR's, BJT, IGBT - Numerical problems – Line Commutation and Forced Commutation circuits.

UNIT – III   SINGLE PHASE HALF CONTROLLED CONVERTERS
Phase control technique – Single phase Line commutated converters – Mid point and Bridge connections – Half controlled converters with Resistive, RL loads and RLE load– Derivation of average load voltage and current -Active and Reactive power inputs to the converters without and with Free wheeling Diode –Numerical problems

UNIT – IV   SINGLE PHASE FULLY CONTROLLED CONVERTERS
Fully controlled converters, Mid point and Bridge connections with Resistive, RL loads and RLE load– Derivation of average load voltage and current – Line commutated inverters -Active and Reactive power inputs to the converters without and with Free wheeling Diode, Effect of source inductance – Derivation of load voltage and current – Numerical problems.

UNIT – V   THREE PHASE LINE COMMUTATED CONVERTERS

Three phase converters – Three pulse and six pulse converters – Mid point and bridge connections average load voltage With R and RL loads – Effect of Source inductance–Dual converters (both single phase and three phase) - Waveforms –Numerical Problems.

UNIT – VI   AC VOLTAGE CONTROLLERS & CYCLO CONVERTERS
AC voltage controllers – Single phase two SCR's in anti parallel – With R and RL loads – modes of operation of Triac – Triac with R and RL loads – Derivation of RMS load voltage, current and power factor wave forms – Firing circuits -Numerical problems -Cyclo converters – Single phase mid point cyclo converters with Resistive and inductive load (Principle of operation only) – Bridge configuration of single phase cyclo converter (Principle of operation only) – Waveforms

UNIT – VII   CHOPPERS
Choppers – Time ratio control and Current limit control strategies – Step down choppers Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression
Morgan's chopper – Jones chopper and Oscillation chopper (Principle of operation only) Waveforms –– AC Chopper – Problems.

UNIT – VIII   INVERTERS
Inverters – Single phase inverter – Basic series inverter – Basic parallel Capacitor inverter bridge inverter – Waveforms – Simple forced commutation circuits for bridge inverters – Mc Murray and Mc Murray – Bedford inverters - Voltage control techniques for inverters Pulse width modulation techniques – Numerical problems.

TEXT BOOKS :

1. Power Electronics – by M. D. Singh & K. B. Kanchandhani, Tata Mc Graw – Hill Publishing company, 1998.
2. Power Electronics : Circuits, Devices and Applications – by M. H. Rashid, Prenties Hall of India 2nd edition, 1998

REFERENCE BOOKS :

1. Power Electronics – by Vedam Subramanyam, New Age International (P) Limited, Publishers
2. Power Electronics - by V.R.Murthy , 1st edition -2005, OXFORD University Press
3. Power Electronics-by P.C.Sen,Tata Mc Graw-Hill Publishing.
   Thyristorised Power Controllers – by G. K. Dubey, S. R. Doradra, A. Joshi   and R. M. K. Sinha, New Age International (P) Limited Publishers, 1996.

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LINEAR AND DIGITAL IC APPLICATIONS

UNIT I
INTEGRATED CIRCUITS

Classification, chip size and circuit complexity, basic information of Op-amp, ideal and practical Op-amp, internal circuits, Op-amp characteristics, DC and AC characteristics, 741 op-amp and its features, modes of operation-inverting, non-inverting, differential.

UNIT II
OP-AMP APPLICATIONS

Basic application of Op-amp, instrumentation amplifier, ac amplifier, V to I and I to V converters, sample & hold circuits, multipliers and dividers, Differentiators and Integrators, Comparators, Schmitt trigger, Multivibrators, introduction to voltage regulators, features of 723.

UNIT III
ACTIVE FILTERS & OSCILLATORS

Introduction, 1st order LPF, HPF filters. Band pass, Band reject and all pass filters. Oscillator types and principle of operation – RC, Wien and quadrature type, waveform generators – triangular, sawtooth, square wave and VCO.

UNIT IV
TIMERS & PHASE LOCKED LOOPS

Introduction to 555 timer, functional diagram, monostable and astable operations and applications, Schmitt Trigger. PLL - introduction, block schematic, principles and description of individual blocks of 565.

UNIT V
D-A AND A- 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.

UNIT VI

Classification of Integrated circuits, comparison of various logic families, standard TTL NAND Gate- Analysis& characteristics, TTL open collector O/Ps, Tristate TTL, MOS & CMOS open drain and tristate outputs, CMOS transmission gate, IC interfacing- TTL driving CMOS & CMOS driving TTL .

UNIT VII

 Design using TTL-74XX & CMOS 40XX series, code converters, decoders, Demultiplexers, decoders & drives for LED & LCD display. Encoder, priority　　　　　　　　Encoder, multiplexers & their applications, priority generators/checker circuits.　　　　Digital arithmetic circuits-parallel binary adder/subtractor circuits using 2's, Complement system. Digital comparator circuits.

UNIT VIII
SEQUENTIAL CIRCUITS

 Flip-flops & their conversions. Design of synchronous counters. Decade counter, shift registers & applications, familiarities with commonly available 74XX & CMOS 40XX series of IC counters.
Memories: ROM architecture, types & applications, RAM architecture, Static & Dynamic RAMs, synchronous DRAMs.

TEXT BOOKS

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

REFERENCES:
1. Operational Amplifiers and Linear Integrated Circuits – R.F. Coughlin and Fredrick F. Driscoll, PHI, 1977.
2. Operational Amplifiers and Linear Integrated Circuits: Theory and Applications –Denton J. Daibey, TMH.
3. Design with Operational Amplifiers and Analog Integrated Circuits - Sergio Franco, McGraw Hill, 3rd Ed., 2002.

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PROCESS CONTROL

UNIT – I: INTRODUCTION TO PROCESS CONTROL
Definition-Elements of process control-Process variables-degree of freedom-
Characteristics of liquid system, gas system and thermal system- Mathematical
model of liquid process , gas process, thermal process- Batch process and
continuous process- Self regulation.

UNIT II BASIC CONTROL ACTIONS
Characteristics of ON-OFF, proportional , integral, derivative control modescomposite
control modes – PC, PI and PID modes- two position control- Single
speed floating control – Ziegler Nichols method.

UNIT III: MEASURING ELEMENTS
Types of measuring means –Temperature elements-liquid level measurements –
fluid flow measurements –pneumatic transmission- electric transmission –first
order and second order response to measuring elements.

UNIT IV : CONTROLLING ELEMENTS
Self operated controllers –pneumatic proportional controllers (displacement and
force type)- Air supply for pneumatic systems- Hydraulic controllers –Electrical
proportional controllers-Electronic proportional controllers- Theory of automatic
controllers circuits.

UNIT V : ADVANCED CONTROL TECHNIQUES
Ratio control systems – Dynamic compensatory- adding feedback-principle areas
of feed forward control - Economic considerations.
Properties of inner loop , External feedback –Tuning cascade controllers , Final
Control Elements - Pneumatic actuators –Electro-pneumatic actuators –Hydraulic
actuators –Electric motor actuators –Two position motor actuators –Sliding steam
control valves- Rotating shaft control valves-control valve sizing.

APPLICATIONS OF PROCESS CONTROL:

UNIT VI : ENERGY TRANSFER
Heat transfer-heat exchangers without phase change-Boiling liquids and condensing
vapors-combustion control of fuel and air –fired heaters –steam plant control systems
–drum level control-drum pressure control- steam temperature control.

UNIT VII CHEMICAL REACTIONS AND CONVERSIONS
Principles of governing the conduct of reactions-chemical equilibrium-reaction rate-
Stability of exothermic reactors – continuous reactors-apporting reactant flowstemperature
control-maximizing procedure- controlling conversion.

UNIT VIII : MASS TRANSFER OPERATIONS
Modeling the process- relative gain analysis-configuring the controls composition –
Feedback pressure control methods – controlling at constraints – side steam columns
material –balance control –vapor compression – Evaporation barometric condensers
– rate of drying inferential controls-optimum air flow - Nuclear power plant &
Operations.

TEXT BOOKS:
1. Automatic Process Control- Donal.P.Eckman(Willeyn Eastern)
2. Process Control- Peter Harriot for units (T.M.H)

REFERENCES:
1. Process Control Systems –F.G Shirskey (Mc Graw Hill)
2. Instrument Engineering Hand Book- Liptak & Venezel(Chilton Randor)
3. Process system analysis and control by D.R Coughanowr, 2nd edition McGraw
Hill.
4. Chemical Process control by G.Stephaonopolom, PHI Publications (1998)

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IC APPLICATIONS LAB

1. 741 OPAMP Characteristics
2. Adder, Integrator and differentiator using 741 OPAMP
3. Function Generator using 741 OP AMP
4. IC 555 Timer –Astable Operation
5. IC 555 Timer – Monostable Operation
6. Study of Logic Gates
7. Study of Flip-Flops using ICs
8. Half Adder, Full Adder and Subtractor
9. Counters and Shift Registers & 7490 Counter
10. BCD to 7 Segment decoder using IC 7447
11. Voltage Regulator using IC 723
12. D/A Converter
13. A/D Converter
14. Multiplexer and Demultiplexer

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ADVANCED ENGLISH COMMUNICATION SKILLS LAB

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:

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

2. Objectives:

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

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

3. Syllabus:

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

- Functional English - starting a conversation – responding appropriately and relevantly – using the right body language – role play in different situations.
- Vocabulary building – synonyms and antonyms, word roots, one-word substitutes,   prefixes and suffixes, study of word origin, analogy, idioms and phrases.
- Group Discussion – dynamics of group discussion , intervention, summarizing, modulation of voice, body language, relevance, fluency and coherence.
- Interview Skills – concept and process, pre-interview planning, opening strategies, answering strategies, interview through tele and video-conferencing.
- Resume' writing – structure and presentation, planning, defining the career objective, projecting ones strengths and skill-sets, summary, formats and styles, letter-writing.
- Reading comprehension – reading for facts, guessing meanings from context, scanning, skimming, inferring meaning, critical reading.
- Technical Report writing – Types of formats and styles, subject matter – organization, clarity, coherence and style, planning, data-collection, tools, analysis.

4. Minimum Requirement:

  The English Language Lab shall have two parts:

  i)   **The Computer aided Language Lab** for 60 students with 60 systems, one master console, LAN facility and English language software for self- study by learners.

  ii)   **The Communication Skills Lab** with movable chairs and audio-visual aids with a P.A System, a T. V., a digital stereo –audio & video system and camcorder etc.

  System Requirement (Hardware component):

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

  iii)   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, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
- **The following software from 'train2success.com'**
   - **Preparing for being Interviewed,**
   - **Positive Thinking,**
   - **Interviewing Skills,**
   - **Telephone Skills,**
   - **Time Management**
   - **Team Building,**
   - **Decision making**

- **English in Mind**, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge

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

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

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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
VLSI CIRCUIT DESIGN PROCESSES : VLSI Design Flow, MOS Layers, Stick Diagrams, Design Rules and Layout, 2   m CMOS Design rules for wires, Contacts and Transistors Layout Diagrams for NMOS and CMOS Inverters and Gates, Scaling of MOS circuits, Limitations of Scaling.

UNIT IV
GATE LEVEL DESIGN : Logic Gates and Other complex gates, Switch logic, Alternate gate circuits, Basic circuit concepts, Sheet Resistance RS and its concept to MOS, Area Capacitance Units, Calculations -   - 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
VHDL SYNTHESIS : VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools, Test Principles.

UNIT VIII
CMOS TESTING : CMOS Testing, Need for testing, Test Principles, Design Strategies for test, Chiplevel Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXTBOOKS :
1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Dougles and A. Pucknell, PHI, 2005 Edition.
2. Principles of CMOS VLSI Design - Weste and Eshraghian, Pearson Education, 1999.

REFERENCES :
   1. Chip Design for Submicron VLSI: CMOS Layout & Simulation, - John P. Uyemura, Thomson Learning.
   2. Introduction to VLSI Circuits and Systems - John .P. Uyemura, JohnWiley, 2003.
   3. Digital Integrated Circuits - John M. Rabaey, PHI, EEE, 1997.
   4. Modern VLSI Design - Wayne Wolf, Pearson Education, 3rd Edition, 1997.
     5. VLSI Technology – S.M. SZE, 2nd Edition, TMH, 2003.

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MICROPROCESSORS AND MICROCONTROLLERS

Objective :
The objective of the Microprocessor and Microcontrollers is to do the students familiarize the architecture of 8086 processor, assembling language programming and interfacing with various modules. The student can also understand of 8051 Microcontroller concepts, architecture, programming and application of Microcontrollers. Student able to do any type of industrial and real time applications by knowing the concepts of Microprocessor and Microcontrollers.

UNIT-I   8086 ARCHITECTURE:
Functional Diagram, Register Organization, Addressing modes, Instructions, Functional schematic, Minimum and Maximum mode operations of 8086, 8086 Control signal interfacing, Timing Diagrams.

UNIT-II   ASSEMBLY LANGUAGE PROGRAMMMING OF 8086

Assembly Directives, Macro's, Simple Programs using Assembler, Implimentation of FOR Loop, WHILE, REPEAT and IF-THEN-ELSE Features.

UNIT-III I/O INTERFACE
8255 PPI, Various modes of operations and interface of I/O devices to 8086, A/D, D/A Converter Interfacing.

UNIT-IV INTERFACING WITH ADVANCED DEVICES.

8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control).

UNIT-V   COMMUNICATION INTERFACE
Serial Communication Standards, USART Interfacing RS-232, IEEE-488, 20mA Current Loop, Prototyping and Trouble shooting, Software Debugging tolls, MDS.

UNIT-VI INTRODUCTION TO MICRO CONTROLLERS
Overview of 8051 Micro Controller, Architecture, I/O ports and Memory Organization, Addressing modes and Instruction set of 8051, Simple Programs using Stack Pointer, Assembly language programming.

UNIT-VII 8051 INTERRUPTS COMMUNICATION
Interrupts, Timer/Counter and Serial Communication, Programming Timer Interrupts, Programming External H/W interrupts, Programming the serial communication interrupts, Interrupt Priority in the 8051, Programming 8051 Timers, Counters and Programming.

UNIT- VIII   INTERFACING AND INDUSTRIAL APPLICATIONS
Applications of Micro Controllers, Interfacing 8051 to LED's, Push button, Relay's and Latch Connections, Keyboard Interfacing, Interfacing Seven Segment Display, ADC and DAC Interfacing.

TEXT BOOKS:

1. Kenneth J Ayala, " The 8051 Micro Controller Architecture, Programming and Applications", Thomson Publishers, 2nd Edition.
2. D.V.Hall, "Micro Processor and Interfacing ", Tata McGraw-Hill.

REFERENCE BOOKS:

1. Ajay V. Deshmukh, "Microcontrollers – theory applications", Tata McGraw-Hill Companies – 2005.
2. Ray and BulChandi, " Advanced Micro Processors", Tata McGraw-Hill.
3. Kenneth J Ayala, " The 8086 Micro Processors Architecture, Programming and Applications", Thomson Publishers, 2005.
4. Microcomputer Systems: The 8086/8088 Family: Architecture, Programming and Design, 2nd ed., Liu & Gibson

III YEAR B.TECH E.Cont.E II-Sem

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DIGITAL SIGNAL PROCESSING

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

DISCRETE FOURIER SERIES: Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete Fourier transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT. Relation between Z-transform and DFS

UNIT III

FAST FOURIER TRANSFORMS: Fast Fourier transforms (FFT) - 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 Registger 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:
1. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G. Manolakis,
    Pearson Education / PHI, 2007.
2. Discrete Time Signal Processing – A.V.Oppenheim and R.W. Schaffer, PHI
3. Digital Signal Processors – Architecture, Programming and Applications,, B.Venkataramani, M. Bhaskar, TATA McGraw Hill, 2002

Reference Books:
1. Digital Signal Processing: Andreas Antoniou, TATA McGraw Hill , 2006
2. Digital Signal Processing: MH Hayes, Schaum's Outlines, TATA Mc-Graw Hill, 2007.
3. DSP Primer - C. Britton Rorabaugh, Tata McGraw Hill, 2005.
4. Fundamentals of Digital Signal Processing using Matlab – Robert J. Schilling, Sandra L. Harris, Thomson, 2007.
5. Digital Signal Processing – Alan V. Oppenheim, Ronald W. Schafer, PHI Ed., 2006

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MANAGEMENT SCIENCE

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

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

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

Unit IV: *A) Materials Management***:** Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records - Supply Chain Management
   B) Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies   based on Product Life Cycle., Channels of distribution.

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

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

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

Unit VIII: *Contemporary Management Practices***:** Basic concepts of Just-In-Time (JIT) System, Total Quality Management (TQM), Six sigma and Capability Maturity Model (CMM) Levels, Value Chain Analysis,Enterprise Resource Planning (ERP), Performance Management, Business Process outsourcing (BPO), Business Process Re-engineering and Bench Marking, Balanced Score Card.

Text Book:

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

Reference Books:

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

6. Schermerhorn: *Management*, Wiley, 2007.
7. Parnell: Strategic Management, Biztantra,20073.
8. L.S.Srinath: PERT/CPM,Affiliated East-West Press, 2007.

Pre-requisites: Managerial Economics

*Objective***:** To familiarize with the process of management and to provide basic insights into select contemporary management practices.

Codes/Tables: Normal Distribution Function Table need to be permitted into the examination Hall.

Question Paper Pattern: 5 Questions to be answered out of 8 questions.
Each question should not have more than 3 bits.
Unit VIII will have only short questions, not essay questions.

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POWER PLANT INSTRUMENTATION AND CONTROL

UNIT – I: AN OVERVIEW OF POWER GENERATION

Brief survey of methods of power generation – Hydrothermal, Nuclear, Solar, Wind etc. Importance of instrumentation for power generation – Thermal power plants – Building blocks – Details of the Boiler Processes – PI diagram of Boiler – Cogeneration.

UNIT – II: PARAMETERS AND MEASUREMENTS -I

Electrical measurements – current, Voltage, Power, Frequency power factor, Trivector meter –

UNIT – III: PARAMETERS AND MEASUREMENTS - II

Non electrical parameters, flow of feed water, fuel, air and steam with correction factors for temperature – Pressure – temperature – level radiation detectors – smoke density measurements – dust monitor.

UNIT – IV: COMBUSTION CONTROL IN BOILERS

Combustion control – control of Main header Pressure, air fuel ratio control – furnace draft and excessive air control, drum level (three element control) main and reheat steam temperature control, burner tilting up, bypass damper, super heater

UNIT – V: OTHER CONTROLS

Spray and gas recirculation controls – BFP recirculation control – Hot well and deaerator level control – pulverizer control, Computers in Power Plants.

UNIT – VI: TURBINE MONITORING AND CONTROL

Condenser vacuum control – gland steam exhaust pressure control – Speed, vibration, Shell temperature monitoring and control – Lubricating oil temperature control – Hydrogen – generator cooling system.

UNIT – VII: ANALYZERS IN POWER PLANTS - I

Thermal conductive type – paramagnetic type, Oxygen analyzer, infrared type and trim analyzer – Spectrum analyzer – hydrogen purity meter

UNIT – VIII: ANALYZERS IN POWER PLANTS - II

Chromatography – pH meter – Conductivity cell – fuel analyzer, brief survey of pollution monitoring and control equipment.
TEXT BOOKS:

1. Modern Power Stations Practice, vol. 6, Instrumentation, Controls and Testing
- Pergamon Press, Oxford, 1971.
2. Sam.G.Dukelow, The control of Boilers, Instrument society of America, 1991.

REFERENCES:

1. Power Plant Technology – by Wakil M.M., McGraw Hill.
2. Standard Boiler Operations - Questions and Answers – by Elonka S.M., and Kohal A.L., TMH, New Delhi, 1994.
3. R.K.Jain, Mechanical Instruments, Khanna Publishers, New Delhi, 1995.

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ADVANCED CONTROL SYSTEMS

Objective :
This subject deals with state space, describing function, phase plane and stability analysis including controllability and observability. It also deals with modern control and optimal control systems.

UNIT – I STATE SPACE ANALYSIS

State Space Representation, Solution of State Equation, State Transition Matrix, Canonical Forms – Controllable Canonical Form, Observable Canonical Form, Jordan Canonical Form.

UNIT – II   CONTROLLABILITY AND OBSERVABILITY

Tests for controllability and observability for continuous time systems – Time varying case, minimum energy control, time invariant case, Principle of Duality, Controllability and observability form Jordan canonical form and other canonical forms.

UNIT – III   DESCRIBING FUNCTION ANALYSIS

Introduction to nonlinear systems, Types of nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-IV PHASE-PLANE ANALYSIS

Introduction to phase-plane analysis, Method of Isoclines for Constructing Trajectories, singular points, phase-plane analysis of nonlinear control systems.

UNIT-V   STABILITY ANALYSIS

 Stability in the sense of Lyapunov., Lyapunov's stability and Lypanov's instability theorems. Direct method of Lypanov for the Linear and Nonlinear continuous time autonomous systems.

UNIT – VI   MODAL CONTROL

Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.
UNIT-VII CALCULUS OF VARIATIONS

Minimization of functionals of single function, Constrained minimization. Minimum principle. Control variable inequality constraints. Control and state variable inequality constraints. Euler Lagrangine Equation.

UNIT –VIII   OPTIMAL CONTROL

Formulation of optimal control problem. Minimum time, Minimum energy, minimum fuel problems. State regulator problem. Output regulator problem. Tracking problem, Continuous-Time Linear Regulators.

TEXT BOOKS:

1.   Modern Control System Theory – by M. Gopal, New Age International Publishers, 2nd edition, 1996

 REFERENCE BOOKS:

1.   Modern Control Engineering – by K. Ogata, Prentice Hall of India, 3rd edition, 1998
2.   Control Systems Engineering by I.J. Nagarath and M.Gopal, New Age International (P) Ltd.
3.   Digital Control and State Variable Methods – by M. Gopal, Tata Mc Graw-Hill Companies, 1997.
4.   Systems and Control by Stainslaw H. Zak , Oxford Press, 2003.

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MICROPROCESSORS AND MICROCONTROLLERS LAB

I . Microprocessor 8086:

Introduction to MASM/TASM.

Arithmetic operation – Multi byte addition and subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.

Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.

By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.

Modular Program: Procedure, Near and Far implementation, Recursion.

Dos/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. Interfacing

8259 – Interrrupt Controller.

8279 – Keyboard Disply.

8255 – PPI.

8251 – USART.

III. Mcrocontroller 8051:

1.   Reading and Writing on a parallel port.
2.   Timer in different modes.
3.   Serial communication implementation.
4.   Understanding three memory areas of 00 – FF (Programs using above areas).
5.   Using external interrupts
6.   Programs using special instructions like swap, bit/byte, set/reset etc.
7.   Programs based on short, page, absolute addressing.

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CONTROL SYSTEMS LAB-I

1. Characteristics of synchro transducer, synchro receiver and control transformers.
2. Gain control of the output of DC amplifier with and without chopper stabilization.
3. Torque-displacement characteristics of the stepper motor using A/D converters.
4. Control characteristics of magnetic amplifier with and without feedback.
5. Shaft angle encoder, decoder, output characteristics.
6. Response of a first order system, with RC (simulated T/F) components on X-Y plotter / servo scope.
7. Error comparators-ganged potentiometer and systems potentiometer sensitivity determination.
8. Pneumatically operated PID controller, with independent gain control of PI and D control loops of a step input response.
9. Step function response of the second order system on MATLAB – control of transient and steady state performances.
10. Plotting root locus for selected transfer functions using MATLAB.
11. Plot of frequency domain measurements for selective transfer functions – Bode, Nyquist. Determination of gain and phase margins.
12. Obtaining state space model of a classical transfer function using MATLAB.

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IV YEAR B.TECH E.Cont.E I-Sem

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NEURAL NETWORKS AND FUZZY LOGIC

Objective :
This course introduces the basics Neural Networks and essentials of Artificial Neural Networks with Single Layer and Multilayer Feed Forward Networks. Also deals with Associate Memories and introduces Fuzzy sets and Fuzzy Logic system components. The Neural Network and Fuzzy Network system application to Electrical Engineering is also presented. This subject is very important and useful for doing Project Work.

Unit – I: Introduction to Neural Networks
Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Hodgkin-Huxley Neuron Model, Integrate-and-Fire Neuron Model, Spiking Neuron Model, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

Unit- II: Essentials of Artificial Neural Networks
Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Neural Dynamics (Activation and Synaptic), Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules, Types of Application

Unit–III: Single Layer Feed Forward Neural Networks
Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Perceptron Convergence theorem, Limitations of the Perceptron Model, Applications.

Unit- IV: Multilayer Feed forward Neural Networks
Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

Unit V: Associative Memories
Paradigms of Associative Memory, Pattern Mathematics, Hebbian Learning, General Concepts of Associative Memory (Associative Matrix, Association Rules, Hamming Distance, The Linear Associator, Matrix Memories, Content Addressable Memory), Bidirectional Associative Memory (BAM) Architecture, BAM Training Algorithms: Storage and Recall Algorithm, BAM Energy Function, Proof of BAM Stability Theorem
Architecture of Hopfield Network: Discrete and Continuous versions, Storage and Recall Algorithm, Stability Analysis, Capacity of the Hopfield Network
Summary and Discussion of Instance/Memory Based Learning Algorithms, Applications.

Unit – VI: Classical & Fuzzy Sets
Introduction to classical sets - properties, Operations and relations; Fuzzy sets,   Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

UNIT VII: Fuzzy Logic System Components
Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT VIII: Applications

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

Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

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

REFERENCE BOOKS:
1. Neural Networks – James A Freeman and Davis Skapura, Pearson, 2002.
2. Neural Networks – Simon Hakins , Pearson Education
3. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
4. Neural Networks and Fuzzy Logic System by Bart Kosko, PHI Publications.

IV YEAR B.TECH E.Cont.E I-Sem

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OBJECT ORIENTED PROGRAMMING

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:
AWT Controls: Buttons, Labels, Text fields, Text area, Check boxes, Check box groups, Lists, Choice, Scrollbars, Menus, Layout Managers – Flow, Border,Grid, Card and Gridbag.
Swing – JApplet, JFrame and JComponent, Icons and Labels, Handling threading issues, text fields, buttons – The JButton class, Check boxes, Radio buttons, Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.
Applets – Concepts of Applets, differences between applets and applications,life cycle of an applet, types of applets, creating applets, passing parameters to applets.

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:
1. The Complete Reference Java J2SE 5th Edition, Herbert Schildt, TMH
Publishing Company Ltd, NewDelhi./PHI
2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons.

REFERENCES:
1. Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson
Education.
2. Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh
Edition, Pearson Education.
3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell,
Seventh Edition, Pearson Education.
4. Beginning in Java 2, Iver Horton, Wrox Publications.

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DIGITAL CONTROL SYSTEMS

UNIT – I SAMPLING AND RECONSTRUCTION

Introduction, Examples of Data control systems – Digital to Analog conversion and Analog to Digital conversion, sample and hold operations.

UNIT-II   THE Z – TRANSFORMS

Introduction, Linear difference equations, pulse response, Z – transforms, Theorems of Z – Transforms, the inverse Z – transforms, Modified Z- Transforms

UNIT-III   Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM

Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT – IV   STATE SPACE ANALYSIS

State Space Representation of discrete time systems, Pulse Transfer Function Matrix solving discrete time state space equations, State transition matrix and it's Properties, Methods for Computation of State Transition Matrix, Discretization of continuous time state – space equations

UNIT – V   CONTROLLABILITY AND OBSERVABILITY

Concepts of Controllability and Observability, Tests for controllability and Observability. Duality between Controllability and Observability, Controllability and Observability conditions for Pulse Transfer Function

UNIT – VI   STABILITY ANALYSIS

Mapping between the S-Plane and the Z-Plane – Primary strips and Complementary Strips – Constant frequency loci, Constant damping ratio loci, Stability Analysis of closed loop systems in the Z-Plane. Jury stablility test – Stability Analysis by use of the Bilinear Transformation and Routh Stability criterion.

UNIT – VII   DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS

Transient and steady – State response Analysis – Design based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers.

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UNIT – VIII   STATE FEEDBACK CONTROLLERS AND OBSERVERS

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.
State Observers – Full order and Reduced order observers.

TEXT BOOKS:

1.   Discrete-Time Control systems - K. Ogata, Pearson Education/PHI, 2nd Edition

REFERENCE BOOKS:

1.   Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.
2.   Digital Control and State Variable Methods by M.Gopal, TMH

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IV YEAR B.TECH E.Cont.E I-Sem

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ADAPTIVE CONTROL SYSTEMS

UNIT I   INTRODUCTION
Concept of Adaptive Control, Definitions, Types of adaptivity, Effects of process variation, Control Essentials, Ratio of Adaptive Control, and Adaptive Systems.

UNIT II   REAL TIME PARAMETER ESTIMATION
Introduction to Parameter Estimation, Least Squares and Regression Models – Least Squares Estimation, Recursive Computation, Continuous-Time Models, Estimation Parameters in Dynamical Systems – Finite Impulse Response (FIR) Models, Transfer Function Models.

UNIT III DETERMINISTIC SELF TUNING REGULATORS
Introduction, Block Diagram, Pole Placement Design, Indirect Self Tuning Regulators(STR), Continuous – Time Self Tuners, Direct Self Tuning Regulators

UNIT IV STOCHASTIC SELF TUNING REGULATORS
Design of Minimum Variance and Moving Average Controllers – Minimum Variance Control, Nonminimum phase System, Moving Average Controller, LQG control, Stochastic Self Tuning Regulators, Unification of Direct Self Tuning Regulators, Linear Quadratic STR

UNIT V   STABILITY ANALYSIS
Introduction to Stability, Definitions, Theorems, Lyapunov theory on stability, Bounded Input – Bounded Output Stability.

UNIT VI MODEL REFERENCE ADAPTIVE SYSTEMS (MRAS)
Introduction – The MIT rules, Determination of Adaptation Gain, Design of MRAS using Lyapunov Theory, Output Feedback, Relations between MRAS and STR.

UNIT VII AUTO-TUNING
Introduction, PID Control, Auto-Tuning Techniques, Transient Response Methods, Methods based on Relay feedback, Relay oscillations.

UNIT VIII   GAIN SCHEDULING
Introduction, The principle, Design of Gain-Scheduling controllers, Nonlinear Transformations.

TEXT BOOKS:
1. Adaptive control by Karl.J.Astrom, Bjorn Wittenmark, Pearson Education, 2003.

REFERENCES:
1. Adaptive control systems by Misthkin and Braun – McGraw Hill
2. Digital control systems by P.N.Paraskevopoules Prentice Hall.

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DATABASE MANAGEMENT SYSTEMS
(ELECTIVE-I)

Objective:
Learn about database design concepts, data models (Entity-Relationship and Relational Model), the database query language SQL and components of a database management system. Further topics include query processing and optimization techniques, transaction management, and storage and file structures

UNIT – I:
Data base System Applications, data base System VS file System – View of Data – Data Abstraction – Instances and Schemas – data Models – the ER Model – Relational Model – Other Models – Database Languages – DDL – DML – database Access for applications Programs – data base Users and Administrator – Transaction Management – data base System Structure – Storage Manager – the Query Processor – History of Data base Systems.Data base design and ER diagrams – Beyond ER Design Entities, Attributes and Entity sets – Relationships and Relationship sets – Additional features of ER Model – Concept Design with the ER Model – Conceptual Design for Large enterprises.

UNIT – II:
Relational Model: Introduction to the Relational Model – Integrity Constraint Over relations – Enforcing Integrity constraints – Querying relational data – Logical data base Design – Introduction to Views – Destroying /altering Tables and Views.

Relational Algebra and Calculus: Relational Algebra – Selection and projection set operations – renaming – Joins – Division – Examples of Algebra overviews – Relational calculus – Tuple relational Calculus – Domain relational calculus – Expressive Power of Algebra and calculus.

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 – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.
UNIT – V:
Overview of Transaction Management: ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

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 base Indexing – Comparison of File Organizations – Indexes and Performance Tuning.

UNIT – VIII:
Storing data: Disks and Files: - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.
Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.
Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Exendble vs. Liner hashing.

Text Books:
1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
2. Data base System Concepts, Silberschatz, Korth, Mc.Graw hill, IV edition.

References:
1. Introduction to Database Systems, C.J.Date Pearson Education
2. Data base Systems design, Implementation, and Management, Rob & Coronel 5th Edition.Thomson
3. Data base Management System, Elmasri Navrate Pearson Education
4. Data base Management System Mathew Leon, Leon Vikas.
5. Data base Systems, Connoley Pearson education

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ROBOTICS AND AUTOMATION
(ELECTIVE-I)

UNIT – I BASIC CONCEPTS
Automation and Robotics – An over view of Robotics – present and future
applications – classification by coordinate system and control system, Dynamic
stabilization of Robotics.

UNIT – II   POWER SOURCES AND SENSORS
Hydraulic, Pneumatic and electric drivers – Determination HP of motor and gearing
ratio, variable speed arrangements, Path Determination - Machinery Vision –
Ranging – Laser – Acoustic, Magnetic Fiber Optic and Tactile Sensor

UNIT – III   MANIPULATORS
Construction of Manipulators, Manupulator Dynamic and Force Control, Electronic
and Pneumatic manupulators.

UNIT – IV   ACTUATORS AND GRIPPERS
Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effecter, Various
types of Grippers, Design consideration.

UNIT – V   TRANSFORMATION AND DYNAMICS
Differential transformation and manipulators, Jacobians – problems.Dynamics:
Lagrange – Euler and Newton – Euler formations – Problems.

UNIT VI KINEMATICS
Forward and Inverse Kinematic Problems, Solutions of Inverse Kinematic problems,
Multiple Solution, Jacobian Work Envelop – Hill Climbing Techniques.

UNIT VII   PATH PLANNING
Trajectory planning and avoidance of obstacles, path planning, Skew motion, joint
integrated motion – straight line motion – Robot programming, languages and
software packages.

UNIT VIII   CASE STUDY
Multiple Robots – Machine Interface – Robots in Manufacturing and Non-Manufacturing applications – Robot
Cell Design Selection of a Robot.

TEXT BOOKS:
1. Industrial Robotics / Groover M P /Pearson Edu.
2. Robotics / Fu K S/ McGraw Hill.

REFERENCES:

1. Robotics and Control / Mittal R K & Nagrath I J / TMH.
2. An Introduction to Robot Technology, / P. Coiffet and M. Chaironze / Kogam Page
   Ltd. 1983 London.
3. Robotic Engineering / Richard D. Klafter, Prentice Hall
4. Introduction to Robotics / John J Craig / Pearson Edu.

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INSTRUMENTATION AND CONTROL IN MANUFACTURING SYSTEMS
(ELECTIVE – I)

UNIT I
Introduction to manufacturing operations and systems :
Manufacturing industries and products, manufacturing operations, product/production relationships, production concepts, and mathematical models, costs of manufacturing operations, Components of a manufacturing systems, classifications of manufacturing systems, overview of the classification scheme, manufacturing progress functions (learning curves)

UNIT II
Introduction to automation & Industrial control Systems :
Basic elements of aim automated system, advanced automation functions, levels of automation, process industries, verse descrete manufacturing industries, continuous verses descrete control, computer process control, forms of computer process control,

UNIT – III
Numerical Control and Discrete Control Using PLC's, fundamental of NC technology, computer numerical, DNC, applications of numerical control, descrete process control, ladder logic diagrams, programmable logic controllers, personal computers using soft logic.

UNIT –IV
Industrial Robotics :
Robot anatomic and related attributes, robot control systems, end effectors, sensers in robotics, industrial robot applications, robot programming, Engineering analysis of industrial robots.

UNIT –V :
Flexibile manufacturing Systems :
What is an FMS ?, FMS Components, FMS applications, and benefits, FMS planning and implementation issues, fundamentals of automated assembly systems, design for auto0mated assembly, quantitative analysis of assembly systems.

UNIT –VI :
Quality assurance and statistical process control :
Quality defined, traditional and modern quality control, taguchi methods in quality engineering, ISO 9000, process variability, and process capability, and control charts, other SPC tools, implementing statistical process control.

UNIT –VII :
Quality inspection technologies :
Inspection metrology, contact verses non contact inspection techniques, conventional measuring and gauging techniques and coordinate measuring machines, surface measurement, machine vision, other optical inspection techniques, non-contact non-optical inspection technologies.

UNIT –VIII :
Process and Production Planning :
Process planning, computer- aided process planning (CAP), concurrent engineering and design for manufacturing, aggregate production planning and the master production scheduled, material requirements planning (MRP), capacity planning, shop floor control, inventory control.

TEXT BOOKS :
1. Mikell P.Grover, Automation, Production Systems and Computer Prentice Hall of India Pvt.Ltd. 1995.

REFERENCES:
1. A.Troitsky Principles of Automation and Automated Production Mir Publ., 1976.
2. C.Ray Astaihe, Robots and Manufacturing automation, John Wile and Sons, New York.

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SOFTWARE ENGINEERING
(ELECTIVE – II)

UNIT-I:
Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths
A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

UNIT-II
Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT-III
Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.
System models: Context Models, Behavioral models, Data models, Object models, structured methods.

UNIT-IV
Design Engineering: Design process and Design quality, Design concepts, the design model.
Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V
Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.
Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT-VI
Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT-VII
Metrics for Process and Products: Software Measurement, Metrics for software quality.
Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.
UNIT-VIII
Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS:
1. Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.McGrawHill International Edition.
2. Software Engineering- Sommerville, 7th edition, Pearson education.

REFERENCES:
1. Software Engineering- K.K. Aggarwal & Yogesh Singh,New Age International Publishers
2. Software Engineering, an Engineering approach- James F. Peters, Witold Pedrycz.
3. Systems Analysis and Design- Sheely Cashman Rosenblatt,3rd edition, Galgotia Publications.
4. Software Engineering principles and practice- Waman S Jawadekar, The McGraw-Hill Companies.

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HYDRAULIC AND PNEUMATIC CONTROL SYSTEMS
(ELECTIVE – II)

UNIT – I:
Introduction to Fluid Power, merits and utility of Fluid Power in industries. Difference between Hydraulic Systems & Pneumatic Systems. Fluid Power Components: Construction and operation of – Pump, Relief valve, Non-return valve, Pilot operated relief valve, Series and Parallel compensator of flow valve, Pressure compensated pump, motor, actuators, Seals used in the control systems.

UNIT – II:
Symbolic representation of Hydraulic and pneumatic Elements. Compressor and air line installations. Various types of Pumps used in hydraulic systems. Hydraulic Fluid and Effective contamination control. Purpose of Air-filters and types in Pneumatic systems.

UNIT – III:
Transmission System: Transmission of Fluid Power through various type of cylinders. Compressibility and inertia loading. Hydraulic stiffness, stiffness of pneumatic system. Component effectiveness, breakage, constant torque load, constant power load, inertia load, viscous damping.

UNIT –IV:
Valve controlled Systems: Flow through a single speed control valve, Series Pressure Compensation, combined directional and flow rate control valve, Steady reaction and Transient Reaction force.

UNIT – V:
Hydraulic and pneumatic circuits for different controls like – Sequencing circuit, counter balancing, indexing, linear motion, rotation & Hydro copying circuit. Electro-Pneumatics & Electro-Hydraulic controls, Hydro-Pneumatics, Cartridge valve design.

UNIT – VI:
Analysis of Accumulator Systems: Accumulator system dynamics, Thermodynamics, Thermodynamics consideration. Accumulator as Absorber of pressure shocks. Construction, operation and applications of Intensifier.

UNIT – VII:
Feed back Systems: Pressure control, Position control, Pump/motor systems. Control with variable capacity pumps. Pump stroke mechanisms. Position control using metering valve Double acting actuators.

UNIT – VIII:
Speed control, Inertia Load position control systems. Programmable sequential control using modular elements. Servo control systems. Trouble shooting and remedial measures in Hydraulic & Pneumatic Systems.

TEXT BOOKS:

1. Fluid Power Systems, by A.B. Goodinain, McMillan Press Ltd.
2. The Control of Fluid Power, by McCloy & Martin, Longman Publications.

REFERENCES:

1. Mechatronics, by Prof. C.V. Venkataramana, SBS Publishers and Distributors.
2. Production Drawing Practice, by Dr.P.Narsimha Reddy, T.A.Janardhan Reddy & C. Srinivas Rao, The Hi-Tech Publishers.

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EMBEDDED AND REAL TIME SYSTEMS
(ELECTIVE – II)

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
DESIGN TECHNOLOGY : Introduction, Automation, Synthesis, Parallel evolution of compilation and synthesis, Logic Synthesis, RT synthesis, Behavioral Synthesis, Systems Synthesis and Hardware/ Software Co-Design, Verification, Hardware/Software co-simulation, Reuse of intellectual property codes.

TEXT BOOKS :
1. Embedded System Design – A Unified Hardware/Software Introduction - Frank Vahid, Tony D. Givargis, John Wiley, 2002.
2. Embedded / Real Time Systems – KVKK Prasad, Dreamtech Press, 2005.

REFERENCES :
1. Embedded Microcomputer Systems – Jonathan W. Valvano, Brooks / Cole, Thompson Learning.
2. An Embedded Software Primer – David E. Simon, Pearson Ed., 2005.
3. Introduction to Embedded Systems – Raj Kamal, TMS, 2002.
4. Embedded Real Time Systems Programming – Sri Ram V Iyer, Pankaj Gupta, TMH, 2004.

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JAVA LAB

1. Write a Java program that prints all real solutions to the quadratic equation $ax^2 + bx + c = 0$. Read in a, b, c and use the quadratic formula. If the discriminant $b^2 - 4ac$ is negative, display a message stating that there are no real solutions.

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

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

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

5. Write a Java program for sorting a given list of names in ascending order.

6. Write a Java program to multiply two given matrices.

7. Write a Java Program that reads a line of integers, and then displays each integers, and the sum of all the integers (use string to kenizer class)

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

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

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

11. Write a Java program that:
a) Implements stack ADT.
b) Converts infix expression into Postfix form.

12. Write an applet that displays a simple message.

13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Other wise the interest rate is annual.

14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.

15. Write a Java program for handling mouse events.

16. Write a Java program for creating multiple threads

17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.

18. Write a Java program that lets users create Pie charts. Design your own user

interface (with swings & AWT)

19. Write a Java program that allows the user to draw lines, rectangles and OU.als.

20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

21. Write a Java program that illustrates how run time polymorphism is achieved.

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CONTROL SYSTEMS LAB – II

1. Open loop control of a relay servomechanism (ON-OFF control of a temperature in a heater bath).
2. Operation of Pneumatically operated pressure control system using pressure sensitive – bellows and LVDT as sensors.
3. Determination of the control characteristics of AC servomotor.
4. Transfer function of armature controlled DC servomotor with inertia and viscous damping.
5. DC motor speed control with regenerative and degenerative feedback and with tachogenerator in the feedback path.
6. DC position control system-output control with variation of control loop gain.
7. System identification for the frequency response of a filter (band pass+band elimination filter).
8. Pick and plan assignment of robot manipulator with microcontroller.
9. 4-1 line multiplexer with digital logic gates.
10. Design of phase lead and phase lag compensators using Bode plots.
11. Transfer function of a sample and zero order hold circuit.
12. Amplitude modulation of a low frequency, signal recovery after demodulation (effect of modulating frequency on the signal-noise ratio).

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INDUSTRIAL ELECTRONICS

UNIT I
DC AMPLIFIERS:
Need for DC amplifiers, DC amplifiers—Drift, Causes, Darlington Emitter Follower,
Cascode amplifier, Stabilization, Differential amplifiers—Chopper stabilization,
Operational Amplifiers, Ideal specifications of Operational Amplifiers, Instrumentation
Amplifiers.

UNIT II
REGULATED POWER SUPPLIES:
Block diagram, Principle of voltage regulation, Series and Shunt type Linear Voltage
Regulators, Protection Techniques— Short Circuit, Over voltage and Thermal
Protection.

UNIT III
SWITCHED MODE & IC REGULATORS :
Switched Mode voltage regulator, Comparison of Linear and Switched Mode Voltage
Regulators, Servo Voltage Stabilizer, monolithic voltage regulators Fixed and
Adjustable IC Voltage regulators, 3-terminal Voltage regulators—Current boosting

UNIT IV
SCR AND THYRISTOR:
Principles of operation and characteristics of SCR, Triggering of Thyristors,
Commutation Techniques of Thyristors—Classes A, B, C, D, E and F, Ratings of
SCR.

UNIT V
APPLICATIONS OF SCR IN POWER CONTROL:
Static circuit breaker, Protection of SCR, Inverters—Classification, Single Phase
inverters, Converters – single phase Half wave and Full wave.

UNIT VI
DIAC, TRIAC AND THYRISTOR APPLICATIONS:
Chopper circuits – Principle, methods and Configurations, Diac and Triac,
Triacs – Triggering modes, Firing Circuits, Commutation.

UNIT VII
INDUSTRIAL APPLICATIONS - I
Industrial timers -Classification, types, Electronic Timers – Classification, RC and
Digital timers, Time base Generators. Electric Welding – Classification, types and
methods of Resistance and ARC wielding, Electronic DC Motor Control.

UNIT VIII
INDUSTRIAL APPLICATIONS - II
High Frequency heating – principle, merits, applications, High frequency
Source for Induction heating.
Dielectric Heating – principle, material properties, Electrodes and their
Coupling to RF generator, Thermal losses and Applications.
Ultrasonics – Generation and Applications.

TEXT BOOKS:
1. Industrial and Power Electronics – G.K. Mithal and Maneesha Gupta, Khanna
Publishers, 19th Ed., 2003.
2. Integrated Electronics – J. Millman and C.C Halkias, McGraw Hill, 1972.
REFERENCES :
1. Electronic Devices and circuits – Theodore.H.Bogart, Pearson Education,6th
Edn., 2003.
2. Thyristors and applications – M. Rammurthy, East-West Press, 1977.
3. Integrated Circuits and Semiconductor Devices – Deboo and Burroughs, ISE.s

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ARTIFICIAL INTELLIGENCE
(ELECTIVE – III)

UNIT-I
Introduction : AI problems, foundation of AI and history of AI intelligent agents: Agents
and Environments, the concept of rationality, the nature of environments, structure of
agents, problem solving agents, problem formulation.

UNIT-II
Searching: Searching for solutions, uniformed search strategies – Breadth first search,
depth first search, Depth limited search, Iterative deepening depth first search bi-direction
search - comparison. Search with partial information (Heuristic search) Greedy best first
search, A* search, Memory bounded heuristic search, Heuristic functions.

UNIT-III
Local search Algorithms, Hill climbing, simulated, annealing search, local beam search,
genetical algorithms.
Constrain satisfaction problems: Backtracking search for CSPs local search for constraint
satisfaction problems.

UNIT-IV
Game Playing: Adversial search, Games, minimax, algorithm, optimal decisions in
multiplayer games, Alpha-Beta pruning, Evaluation functions, cutting of search.

UNIT-V
Knowledge Representation & Reasons logical Agents, Knowledge – Based Agents, the
Wumpus world, logic, propositional logic, Resolution patterns in propos ional logic,
Resolution, Forward & Backward. Chaining.

UNIT-VI
First order logic. Inference in first order logic, propositional Vs. first order inference,
unification & lifts forward chaining, Backward chaining, Resolution.

UNIT-VII
Planning – Classical planning problem, Language of planning problems, Expressiveness
and extension, planning with state – space search, Forward states spare search, Backward
states space search, Heuristics for stats space search. Planning search, planning with
state space search, partial order planning Graphs.

UNIT-VIII
Learning – Forms of learning, Induction learning, Learning Decision Tree, Statistical learning
methods, learning with complex data, learning with Hidden variables – The EM Algorithm,
Instance Based learning, Neural Networks.
TEXT BOOKS:

1. Artificial Intelligence – A Modern Approach. Second Edition, Stuart Russel, Peter
Norving, Pearson Education.
2. Artificial Intelligence, 3rd Edition, Patrick Henry Winston., Pearson Edition,

REFERENCES:

1. Artificial Intelligence , 2nd Edition, E.Rich and K.Knight (TMH).

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TELEMETRY AND TELECONTROL
(ELECTIVE – III)

UNIT – I: TELEMETRY PRINCIPLES
Introduction, Functional blocks of Telemetry system, Methods of Telemetry - Non
Electrical, Electrical, Pneumatic, Frequency, Power Line Carrier Communication .

UNIT – II: SYMBOLS AND CODES
Bits and Symbols, Time function pulses, Line and Channel Coding, Modulation
Codes. Intersymbol Interference.

UNIT – III: FREQUENCY DIVISION MULTIPLEXED SYSTEMS
FDM, IRIG Standard, FM and PM Circuits, Receiving end, PLL

UNIT – IV: TIME DIVISION MULTIPLEXED SYSTEMS
TDM-PAM, PAM /PM and TDM – PCM Systems. PCM reception. Differential PCM.
Introduction, QAM, Protocols.

UNIT – V: SATELLITE TELEMETRY
General considerations, TT&C Service, Digital Transmission systems, TT&C Subsystems,
Telemetry and Communications.

UNIT – VI: OPTICAL TELEMETRY
Optical fibers Cable – Sources and detectors – Transmitter and Receiving Circuits,
Coherent Optical Fiber Communication System.

UNIT – VII TELECONTROL METHODS - 1
Analog and Digital techniques in Telecontrol, Telecontrol apparatus – Remote
adjustment, Guidance and regulation.
UNIT – VIII   ; TELECONTROL METHODS –II
Telecontrol using information theory – examples of telecontrol system.

TEXT BOOKS:
1. Telemetry Principles – D. Patranabis, TMH
2. Telecontrol Methods and Applications of Telemetry and Remote Control – by
Swoboda G., Reinhold Publishing Corp., London, 1991

REFERENCES:
1. Handbook of Telemetry and Remote Control – by Gruenberg L., McGraw Hill,
New York, 1987.
2. Telemetry Engineering – by Young R.E., Little Books Ltd., London, 1988.
3 Data Communication and Teleprocessing System – by Housley T., PH Intl.,
Englewood Cliffs, New Jersey, 1987.

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VIRTUAL INSTRUMENTATION
(ELECTIVE - III)

UNIT–I:
Virtual Instrumentation: Historical perspective, advantages, block diagram and architecture of a virtual instrument, data-flow techniques, graphical programming in data flow, comparison with conventional programming. Development of Virtual Instrument using GUI, Real-time systems, Embedded Controller, OPC, HMI / SCADA software, Active X programming.

UNIT – II:
VI programming techniques: VIS and sub-VIS, loops and charts, arrays, clusters and graphs, case and sequence structures, formula nodes, local and global variables, string and file I/O, Instrument Drivers, Publishing measurement data in the web.

UNIT –III:
Data acquisition basics: Introduction to data acquisition on PC, Sampling fundamentals, Input/Output techniques and buses. ADC, DAC, Digital I/O, counters and timers, DMA, Software and hardware installation, Calibration, Resolution, Data acquisition interface requirements.

UNIT –IV:
VI Chassis requirements. Common Instrument Interfaces: Current loop, RS 232C/ RS485, GPIB.

UNIT –V:
Bus Interfaces: USB, PCMCIA, VXI, SCSI, PCI, PXI, Firewire. PXI system controllers, Ethernet control of PXI.

UNIT –VI:
Networking basics for office & Industrial applications, VISA and IVI.

UNIT – VII:
VI toolsets, Distributed I/O modules. Application of Virtual Instrumentation: Instrument Control, Development of process database management system

UNIT –VIII:
Simulation of systems using VI, Development of Control system, Industrial Communication, Image acquisition and processing, Motion control.

TEXT BOOKS:
1. Gary Johnson, LabVIEW Graphical Programming, Second edition, McGraw Hill, Newyork, 1997.
2. Lisa K. wells & Jeffrey Travis, LabVIEW for everyone, Prentice Hall, New Jersey, 1997.

REFERENCES:
1. Kevin James, PC Interfacing and Data Acquisition: Techniques for Measurement, Instrumentation and Control, Newnes,2000.

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MANAGEMENT INFORMATION SYSTEMS
(Elective – IV)

UNIT-I

Information systems in the enterprise : Why information systems, perspectives on information systems, contemporary approaches to information systems, four major types of systems in organizations-transaction processing systems, management information systems, decision support systems, executive support systems.

UNIT-II

Systems from a functional perspective- Sales and Marketing Systems, Manufacturing and Production Systems, Financial and Accounting Systems, Human Resources Systems. Integrating functions and business processes.

UNIT-III

The Digital Firm, Electronic Business and Electronic Commerce : Internet technology and the digital firm, categories of electronic commerce, customer centered retailing, business-to-business electronic commerce, commerce payments, electronic business, management opportunities, challenges and solutions.

UNIT-IV

The wireless revolution: business value of wireless networking, wireless transmission media and devices, cellular network standards and generations, wireless computer networks and internet access, M-commerce and Mobile computing, wireless technology in the enterprise.

UNIT-V

Security and control : system vulnerability and abuse, business value of security and control, establishing a management framework for security and control, technologies and tools for security and control.

UNIT-VI

Enterprise Applications and Business Process Systems : What are enterprise systems, How enterprise systems work, supply chain management systems, customer relationship management systems, enterprise integration trends.

UNIT-VII

Redesigning the organizations with information systems : systems as planned organizational change, business process reengineering and process improvement, overview of system development, alternative systems building approaches – traditional systems life cycle, prototyping, end-user development, application software package and outsourcing.

UNIT-VIII

Managing change and international information systems : The importance of change management in information systems success and failure, managing implementation, the growth of international systems, organizing international information systems, managing global systems, technology issues and opportunities for global value chains.

TEXT BOOKS:
1. Kenneth. C. Laudon, Jane P. Laudon & VM Prasad: Management Information Systems, 9/e, Pearson Education, 2005.
REFERENCES:
1. Henry C.Lucas, Jr. Information Technology-Strategic Decision Making for Managers, John Wiley & Sons, Inc, 2005.
2. James A. O'Brien, Introduction to Information Systems, TMH, New Delhi, 2002.
3. Steven Alter, Information Systems, Pearson Education, Fourth Edition, 2004.
4. Effy Oz, Management Information Systems, Third Edition, Thomson, 2002
5. W S Jawadekar, Management Information Systems, TMH, Second Edition, 2002.
6. Turban, Rainer, Potter, Information Technology, John Wiley & Sons, Inc.2003.

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PC BASED INSTRUMENTATION AND CONTROL
(ELECTIVE-IV)

UNIT –I : INTRODUCTION TO COMPUTERS :
Personal Computer, Operating System, I/O Ports, Plug-in-slots, PCI bus, Operators Interface. Computer Interfacing for Data Acquisition and Control – Interfacing Input Signals, Output system with continuous actuators.

UNIT – II: DATA ACQUISITION AND CONTROL USING STANDARD CARDS:
PC expansion systems, Plug-in Data Acquisition Boards; Transducer to Control room, Backplane bus – VXI

UNIT – III: PC PROGRAMMING CONSIDERATIONS
Using the command line interface; Assembly language programming; C and C++ programming; Data transfer; Scaling and linearization;

UNIT – IV: PROGRAMMABLE LOGIC CONTROLLER (PLC) BASICS:
Definition, overview of PLC systems, input/output modules, power supplies and isolators.

UNIT – V: BASIC PLC PROGRAMMING
Programming on-off inputs/ outputs. Creating Ladder diagrams

UNIT – VI: PLC FUNCTIONS
PLC Basic Functions, register basics, timer functions, counter functions.

Arithmetic functions, number comparison functions, Skip and MCR functions, data move systems. Utilizing digital bits, sequencer functions, matrix functions.

UNIT – VII: PLC ADVANCED FUNCTIONS:
Analog PLC operation, networking of PLC, PLC-PID functions.

UNIT – VIII: RELATED TOPICS
Alternate programming languages. Auxiliary commands and functions. PLC installation, troubleshooting and maintenance.
Field bus: Introduction, concept. HART protocol: Method of operation, structure, and applications. Smart transmitters, smart valves and smart actuators.

TEXT BOOKS:

1. John. W .Webb Ronald A Reis , Programmable Logic Controllers - Principles and Applications, Fourth edition, Prentice Hall Inc., New Jersey, 1998.
2. Computer Control of Processes – M.Chidambaram. Narosa 2003

REFERENCES:

1. PC Based Instrumentation and Control Third Edition by Mike Tooley ; Elsevier
2. PC Interfacing and Data Acquisition Techniques for Measurement, Instrumentation and Control. By Kevin James; Elsevier
3. Practical Data Acquisition for Instrumentation and Control Systems by John Park and Steve Mackay
4. Programmable Logic Controllers, Second edition, Frank D. Petruzella, McGraw Hill, Newyork, 1997.

IV YEAR B.TECH E.Cont.E II-Sem   **T   P   C**
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WIRELESS COMMUNCIATIONS AND NETWORKS
(ELECTIVE – IV)

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
INTRODUCTION TO WIRELESS NETWORKING : Introduction, Difference between wireless and fixed telephone networks, Development of wireless networks, Traffic routing in wireless networks.

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 WLL Technology.

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

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

TEXT BOOKS :
1.   Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn., 2002.
2. Wireless Communication and Networking – William Stallings, PHI, 2003.

REFERENCES :
1. Wireless Digital Communications – Kamilo Feher, PHI, 1999.
2. Principles of Wireless Networks – Kaveh Pah Laven and P. Krishna Murthy, Pearson Education, 2002.
3. Wireless Communications – Andreaws F. Molisch, Wiley India, 2006.
4. Introduction to Wireless and Mobile Systems – Dharma Prakash Agarwal, Qing-An Zeng, Thomson 2nd Edition, 2006.