

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

B.TECH. ELECTRONICS & CONTROL ENGINEERING

I Year

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
HS05231	English	2+1*	-	4
MA05363	Mathematics – I	3+1*	-	6
PY05047	Applied Physics	2+1*	-	4
MA05361	Mathematical Methods	3+1*	-	6
CS05106	C Programming & Data Structures	3+1*	-	6
EE05189	Electrical Circuits	2+2*	-	4
EC05210	Electronic Devices & Circuits	3+1*	-	6
ME05220	Engineering Drawing Practices Lab	-	3	4
CS05144	Computer Programming Lab	-	3	4
EC05211	Electronic Devices & Circuits Lab	-	3	4
ME05230	Engineering Workshop Practice	-	3	4
HS05232	English Language Communication Skills Lab	-	3	4
TOTAL		26	15	56

II Year **I Semester**

CODE	SUBJECT	T	P	C
MA05365	Mathematics – III	4+1*	-	4
EE05200	Electrical Technology	4+1*	-	4
EE05205	Electromagnetic Fields	4+1*	-	4
EC05517	Signals & Systems	4+1*	-	4
EN05326	Instrumentation Components	4+1*	-	4
EE05539	Switching Theory & Logic Design	4+1*	-	4
EE05201	Electrical Technology Lab	-	3	2
EE05190	Electrical Circuits Lab	-	3	2
TOTAL		30	6	28

ACADEMIC REGULATIONS
COURSE STRUCTURE
AND

DETAILED SYLLABUS

**ELECTRONICS &
CONTROL ENGINEERING**

Shon

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2005-2006)



JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KUKATPALLY, HYDERABAD - 500 072.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

B.TECH. ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

II Year		II Semester			
CODE	SUBJECT	T	P	C	
HS05353	Managerial Economics & Financial Analysis	4+1*	-	4	
CE05239	Environmental Studies	4+1*	-	4	
EN05186	Electrical and Electronic Measurements	4+1*	-	4	
EE05149	Control Systems	4+1*	-	4	
EC05497	Pulse and Digital Circuits	4+1*	-	4	
EN05555	Transducers	4+1*	-	4	
EC05498	Pulse and Digital Circuits Lab	-	3	2	
EN05328	Instrumentation Lab	-	3	2	
TOTAL		30	6	28	

III Year

I Semester

CODE	SUBJECT	T	P	C	
CS05140	Computer Organization	4+1*	-	4	
CS05435	Operating Systems	4+1*	-	4	
EC05471	Principles of Communications	4+1*	-	4	
ME05436	Operations Research	4+1*	-	4	
EC05342	Linear & Digital IC Applications	4+1*	-	4	
EN05478	Process Control	4+1*	-	4	
EC05301	IC Applications Lab	-	3	2	
EE05151	Control Systems Lab – I	-	3	2	
TOTAL		30	6	28	

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COURSE STRUCTURE

III Year		II Semester			
CODE	SUBJECT	T	P	C	
CS05138	Computer Networks	4+1*	-	4	
EC05400	Microprocessors & Interfacing	4+1*	-	4	
EC05176	Digital Signal Processing	4+1*	-	4	
HS05352	Management Science	4+1*	-	4	
ME05508	Robotics & Automation	4+1*	-	4	
EE05006	Advanced Control Systems	4+1*	-	4	
EC05401	Microprocessors Lab	-	3	2	
EE05152	Control Systems Lab – II	-	3	2	
TOTAL		30	6	28	

IV Year

I Semester

CODE	SUBJECT	T	P	C	
CS05434	OOPS Through JAVA	4+1*	-	4	
EE05425	Neural Networks & Fuzzy Logic	4+1*	-	4	
EC05170	Digital Control Systems	4+1*	-	4	
IC05001	Adaptive Control Systems	4+1*	-	4	
EN05504	ELECTIVE – I	4+1*	-	4	
EN05504	Reliability and Safety Engineering				
CS05159	Database Management Systems				
EC05574	VLSI Design				
EN05179	ELECTIVE – II	4+1*	-	4	
EN05179	Distributed Computer Control Systems				
ME05427	Non-conventional Sources of Energy				
CS05216	Embedded Systems				
CS05338	JAVA Lab	-	3	2	
EE05153	Control Systems Lab – III	-	3	2	
TOTAL		30	6	28	

B.TECH. ELECTRONICS & CONTROL ENGINEERING
COURSE STRUCTURE

IV Year		II Semester		
CODE	SUBJECT	T	P	C
CS05308	Industrial electronics ELECTIVE – III	4+1*	-	4
CS05048	Artificial Intelligence	4+1*	-	4
EN05544	Telemetry and Telecontrol			
CS05521	Software Engineering ELECTIVE – IV	4+1*	-	4
EI05351	Management Information Systems			
EN05136	Computer Aided Design of Control Systems			
EC05582	Wireless Communications and Networks			
CA05315	Industry Oriented Mini Project	-	-	2
CA05515	Seminar	-	-	2
CA05495	Project Work	-	-	12
TOTAL		15	-	28

NOTE: All University Examinations (Theory and Practical) are of 3 hours duration.

* : Tutorials

T : Theory periods per week

P : Practical /Drawing Periods per week

C : Total Credits for the subject

I Year B.Tech. E.Cont.E
(HS 05231) ENGLISH

T P C
2+1 0 4

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, to encourage them to develop their language skills. The two textbooks identified by the Board of Studies serve the purpose of illustrating the conceptual framework within which the syllabus is to be administered in the classroom. When a textbook is prescribed content is generally paid attention to. However, the stress in this syllabus is on language acquisition and skill development, calling for both the teacher and the taught to go beyond the prescribed texts and innovate exercises and tasks.

2. OBJECTIVES :

- To promote the language proficiency of the students with emphasis on improving their LSRW skills.
- To impart training to the students through the syllabus and its theoretical and practical components.
- To improve communication skills in formal and informal situations.

3. SYLLABUS :

Listening Skills :

- Listening for general content
- Listening to fill up information gaps
- Intensive listening
- Listening for specific information
- Note-taking - guided and unguided
- Post-listening testing

Speaking Skills :

- Oral practice
- Developing confidence
- Introducing oneself/others
- Asking for/ giving information
- Describing objects/offering solutions
- Describing situations
- Role play
- Expressing agreement/disagreement

Reading Comprehension

- 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 student, through the training imparted to him/her by means of the text-based approach, will be examined in answering questions on an unseen passage.

Writing Skills :

- Writing a sentence
- Use of appropriate vocabulary
- Paragraph writing
- Coherence and cohesiveness
- Narration / description
- Interpreting data
- Formal and informal letter writing
- Sending e-mails
- Information transfer
- 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:

1. **LEARNING ENGLISH:** A Communicative Approach, Hyderabad: Orient Longman, 2005. (Selected Lessons)
2. **WINGS OF FIRE:** An Autobiography – APJ Abdul Kalam, Abridged version with Exercises, Hyderabad: Universities Press (India) Pvt. Ltd., 2004.

The following lessons from the prescribed texts are recommended for study :

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

Reading and Writing Skills
Reading Comprehension
Situational dialogues
Report writing
Letter writing

Essay writing
Information transfer

Unit – VIII

Remedial English

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I Year B.Tech. E.Cont.E

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Common errors
Subject-Verb agreement
Use of Articles and Prepositions
Tense and aspect

Vocabulary – Synonyms & Antonyms, one-word substitutes, prefixes & suffixes, Idioms & phrases, words often confused.

TEXT BOOKS

- Effective Technical Communication**, M Ashraf Rizvi, Tata McGraw-Hill Publishing Company Ltd.
- Everyday Dialogues in English**, Robert J Dixon, Prentice Hall of India Pvt Ltd., New Delhi.

REFERENCES

- Strengthen Your English**, Bhaskaran & Horsburgh, Oxford University Press
- English for Technical Communication**, K R Lakshminarayana, SCITECH
- Strategies for Engineering Communication**, Susan Stevenson & Steve Whitmore (John Wiley and sons).
- English for Engineers: With CD**, Sirish Chaudhary, Vikas Publishing House Pvt. Ltd. With CD.
- Basic Communication Skills for Technology**, Andrea J Rutherford, Pearson Education Asia.
- Murphy's English Grammar with CD**, Murphy, Cambridge University Press
- A Practical Course in English Pronunciation, (with two Audio cassettes)**, Sethi, Sadanand & Jindal , Prentice –Hall of India Pvt Ltd., New Delhi.
- English for Professional Students**, by S S Prabhakara Rao.
- The Oxford Guide to Writing and Speaking**, John Seely, Oxford.
- Grammar Games**, Renvolucrri Mario, Cambridge University Press.

(MA 05363) MATHEMATICS – I**UNIT – I**

Sequences – series – Convergences and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence. Rolle's theorem – Lagrange's Mean Value Theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem).

UNIT – II

Functions of several variables – Functional dependence- Jacobian- Maxima and Minima of functions of two variables with constraints or without constraints- Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

UNIT – III

Curve tracing – Cartesian, polar and Parametric curves - Applications of integration to lengths, volumes and surface areas in Cartesian and polar coordinates.

UNIT – IV

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- 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 – V

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.

UNIT – VI

Multiple integrals - double and triple integrals – change of variables – change of order of integration.

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.

UNIT – VIII

Vector integral theorems: Green's theorem- Stoke's and Gauss's Divergence Theorem. Verification of Green's - Stoke's and Gauss's Theorems – Cylindrical, Spherical coordinates-Expressions Grad, div, curl in spherical and cylindrical coordinates.

TEXT BOOKS :

1. A text book of Engineering Mathematics Volume – 1, 2005
T.K.V.Iyengar, B.Krishna Gandhi and others, S.Chand and Company.
2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

REFERENCES :

1. Engineering Mathematics-I, 2002, P.Nageswara Rao, Y.Narsimhulu, Prabhakara Rao, Deepthi Publishers
2. Engineering Mathematics- I, 2004, Dr.Shahnaz Bahul, Right Publishers.
3. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S. Publications 2000.
4. Engineering Mathematics-I Rukmangadhachary, Pearson Education.
5. A Text book of Engineering Mathematics, VP Mishra, Galgotia Publications.
6. Engineering Mathematics – I, Sankaralah, VGS Book Links, Hyderabad.

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I Year B.Tech. E.Cont.E

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(PY 05047) APPLIED PHYSICS

UNIT I

BONDING IN SOLIDS : Introduction - Types of Bonding - Ionic bond - Covalent bond - Metallic bond - Cohesive energy - Calculation of Cohesive energy.

CRYSTAL STRUCTURES : Introduction - Space lattice - Basis - Unit cell - Lattice parameter - Crystal systems - Bravais lattices - Structure and Packing fractions of Simple cubic - Body Centred Cubic - Face Centred Cubic crystals - Structures of Diamond, ZnS, NaCl, CsCl.

UNIT II

CRYSTAL PLANES & XRAY DIFFRACTION : 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 III

DEFECTS IN SOLIDS : Imperfections in Crystals - Point defects - Schottky and Frenkel defects - Energy for formation of a Vacancy - Equilibrium concentration of Schottky and Frenkel defects - Line defects - Edge and Screw dislocations - Burger's Vectors.

PRINCIPLES OF QUANTUM MECHANICS : Waves and Particles - Planck's quantum theory - de-Broglie hypothesis – Matter waves - Davission and Germer experiment - Schroedinger's Time Independent Wave equation - Physical significance of the Wave function - Particle in a one dimensional potential box.

UNIT IV

ELECTRON THEORY OF METALS : Classical free electron theory - Mean free path - Relaxation time and drift velocity - Fermi-Dirac distribution (descriptive) - Quantum free electron theory - Sources of electrical resistance - Kronig-Penney model (qualitative treatment) - Origin of energy band formation in solids - Concept of effective mass.

UNIT V

DIELECTRIC PROPERTIES:Introduction - Dielectric constant - Electronic, Ionic and Orientation polarizabilities - Internal fields - Clausius-Mossotti equation – 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 - anti-Ferro and Ferri magnetism - Ferrites and their applications.

UNIT VI

SEMICONDUCTORS : Introduction - Intrinsic semiconductor and carrier concentration – Equation for conductivity - Extrinsic semiconductor and carrier concentration - Drift and diffusion - Einstein's equation - Hall effect.

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(MA 05361) MATHEMATICAL METHODS

UNIT VII

LASERS : Introduction - Characteristics of Lasers - Spontaneous and Stimulated Emission of radiation - Einstein's coefficients - Population inversion - Ruby Laser - Helium-Neon Laser - Semiconductor Laser - Applications of Lasers in Industry, Scientific and Medical fields.

UNIT VIII

FIBER OPTICS : Introduction - Principle of optical fiber - Acceptance angle and Acceptance cone - Numerical aperture - Step-Index fiber and transmission of signal in SI fiber - Graded-Index fiber and transmission of signal in GI fiber - Attenuation in optical fibers - Advantages of optical fibers in communication - Application of optical fibers in Medicine and Sensors.

TEXTBOOKS :

1. Applied Physics by Dr. M.Chandra Shekar & Dr.P.Appala Naidu. V.G.S. Book links.
2. Solid State Physics by P.K. Palanisamy, Scitech Publications (India) Pvt.ltd.

REFERENCES :

1. Materials Science and Engineering by V. Raghavan. Prentice-Hall India
2. Materials Science by M.Artnugam; Anuradha Agencies
3. Solid State Physics by N.W. Ashcroft & N.David Merwin, Thomson Learning
4. Solid State Physics by Dr. B.S.Bellubbi & Dr. Adeel Ahmad; Premier Publishing house
5. Solid State Physics by Mani Naidu; Vijayan Publications
6. Materials Science by M.S.Vijaya & G. Rangarajan; Tata McGraw Hill
7. Introduction to Solid State Physics by C.Kittel; Wiley Eastern limited

I Year B.Tech. E.Cont.E

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UNIT - I

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 - II

Fitting a straight line –Nonlinear curve fitting –Curve fitting by a sum of exponentials-Weighted least squares approximation-Linear weighted least squares approximation-Nonlinear weighted least squares. Numerical Differentiation and Integration: The Cubic Spline Method – Trapezoidal rule – Simpson's 1/3 Rule –Simpson's 3/8 Rule- Boole's and Weddle's Rules .

UNIT - III

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 – IV

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 - V

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

UNIT - VI

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 –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. A Text book of Engineering Mathematics Volume – II, 2005 T.K.V.Jyengar, B.Krishna Gandhi and others, S.Chand and Company.
2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

REFERENCES :

1. Engineering Mathematics–II, 2002, P.Nageswara Rao, V.Narisimhulu, Prabhakara Rao
2. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S.Publications 2000.
3. Advanced Engineering Mathematics (eighth edition), Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. 2001.
4. Advanced Engineering Peter V.O'Neil Thomson Brooks/Cole.
5. Advanced Engineering Mathematics, Merle C.Potter, J.L.Goldberg, E.F.Abrufadel, Oxford University Press. Third Edition 2005.
6. Numerical Methods: V N Vedamurthy ,Jyengar N Ch N Vikas pub. Reprint 2005
7. Numerical Methods: S.Arummugam & others. Scitech pub.
8. Elementary Numerical Analysis : An Algorithmic Approach: S.D.Conte and Carl.D.E.Boor, Tata Mac-Graw Hill.
9. Introductory Methods of Numerical Analysis: S.S.Sastry, Prentice Hall of India, Pvt Ltd.,
10. Engineering Mathematics – II, 2005, Sankarajah, VGS Book Links, Hyderabad.
11. Numerical Methods for Scientific and Engineering Computation: M.K.Jain, S.R.K. Jyengar, R.K.Jain, New Age International (P) Ltd.

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I Year B.Tech. E.Cont.E

T P C
3+1 0 6

(CS 05106) C PROGRAMMING AND DATA STRUCTURES

UNIT - I

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types and sizes, declaration of variables, assigning values, arithmetic, relational and logical operator, increment and decrement operators, conditional operator, bit-wise operators, type conversions, expressions, evaluation, input-output statements, blocks, if and switch statement, while, do-while and for statements, C programs covering all the above aspects.

UNIT - II

One dimensional & Two dimensional arrays, initialization, string variables-declaration, reading, writing, Basics of functions, Parameter passing,String handling function, user-defined functions, recursive functions, variables and storage classes, scope rules, block structure, header files, C preprocessor, example C programs.

UNIT - III

Pointer and Arrays : Pointers and addresses. Pointers and Arrays. Pointers And function arguments, Address arithmetic, character pointers and functions, pointers to pointers, multi-dimensional arrays, initialization of pointer arrays, command line arguments, pointers to functions.

UNIT - IV

Structures : Definition, initializing, assigning values, passing of structures as arguments, Arrays of structures, pointers to structures, self referential structures. Unions, typedef, bit fields, C program examples.

UNIT - V

Console & File I/O : Standard I/O, Formatted I/O, opening & closing of files, I/O operations on files.

UNIT - VI

Linear DataStructures : Introduction to DataStructures, representing stacks and queues in C using arrays, Infix, Postfix & Prefix programs, circular queues.

UNIT - VII

Linked Lists : Singly linked list, Doubly linked list, Circular List, representing stacks and Queues in C using linked lists

Non-Linear Data Structures : Binary trees: Representation, tree traversals, graph representation, graph traversal, Spanning trees.

UNIT - VIII

Sorting & Searching : Searching Methods- Linear and binary search methods, Sorting methods- Ex:

Bubble sort, Selection sort, Insertion sort, heap sort, quick sort.

TEXT BOOKS :

1. C And Data structures – P.Padmanabham, BS Publications
2. C & Data Structures, Ashok N.Kamthane, Pearson Education

REFERENCES :

1. C & Data Structures – Prof. P.S.Deshpande, Prof. O.G.Kakde, Wiley Dreamtech Pvt. Ltd., NewDelhi.
2. DataStructures Using C – A.S.Tanenbaum, PHII/Pearson education
3. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHII/Pearson Education

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I YEAR B.Tech. E.Cont.E

**T P C
2+2 0 4**

(EE05189) ELECTRICAL CIRCUITS

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 MAGNETIC CIRCUITS

Magnetic Circuits – Faraday's laws of electromagnetic induction – concept of self and mutual inductance – dot convention – coefficient of coupling – composite magnetic circuit - Analysis of series and parallel magnetic circuits

UNIT – III SINGLE PHASE A.C CIRCUITS

R.M.S and Average values and form factor for different periodic wave forms, Steady state analysis of R, L and C (in series, parallel and series parallel combinations) with sinusoidal excitation – Concept of Reactance, Impedance, Susceptance and Admittance – Phase and Phase difference – concept of power factor, Real and Reactive powers – J-notation, Complex and Polar forms of representation, Complex power – Locus diagrams – series R-L, R-C, R-L-C and parallel combination with variation of various parameters – Resonance – series, parallel circuits, concept of band width and Q factor.

UNIT – IV THREE PHASE CIRCUITS

Three phase circuits: Phase sequence – Star and delta connection – Relation between line and phase voltages and currents in balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of active and reactive power.

UNIT – V NETWORK TOPOLOGY

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

UNIT – VI NETWORK THEOREMS

Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for d.c. and a.c. excitations.

UNIT – VII TRANSIENT ANALYSIS

Transient response of R-L, R-C, R-L-C circuits (Series and Parallel combinations) for d.c. and sinusoidal excitations – Initial conditions – Classical method and Laplace transforms methods of solutions.

UNIT – VIII NETWORK PARAMETERS

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

TEXT BOOKS:

1. Engineering circuit analysis – by William Hayt and Jack E. Kemmerly, Mc Graw Hill Company, 6th edition.
2. Network Theory: - N.C. Jagan & C.Lakshminarayana, B.S Publications .

REFERENCES:

1. Network Analysis by Vanvalkenburg, PHI.
2. Electric Circuit theory by K. Rajeswaran, Pearson Education, 2004.
3. "Circuits" by Carlson, Thomson Publishers.
4. Network Analysis: - C.K. Mithal, Khanna Publishers.
5. Electric Circuits by A. Chakrabarthy, Dhanipat Rai & Sons.
6. Linear circuit analysis (time domain phasor, and Laplace transform approaches) Second edition by RAYMOND A.DeCARLO and PEN-MIN-LIN, Oxford University Press. Second edition 2004.

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I YEAR B.Tech. E.Cont.E

T P C
3+1 0 6**(EC05210) 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). Applications of CRO: Voltage, Current and Frequency Measurements.

UNIT II JUNCTION DIODE CHARACTERISTICS

Review of semi conductor Physics – n and p –type semi conductors, Mass Action Law, Continuity Equation, Hall Effect, Open-circuited p-n junction, The p-n junction as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Energy band diagram of p-n diode, Volt-ampere characteristics of p-n diode, Temperature dependence of V_I characteristic, Transition and Diffusion capacitances, Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Characteristics of Tunnel Diode, Varactor 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 Π section filter, and comparison of various filter circuits in terms of ripple factors, Simple circuit of a regulator using zener diode, Series and Shunt voltage regulators

UNIT IV TRANSISTOR CHARACTERISTICS

Construction, principle of operation, V-I characteristics, symbol, equivalent circuit, parameter calculations, applications, and specifications of – BJT, FET, and MOSFETS, Enhancement and Depletion mode MOSFET, Salient features of different configuration of BJT and FET. Introduction to SCR, UJT, LED and Photodiode.

UNIT V BIASING AND STABILISATION

BJT biasing, DC equivalent model, criteria for fixing operating point, methods of Bias stabilization, Thermal run away, Thermal stability, Biasing of JFET and MOSFET, Comparison of BJT, JFET and MOSFET devices.

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. FET and MOSFET Small signal model. (C.G, C.D, C.S configurations) R.C Coupled Amplifiers using BJT and JFET, Concepts of f_{α} , f_{β} and f_T .

UNIT VII FEEDBACK AMPLIFIERS

Concept of feedback, Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Simple problems.

UNIT VIII OSCILLATORS

Condition for oscillations, RC and LC type Oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz, Hartley, and Colpitts Oscillators, RC-phase shift and Wien-bridge oscillators.

TEXT BOOKS:

1. Electronic Devices and Circuits – J.Millman and C.C.Halkias, Tata McGraw Hill, 1998.
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 – K. Lal Kishore, B.S. Publications, 2nd Edition, 2005

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I YEAR B.Tech. E.Cont.E

T P C
0 3 4**(ME05220) ENGINEERING DRAWING PRACTICE LAB****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 graphics K.I.Narayana & P.Kannayya
2. Engineering drawings N.D.Bhatt

I YEAR B.Tech. E.Cont.E

T P C
0 3 4

(CS05144) COMPUTER PROGRAMMING LAB

- Write a C program to evaluates the following algebraic expressions after reading necessary values from the user:
 - $ax+b/ax-b$
 - $2.5 \log x + \cos 32^0 + |x^2 - y^2| + v 2xy$
 - $1/\alpha \sqrt{2\pi} e^{- (x-m)/\sqrt{2\sigma}^2}$
- Write a C program for the following
 - Printing three given integers in ascending order
 - Sum of $1 + 2 + 3 + \dots + n$
 - $1 + x^2/2! + x^4/4! + \dots$ upto ten terms
 - $x + x^3/3! + x^5/5! + \dots$ upto 7th digit accuracy
- Read x and compute $Y=1$ for $x > 0$
 $Y=0$ for $x = 0$
 $Y = -1$ for $x < 0$
- Write C program using FOR statement to find the following from a given set of 20 integers.
 - Total number of even integers.
 - Total number of odd integers.
 - Sum of all even integers.
 - Sum of all odd integers.
- Write a C program to obtain the product of two matrices A of size (3X3) and B of size (3X2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.
- Using switch-case statement, write a C program that takes two operands and one operator from the user, performs the operation and then prints the answer. (consider operators +, -, /, * and %).
- Write C procedures to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.
- The total distance traveled by vehicle in 't' seconds is given by distance = $ut + \frac{1}{2}at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec²). Write C program to find the distance traveled 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'.

- A cloth show room has announced the following seasonal discounts on purchase of items.

PURCHASE	Discount (Percentage)	Handloom items
Amount	Mill Cloth	5.0
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using Switch and If statements to complete the net amount to be paid by a customer.

- Given a number, write a C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

- The Fibonacci sequence of numbers is 1, 1, 2, 3, 5, 8... based on the recurrence relation
 $f(n) = f(n-1) + f(n-2)$ for $n > 2$.
Write a C program using do-while to calculate and print the first n fibonacci numbers.

- Write C programs to print the following outputs using For loop.

```

1      1
2      2  2
3      3  3  3
4      4  4  4  4
5      5  5  5  5  5

```

- Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

- A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	Month of Sales	Price (Rs).
Maruthi – 800	02/87	75,000
Maruthi – DX	07/87	95,000
Gypsy	04/88	1,10,000
Maruthi Van	08/88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

14. Write a function that will scan a character string passed as an argument and convert all lower case characters into their upper case equivalents.
15. Implement the following data structures using Arrays
 - i) Stacks
 - ii) Linear Queues
 - iii) Circular queues
16. Implement binary search tree using linked list and perform the following operations.
 - i) Insertion
 - ii) Deletion
 - iii) Inorder Traversal
 - iv) Preorder Traversal
 - v) Post Order Traversal.
17. Singly linked list and doubly linked lists
 - i) Insertion
 - ii) Deletion
 - iii) Lookup
18. i) Implement stack using singly linked list.
ii) Implement queue using singly linked list.
19. Implement the following sorting techniques.
 - i) Bubble sort
 - ii) Insertion Sort
 - iii) Quick Sort
 - iv) Heap Sort.
20. Implement the following searching method.
 - i) Sequential Search
 - ii) Binary Search
21. i) Conversion of Infix expression to Postfix notation.
ii) Simple expression evaluator, that can handle +, -, / and *.
22. Implement the algorithms for the following iterative methods using C to find one root of the equation

$$9x_1 + 2x_2 + 4x_3 = 0$$

$$x_1 + 10x_2 + 4x_3 = 6$$

$$2x_1 - 4x_2 + 10x_3 = -15.$$
23. Write Computer programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.
24. Implement in 'C' the linear regression and polynomial regression algorithms.
25. Implement Traezoidal and Simpson methods.

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I YEAR B.Tech. E.Cont.E

(EC05211) ELECTRONIC DEVICES AND CIRCUITS LAB
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PART A:-
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
6. 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. Colpits Oscillator.
19. SCR characteristics.

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I YEAR B.Tech. E.Cont.E

T P C
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(ME05230) ENGINEERING WORKSHOP PRACTICE

SYLLABUS

1. TRADES FOR EXERCISES:

1. Carpentry
2. Fitting
3. Tin-Smithy and Development of jobs carried out and soldering.
4. Black Smithy
5. House-wiring
6. Foundry
7. IT Workshop-I : Computer hard ware, identification of parts, Disassembly, Assembly of computer to working condition, Simple diagnostic exercises.
8. IT workshop-II : Installation of Operating system windows and Linux, simple diagnostic exercises.

II TRADES FOR DEMONSTRATION & EXPOSURE:

1. Plumbing
2. Welding
3. Machine Shop
4. Power Tools in construction, Wood working, Electrical Engg & Mechanical Engg
5. Metal Cutting (water plasma)

Text Books: Work shop Manual / P.Kannaiah/ K.L.Narayana/ Scitech publishers

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. E.Cont.E

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(HS 05232) ENGLISH LANGUAGE COMMUNICATION SKILLS LAB

The language Lab focuses computer-aided multi-media instruction and language acquisition to achieve the following targets :

- To expose the students to a variety of self-instructional, learner-friendly modes of language learning.
 - 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.
 - To enable them to learn better pronunciation through stress on word accent, intonation, and rhythm.
 - To train them to use language effectively to face interviews, group discussions, public speaking.
 - To initiate them into greater use of the computer in resume preparation, report writing, format-making etc.
- However, depending upon the available infrastructure and budget, the above targets can also be achieved by procuring the minimum required equipment suggested for the establishment of a Conventional Lab the details of which are given below. The lab should cater to the needs of the students to build up their confidence to help them develop leadership qualities through their communicative competence.

SYLLABUS :

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

1. Introduction to Phonetics.
2. Introduction to Vowels and Consonants and associated Phonetic symbols.
3. Introduction to Accent, Intonation and Rhythm.
4. Situational Dialogues / Role Play.
5. Public Speaking.
6. Debate
7. Group discussions
8. Facing Interviews
9. Resume preparation
10. e-correspondence

Minimum Requirement :

- Computer aided multi media language lab with 30 systems with LAN facility.
- Conventional Language Lab. with audio and video systems, speakers, head phones and a teacher console to accommodate 30 students.

Suggested Software :

- Cambridge Advanced Learners' Dictionary with exercises
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kinderley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd
- Learning to Speak English - 4 CDs
- Microsoft Encarta
- Murphy's English Grammar, Cambridge
- Time series of IQ Test, Brain-teasers, Aptitude Test etc.
- English in Mind, Herbert Puchta and Jeff Stranks with Meredith Levy, Cambridge.

BOOKS SUGGESTED FOR ENGLISH LAB :

1. Developing Communication Skills by Krishna Mohan & Meera Benerji (Macmillan)
 2. Speaking English Effectively by Krishna Mohan & NP Singh (Macmillan)
 3. Better English Pronunciation by JDO Connor (UBS – Cambridge)
 4. Oxford Practice Grammar with Answers, John Eastwood, Oxford
 5. Handbook of English Grammar and Usage, Mark Lester and Larry Beason, Tata McGraw-Hill
 6. A text book of English Phonetics for Indian Students by T. Balasubramanian (Macmillan)
 7. Lingua TOEFL CBT Insider, by Dreamtech
 8. TOEFL & GRE (KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
 9. English Skills for Technical Students, WBSCTE with British Council, OL
 10. A Handbook of English for Competitive Examinations, by B Shyamala Rao, Blake Books, Chennai.
- DISTRIBUTION AND WEIGHTAGE OF MARKS :**
- ENGLISH LANGUAGE LABORATORY PRACTICE**
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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II YEAR B.Tech. E.Cont.E - I Semester

T P C
4+1 0 4**(MA05365) 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

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

$$(c) \int_a^b e^{imx} f(x) dx \quad (d) \text{ Integrals by indentation..}$$

UNIT – VII

Argument principle – Rouché'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 , $\ln z$, z^2 , z^n (n positive integer), $\sin z$, $\cos z$, $z + a/z$. Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties – invariance of circles and cross ratio – determination of bilinear transformation mapping 3 given points .

TEXT BOOKS:

1. A text book of Engineering Mathematics Volume – III, 2005
T.K.Vijayar, B.Krishna Gandhi and others, S.Chand and Company.
2. Engineering Mathematics, B.V.Ramana, Tata McGraw-Hill 2003.

REFERENCES:

1. Engineering Mathematics–III 2002, P.Nageswara Rao, Y.Narsimhulu, Prabhakara Rao
2. Engineering Mathematics, S.K.V.S. Sri Rama Chary, M.Bhujanga Rao, Shankar, B.S.Publications 2000.
3. Advanced Engineering Mathematics (eighth edition), Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. 2001.
4. Advanced Engineering Peter V.O'Neil Thomson Brooks/Cole.
5. Engineering Mathematics – III, 2005, Sankaralah, VGS Book Links, Hyderabad.

II YEAR B.Tech. E.Cont.E - I Semester

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(EE05200) 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. Kamakshiah, TMH Publ. Press, 2005
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 and D.P.Kothari, PHI Publications.
3. Essentials of Electrical and Computer Engineering by David V. Kerns, JR. J. David Irwin

(EE05205) ELECTROMAGNETIC FIELDS**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 – Gauss's law – Application of Gauss's Law – Maxwell's first law, $\text{div}(\mathbf{D}) = \rho_v$ – Laplace's and Poisson's equations – Solution of Laplace's equation in one variable

UNIT – II Dipole & Capacitance :

Electric dipole – Dipole moment – potential and EFI due to an electric dipole – Torque on an Electric dipole in an electric field – Capacitance – Capacitance of parallel plate and spherical capacitors

UNIT – III Conductors & Dielectrics :

Behavior of conductors in an electric field – Conductors and Insulators – Electric field inside a dielectric material – polarization – Dielectric – Conductor and Dielectric – Dielectric boundary conditions – 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 – 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, $\text{div}(\mathbf{B})=0$

UNIT – V Ampere's Law & 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, $\text{Curl}(\mathbf{H}) = \mathbf{J}_c$

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 – Neumann'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, $\text{Curl}(\mathbf{E}) = -\partial\mathbf{B}/\partial t$ – Static and Dynamically induced EMFs – Simple problems -Modification of Maxwell's equations for time varying fields – Displacement current

TEXT BOOKS:

1. "Engineering Electromagnetics" by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Edition, 2005.
2. "Engineering Electro magnetics" by Nathan Ida, Springer(India) Pvt. Ltd. 2nd Edition

REFERENCES:

1. "Introduction to E-Magnetics" by CR Paul and S.A. Nasar, Mc-Graw Hill Publications
2. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition
3. "Electromagnetics" by Plonsy and Collin
4. "Static and Dynamic Electricity" Smyth.
5. "Electromagnetics" by J P Tewari.
6. "Electromagnetics" by J. D Kraus Mc Graw-Hill Inc. 4th edition 1992.

(EC05517) SIGNALS AND SYSTEMS**UNIT I****SIGNAL ANALYSIS**

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

UNIT II**FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS**

Representation of Fourier series, Continuous time periodic signals, properties of Fourier series, Dirichlet's conditions, Trigonometric Fourier series and Exponential Fourier series, Complex Fourier spectrum

UNIT III**FOURIER TRANSFORMS**

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

UNIT IV**SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS**

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

UNIT V**CONVOLUTION AND CORRELATION OF SIGNALS**

Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy

density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

UNIT VI**SAMPLING**

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

UNIT VII LAPLACE TRANSFORMS

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

UNIT VIII**Z-TRANSFORMS**

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

TEXT BOOKS

1. 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. Signals & Systems Analysis Using Transformation Methods & MATLAB - Robert, TMH, 2003.
4. Signals, Systems and Transforms - C. L. Philips, J.M. Parr and Eve A. Riskin, Pearson education., 3rd Edition, 2004.

(EN05326) INSTRUMENTATION 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.

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: ELECTROMECHANICAL COMPONENTS

Transformers - Pulse transformers, Relays & Switches, Potentiometers, Synchros - Magnetic Amplifiers,

UNIT – IV: ELECTRICAL COMPONENTS

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.

REFERENCES:

- Gibson, T.E and Tetter F.B., Control System Components, McGraw Hill, New York, 1993.
- Greenwood, Mechanical Details for Product Design, McGraw Hill, New York, 1990.

(EE05539) 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 and 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 and Shift counters, Serial binary adder, sequence detector.

UNIT VII**SEQUENTIAL CIRCUITS - II**

Finite state machine-capabilities and limitations, Mealy and Moore models-minimization of completely specified and incompletely specified sequential machines, Partition techniques and Merger chart methods-concept of minimal cover table.

UNIT VIII**ALGORITHMIC STATE MACHINES**

Salient features of the ASM chart-Simple examples-System design using data path and control subsystems-control implementations-examples of Weighing machine and Binary multiplier.

TEXT BOOKS:

1. Switching and Logic design – CVS Rao, Pearson, 2005.
2. Switching & Finite Automata theory – Zvi Kohavi, TMH, 2nd Edition.

REFERENCES:

1. Introduction to Switching Theory and Logic Design - F.J.Hill, G.R.Peterson, John Wiley, 2nd edition.
2. Switching Theory and Logic Design – R.P.Jain, TMH Edition, 2003.
3. Digital Design - Morris Mano, PHI, 2nd edition.
4. An Engineering Approach To Digital Design – Fletcher, PHI.
5. Digital Logic – Application and Design – John M. Yarbrough, Thomson Publications, 1997.
6. Fundamentals of Logic Design – Charles H. Roth, Thomson Publications, 5th Edition, 2004.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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II YEAR B.Tech. E.Cont.E - I Semester

T P C
0 3 2**(EE05201) ELECTRICAL TECHNOLOGY LAB****PART - A**

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

PART – B

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

Note: Any **TEN** of the above experiments are to be conducted

(EE05190) 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.

(HS05353) 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, 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 strategies Market structures: Types of competition, Features of Perfect competition, Monopoly and Monopolistic Competition. Price-Output Determination in case of Perfect Competition and Monopoly. Pricing Strategies

Unit V

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. Aiyasri: 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, 2004.
2. Shim & Siegel: Financial Accounting (Schaum's Outlines), 2/e, TMH, 2004
3. Chary: Production and Operations Management, 3/e, TMH, 2004.
4. Domnick Salvatore: Managerial Economics In a Global Economy, 4th Edition, Thomson, 2003.
5. Narayanaswamy: Financial Accounting—A Managerial Perspective, PHI, 2005
6. Peterson & Lewis: Managerial Economics, 4th Edition, Pearson Education, 2004
7. Raghunatha Reddy & Narasimhachary: Managerial Economics & Financial Analysis, Scitech, 2005.
8. S.N.Maheswari & S.K. Maheswari, Financial Accounting, Vikas, 2005.
9. Truet and Truet: Managerial Economics: Analysis, Problems and Cases, Wiley, 2004.
10. Dwivedi: Managerial Economics, 6th Ed., Vikas, 2002
11. Yogesh Maheswari: Managerial Economics, 2nd Ed., PHI, 2005.

II Year B.Tech. E.Cont.E II Semester

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(CE 05239) 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 ecological pyramids. - Introduction, types, characteristic features, structure and function of the following ecosystem:

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

UNIT - IV

Biodiversity and its conservation : Introduction - Definition: genetic, species and ecosystem 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-spots 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 :

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- 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 ecosystems-pond, river, hill slopes, etc.

TEXTBOOK :

- Textbook of Environmental Studies for Undergraduate Courses by Erach Bharucha for University Grants Commission.

II YEAR B.Tech. E.Cont.E - II Semester

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(EN05186) ELECTRICAL & 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 ELECTRICAL 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:

- Electronic Instrumentation & Measurements techniques by W.D. Cooper
- A Course on Electrical and Electronics Measurements by A.K. Sawhney, Dhanpath Rai Publications.

REFERENCES:

- Transducers & display systems by B.S. Sunde(TMh)
- Electronic measurements by Oliver & Cagle(ISE).

(EE05149) CONTROL SYSTEMS**UNIT – I INTRODUCTION**

Concepts of Control Systems- Open Loop and closed loop control systems and their differences- Different examples of control systems- Classification of control systems, Feed-Back Characteristics, Effects of feedback.

Mathematical models – Differential equations, Impulse Response and transfer functions - Translational and Rotational mechanical systems

UNIT II TRANSFER FUNCTION REPRESENTATION

Transfer Function of DC Servo motor - AC Servo motor- Synchro transmitter and Receiver, Block diagram representation of systems considering electrical systems as examples -Block diagram algebra – Representation by Signal flow graph - Reduction using mason's gain formula.

UNIT-III TIME RESPONSE ANALYSIS

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

UNIT – IV STABILITY ANALYSIS IN S-DOMAIN

The concept of stability - Routh stability criterion – qualitative stability and conditional 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 and applications of Nyquist criterion to find the stability – Effects of adding poles and zeros to $G(s)H(s)$ on the shape of the Nyquist diagrams.

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

TEXT BOOKS:

1. Control Systems Engineering – by I. J. Nagrath and M. Gopal, New Age International (P) Limited, Publishers, 2nd edition.
2. Modern Control Engineering – by Katsuhiko Ogata – Prentice Hall of India Pvt. Ltd., 3rd edition, 1998.

REFERENCES:

1. Control Systems by N.K.Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.
2. Automatic Control Systems 8th edition– by B. C. Kuo 2003– John wiley and son's.,
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 Semester

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(EC05497) 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.
2. Wave Generation and Shaping - L. Strauss.
3. Pulse, Digital Circuits and Computer Fundamentals - R. Venkataraman.

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II YEAR B.Tech. E.Cont.E - II Semester

T P C
4+1 0 4**(EN05555) 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 , zero,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 remanance & 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, electrodynamic acceleration transducer, electrostatic pressure transducer etc.

UNIT VIII: THERMAL & RADIATION TRASPDCERS

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 Transducers- An introduction to their performance and design " Oxford University press.
2. E.O Doebelin " Measurements 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. Curtis D.Jhonson "Process control Instrumentation Technology" Jhon wiley & Sons publishers.

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.

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

(CS05140) 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 Microoperations, 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 Coherence. Shared Memory Multiprocessors.

TEXT BOOKS:

1. Computer Systems Architecture – M.Moris Mano, 11rd Edition, PHI/Pearson.
2. Computer Organization – Car Hamacher, Zvonks Vranesic, Safezaky, Vth Edition, McGraw Hill.

REFERENCE:

1. Computer Organization and Architecture – William Stallings Sixth Edition, PHI/Pearson.
2. Structured Computer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson.
3. Fundamentals or Computer Organization and Design, - Sivarama Dandamudi Springer Int. Edition.

(CS05435) OPERATING SYSTEMS

Objectives:

UNIT – I:

Computer System and Operating System Overview; Overview of Computer System hardware – Instruction execution – I/O function – Interrupts – Memory hierarchy – I.O Communication techniques. Operating System Objectives and functions – Evaluation of operating System – Example Systems.

UNIT- II:

Process Description – Process Control-process states – Process and Threads - Examples of Process description and Control.

UNIT - III:

Concurrency: Principles of Concurrency – Mutual Exclusion – Software and hardware approaches – semaphores – Monitors – Message Passing – Readers Writers Problem.

UNIT - IV:

Principles of deadlock – deadlock prevention, detection and avoidance dining philosophers problem – example Systems.

UNIT – V:

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

UNIT – VI:

Uniprocessor Scheduling: Types of Scheduling – Scheduling algorithms – I/O management and Disc Scheduling – I/o devices – organization – of I/O function – OS design issues – I/O buffering – Disk I/O – disk scheduling Policies – examples System.

UNIT – VII:

File Management and Security: Overview of file management – file organization and access – File Directories – File sharing – record blocking – secondary Storage Management – example system.

UNIT – VIII:

Security: Security threats – Protection – intruders – Viruses – trusted System.

TEXT BOOKS:

1. Operating Systems' – Internal and Design Principles, Fifth Edition–2005, Pearson education./PHI
2. Operating System Principles- Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 7th Edition John Wiley

REFERENCES:

1. Operating Systems A design approach- Crowley, TMH.
2. Modern Operating Systems, Andrew S Tanenbaum. 2nd Edition, PHI/PEARSON

(EC05471) 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 Division Multiplexing, Frequency Division 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, Shannon-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.

III YEAR B.Tech. E.Cont.E – I Semester	T P C
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(ME05436) OPERATIONS RESEARCH**UNIT – I**

Development – Definition– Characteristics and Phases – Types of models – operation Research models – applications.

ALLOCATION: Linear Programming Problem Formulation – Graphical solution – Simplex method – Artificial variables techniques -Two–phase method, Big-M method – Duality Principle.

UNIT – II

TRANSPORTATION PROBLEM – Formulation – Optimal solution, unbalanced transportation problem – Degeneracy. Assignment problem – Formulation – Optimal solution - Variants of Assignment Problem- Traveling Salesman problem.

SEQUENCING – Introduction – Flow –Shop sequencing – n jobs through two machines – n jobs through three machines – Job shop sequencing – two jobs through 'm' machines.

UNIT – III

REPLACEMENT: Introduction – Replacement of items that deteriorate with time – when money value is not counted and counted – Replacement of items that fail completely, group replacement.

UNIT – IV

THEORY OF GAMES: Introduction – Minimax (maximin) – Criterion and optimal strategy – Solution of games with saddle points – Rectangular games without saddle points – 2 X 2 games – dominance principle – m X 2 & 2 X n games -graphical method.

UNIT – V

WAITING LINES: Introduction – Single Channel – Poisson arrivals – exponential service times – with infinite population and finite population models– Multichannel – Poisson arrivals – exponential service times with infinite population single channel Poisson arrivals.

UNIT – VI

INVENTORY: Introduction – Single item – Deterministic models – Purchase inventory models with one price break and multiple price breaks – shortages are not allowed – Stochastic models – demand may be discrete variable or continuous variable – Instantaneous production. Instantaneous demand and continuous demand and no set up cost.

UNIT – VII**DYNAMIC PROGRAMMING:**

Introduction – Bellman's Principle of optimality – Applications of dynamic programming- capital budgeting problem – shortest path problem – linear programming problem.

UNIT – VIII

SIMULATION: Definition – Types of simulation models – phases of simulation– applications of simulation – Inventory and Queuing problems – Advantages and Disadvantages – Simulation Languages.

TEXT BOOK:

1. Operations Research / S.D.Sharma-Kedarnath.

REFERENCES:

1. Operations Research /A.M.Natarajan,P.Balasubramani,A. Tamilarasi/Pearson Education.
2. Operations Research: Methods and Problems / Maurice Saseini, Arthur Yaspian and Lawrence Friedman
3. Operations Research / R.Pannerseelvarn,PHI Publications.
4. Operations Research / Wagner/ PHI Publications.
5. Operation Research /J.K.Sharma/MacMillan.
6. Introduction to O.R./Hiller & Liberman (TMH).
7. O.R/Wayne L.Winston/Thomson Brooks/cole
8. Introduction to O.R /Taha/PHI

HYDERABAD

III YEAR B.Tech. E.Cont.E – I Semester

T P C
4+1 0 4**(EC05342) 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.

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. Dalbey, TMH.
3. Design with Operational Amplifiers and Analog Integrated Circuits - Sergio Franco, McGraw Hill, 3rd Ed., 2002.
4. Digital Fundamentals – Floyd and Jain, Pearson Education, 8th Edition, 2005.

HYDERABAD**III YEAR B.Tech. E.Cont.E – I Semester****T P C
4+1 0 4****(EN05478) 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 modes- composite 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 flows- temperature 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 stream 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(Willey 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)

(EC05301) 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

(EE05151) CONTROL SYSTEM LABORATORY –I

(Minimum Ten experiments should be performed)

1. Characteristics of synchro transmitter, Synchro receiver and control transformers
2. gain control of the output of D.C. Amplifier with and without chopper stabilization.
3. Programming a P.L.C
4. Torque- displacement characteristics of stepper motor using A/D converters.
5. Open loop control of a relay servomechanism (On- off control of a temp in a heater bath)
6. Advantage of . feedback on the performance of an open loop speed control system (D.C. Motor speed control system)
7. Response of a first order system, with R.C Components (Simulated transfer function) on X-Y plotter/ Servo scope.
8. Operation of pneumatically operated pressure control system using pressure sensitive bellows and LVDT as sensors.
9. Error comparators- gauged potentiometer and systems potentiometer- sensitivity determination.
10. Calibration of a torque- balance pressure control system using a flapper nozzle in the pressure sensing circuit.
11. Modelling of a distillation column as a lumped parameter multi variable system.
12. Pneumatically operated PID controller, with independent gain control of P,I, and D control loops, of a step input response.

(CS05138) COMPUTER NETWORKS**UNIT –I:**

Introduction: OSI, TCP/IP and other networks models, Examples of Networks: Novell Networks, Arpanet, Internet, Network Topologies WAN, LAN, MAN.

UNIT-II:

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

UNIT-III:

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

UNIT-IV:

Medium Access sub layer: AL OHA, MAC addresses, Carrier sense multiple access, IEEE 802.X Standard Ethernet, wireless LANS. Bridges,

UNIT-V:

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

UNIT –VI:

Dynamic routing – Broadcast routing, Rotary for mobility. Congestion, Control Algorithms – General Principles – of Congestion prevention policies. Internet Working: The Network layer in the Internet and in the ATM Networks.

UNIT –VII:

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

UNIT –VIII :

Application Layer – Network Security, Domain Name System, SNMP, Electronic Mail; the World WEB, Multi Media.

TEXT BOOKS:

1. Computer Networks — Andrew S Tanenbaum, 4th Edition. PHI/Pearson Education.
2. Data Communications and Networking – Behrouz A. Forouzan.. third Edition TMH.

REFERENCES:

1. An Engineering approach to Computer Networks – S. Keshav, 2nd Edition, Pearson Education.
2. Understanding Communications and Networks, W.A.Shay, Thomson

(EC05400) MICROPROCESSORS AND INTERFACING**UNIT I :**

An over view of 8085, Architecture of 8086 Microprocessor: Special functions of General purpose registers: 8086 flag register and function of 8086 Flags.

UNIT II :

Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures, and macros.

UNIT III :

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

UNIT IV :

Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM and EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257.

UNIT V

8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, Stepper Motor and actuators. D/A and A/D converter interfacing.

UNIT VI

Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts: 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance.

UNIT VII

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

UNIT VIII

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

TEXT BOOKS:

1. Advanced microprocessor and Peripherals - A.K.Ray and K.M.Bhurchandi, TMH, 2000.
2. Microprocessors and interfacing - Douglas V. Hall, TMH, 2nd Edition, 1999.

REFERENCES

1. Micro computer systems, The 8086/8088 Family Architecture, Programming and Design - Y.Liu and G.A. Gibson, PHI, 2nd edition.
2. Microprocessors 8086/ 8088 - Avatar Singh and Triebel, PHI.
3. Assembly Language Techniques for the IBM PC - Alan R, Miller, BPB. (for DOS and BIOS interrupts only)
4. Micro Controllers - Rajkamal, Pearson Education, 2005.
5. Design with PIC Micro Controllers – John B. Peatman, 2005.
6. 8051 Micro Controllers – Dr. Rajiv Kapadia.
7. 8086 Micro Processor - Kenneth J. Ayala, Penram International/ Thomson, 1995.
8. 8051 Microcontroller - Kenneth J. Ayala, Penram International/ Thomson, 3rd Edition, 2005.

(EC05176) 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.

UNIT III**FAST FOURIER TRANSFORMS**

Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency, FFT Algorithms, Inverse FFT, FFT with General Radix.

UNIT IV**REALIZATION OF DIGITAL FILTERS**

Applications of z-transforms, solution of difference equations of digital filters. System function, stability criterion, frequency response of stable systems. Realization of digital filters – direct, canonic, cascade and parallel forms, Lattice structures.

UNIT V**IIR DIGITAL FILTERS**

Analog filter approximations – Butter worth and Chebyshev, Design of IIR Digital filters from analog filters, Bilinear transformation method, step and impulse invariance techniques, Spectral 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, filter design and implementation for 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.

Examples: Features of TMS 320CXX Processors, Internal Architecture. External memory accesses, Pipeline operations, Peripherals.

TEXT BOOKS:

1. Digital Signal Processing : Principals, Algorithms and Applications - Proakis, J.Gard and D.G.Manolakis, 3rd Edn.,PHI, 1996.
2. Fundamentals of Digital Signal Processing – Robert J. Schilling and Sandra L. Harris, Thomson, 2005.

REFERENCES

1. Discrete Time Signal Processing – A.V. Oppenheim and R.W. Schaffer, PHI, 1989.
 2. Fundamentals of Digital Signal Processing – Loney Luderman.
 3. Digital Signal Processing – S. Salivahanan et al., TMH, 2000.
 4. Digital Signal Processing – Thomas J. Cavicchi, WSE, John Wiley, 2004.
- Digital Signal Processors, Architecture, Programming & Applications, - B. Venkata Ramani, M. Bhaskar, TMH, 4th reprint, 2004.

(HS05352) MANAGEMENT SCIENCE

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

Unit VIII :

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

Unit I : **Introduction to Management:** Concepts of Management and

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

Unit II :

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

Unit III :

Operations Management: Principles and Types of Plant Layout- Methods of production (Job, batch and Mass Production), Work Study -Basic procedure involved in Method Study and Work Measurement- Statistical Quality Control: 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.
b) Marketing: Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

Unit IV :

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 :

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TEXT BOOKS:

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

REFERENCES:

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz & Wehrich: Essentials of Management, 6/e, TMH, 2005
3. Thomas N.Duening & John M.Ivancevich Management—Principles and Guidelines, Biztantra,2003.
4. Kanishka Bedi, Production and Operations Management, Oxford University Press, 2004.
5. Memoria & S.V.Gauker, Personnel Management, Himalaya, 25/e, 2005
6. Samuel C.Certo: Modern Management, 9/e, PHI, 2005
7. Schermerhorn, Capling, Poole & Wiesner: Management, Wiley, 2002.
8. Parnell: Strategic Management, Biztantra,2003.
9. Lawrence R Jauch, R.Gupta &William F.Glueck:Business Policy and Strategic Management, Frank Bros.2005.
10. L.S.Srinath: PERT/CPM,Affiliated East-West Press, 2005.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III YEAR B.Tech. E.Cont.E - II Semester

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(ME05508) ROBOTICS AND AUTOMATION

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, Manipulator Dynamic and Force Control, Electronic and Pneumatic manipulators.

UNIT – IV ACTUATORS AND GRIPPERS

Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effector, 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, CSP Rao and V.V. Reddy, Pearson Publications (In press)
2. Robotics and Control / Mittal R K & Nagrath I J / TMH.
3. An Introduction to Robot Technology, / P. Coiffet and M. Chaitronze / Kogam Page Ltd. 1983 London.
4. Robotic Engineering / Richard D. Klatter, Prentice Hall
5. Robot Analysis and Intelligence / Asada and Slow time / Wiley Inter-Science
6. Introduction to Robotics / John J Craig / Pearson Edu.
7. Robot Dynamics and Control by Mark W. Spong and M. Vidyasagar, John Wiley & Sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III YEAR B.Tech. E.Cont.E - II Semester

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(EE05006) ADVANCED 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 Lyapunov's instability theorems. Direct method of Lyapunov for the Linear and Nonlinear continuous time autonomous systems.

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 Engineering – by K. Ogata, Prentice Hall of India, 3rd edition, 1998
2. Systems and Control by Stainslaw H. Zak , Oxford Press, 2003.

REFERENCES:

1. Control Systems Engineering by I.J. Nagarith and M.Gopal, New Age International (P) Ltd.
2. Digital Control and State Variable Methods – by M. Gopal, Tata Mc Graw-Hill Companies, 1997.
3. Control Systems Engineering by S.N.Sivanandam-Vikas Publishing House.
4. Modern Control System Theory – by M. Gopal, New Age International Publishers, 2nd edition, 1996

(EC05401) MICROPROCESSORS LAB**I. Microprocessor 8086**

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

II. Interfacing

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

III. Microcontroller 8051

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

(EC05152) CONTROL SYSTEMS LABORATORY- II

(Minimum Ten experiments should be performed)

1. Determination of the control characteristics of A.C servomotor.
2. Transfer function of armature controlled D.C servomotor with inertia and viscous forces
3. Control characteristic of a magnetic amplifier with and without feedback.
4. D.C Motor speed control with regenerative and degenerative feedback and with tach generator in the feedback path.
5. D.C position control system –Output control with variation of control loop gain
6. System identification for the frequency response of a filter (band pass + band elimination filter)
7. Shaft angle encoder, decoder, output characteristics.
8. Amplitude modulation of low frequency, Signal and recovery after demodulation (effect of modulating frequency on the signal to noise ratio).
9. Robot manipulator motion control using feed pendent.
10. Pick and plan assignment of robot manipulator with microcontroller.
11. 4-1 line multiplexer with digital logic gates.
12. Elementary fast programming on a robot manipulator (describing a trajectory, which is predefined).

(CS05434) OOPS THROUGH JAVA**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.

IV YEAR B.Tech. E.Cont.E - I Semester

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(EE05425) NEURAL NETWORKS & FUZZY LOGIC

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 BOOKS:

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Artificial Neural Systems - Jacek M. Zurada, Jaico Publishing House, 1997.

REFERENCES:

1. Neural and Fuzzy Systems: Foundation, Architectures and Applications, - N. Yadaiah and S. Bapi Raju, Pearson Education
2. Neural Networks – James A Freeman and Davis Skapura, Pearson, 2002.
3. Neural Networks – Simon Hykins , Pearson Education
4. Neural Engineering by C.Eliasmith and CH.Anderson, PHI
5. Neural Networks and Fuzzy Logic System by Bork Kosk, PHI Publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

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IV YEAR B.Tech. E.Cont.E - I Semester

T P C
4+1 0 4**(EC05170) 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 stability 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.

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
2. Digital Control and State Variable Methods by M.Gopal, TMH

REFERENCES:

1. Digital Control Systems, Kuo, Oxford University Press, 2nd Edition, 2003.
2. Digital Control Engineering, M.Gopal

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IV YEAR B.Tech. E.Cont.E - I Semester

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(IC05001) 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(STRF), 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 Mishkin and Braun – McGraw Hill
2. Digital control systems by P.N.Paraskevopoulos Prentice Hall.

(EN05504) RELIABILITY AND SAFETY ENGINEERING

(ELECTIVE - I)

UNIT – I BASICS OF PROBABILITY THEORY AND DISTRIBUTIONS

Basic Probability theory – Binomial, Poisson, Exponential and Weibull distributions.

UNIT – II NETWORK MODELLING AND RELIABILITY ANALYSIS

Analysis of series, Parallel, Series – Parallel networks, fully redundant and Partially redundant systems (K – out – of m) systems – use and types of redundancy and system reliability improvement methods

UNIT – III RELIABILITY FUNCTIONSReliability functions $f(t)$, $F(t)$, $h(t)$, $R(t)$ and their relationships, Expected value and Standard Deviation of exponential distribution – Bath Tub Curve – Reliability measures MTTF, MTTR, MTBF.**UNIT – IV MARKOV MODELLING**

Markov Concepts – Markov chains – Concept of stochastic transitional probability matrix. Evaluation of limiting state probabilities – Markov processes – one component repairable systems – Time dependent probability evaluation – Evaluation of limiting state probabilities.

UNIT – V MAINTAINABILITY - BASIC CONCEPTS

Definition, Basic concepts, Relationship between Reliability, Maintainability, Availability – corrective maintenance time distributions – Maintainability distributions.

UNIT – VI MAINTAINABILITY MEASURES

Objectives, types of maintenance – Preventive, condition – based and reliability centered maintenance – Terotechnology, total productive maintenance (TPM)

UNIT – VII MAINTAINABILITY – DESIGN ASPECTS

Design considerations for maintainability – Introduction to Life testing, Estimation of parameters for exponential and Weibull distributions.

UNIT – VIII SAFETY

Causes of failure and reliability, Human reliability and operator training, Origins of Consumerism and importance of product knowledge, product safety, product reliability and product safety improvement program.

TEXT BOOKS:

1. Reliability Engineering, E. Balagurusamy
2. An introduction to Reliability and Maintainability Engineering, Charles E. Ebeling, Tata McGraw Hill Edition.

REFERENCES:

1. Maintainability, B.S.Blanchard
2. Introduction to Reliability Engineering by Sinha and Kale, Wiley Eastern.

(CS05159) DATABASE MANAGEMENT SYSTEMS

(ELECTIVE-I)

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.

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IV YEAR B.Tech. E.Cont.E - I Semester

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(EC05574) VLSI DESIGN

(ELECTIVE-I)

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 – recovering 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 – Extendible vs. Linear 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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IV YEAR B.Tech. E.Cont.E - I Semester

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(EC05574) VLSI DESIGN

(ELECTIVE-I)

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: $I_{ds} - V_{ds}$ relationships, MOS transistor threshold Voltage, gm, gds, figure of merit μ_0 ; 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 I_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 R_s and its concept to MOS, Area Capacitance Units, Calculations - t - 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, Chip-level Test Techniques, System-level Test Techniques, Layout Design for improved Testability.

TEXT BOOKS:

1. Essentials of VLSI circuits and systems – Kamran Eshraghian, Eshraghian Douglas 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.

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IV YEAR B.Tech. E.Cont.E - I Semester

T P C
4+1 0 4**(EN05179) DISTRIBUTED COMPUTER CONTROL SYSTEMS**

(ELECTIVE II)

UNIT I

Architecture computer control systems – controlled architecture –Distributed control architecture Data highway system.

UNIT II

Distributed computing system: Distributed processing . Digital control system-digital control system – computer control, self tuning and adaptive algorithms .

UNIT III

Supervising control systems, Multi layer hierarchical structure , system decomposition , open loop co-ordination strategies, model reality differences, closed loop co-ordinate strategies

UNIT IV

Integrated system, Optimization an parameter estimation(SOPE) , Double interactive strategies

UNIT V

Real time control systems: Design techniques and tools – MASCOT , structured development of real time system.

UNIT VI

Fault tolerance in mixed hardware – software system- Fault detection measures- fault detection mechanism – Damage confinement and assessment.

UNIT VII

Expert system in real time control- Knowledge based process management , Representation of knowledge , reasoning in real time , application of knowledge based systems for process management .

UNIT VIII

Real time task management , Task scheduling dispatch , Task co- operations and Communications , distributed data, distributed control

TEXT BOOK:

1. Distributed Computer Control systems by SS Lamba, Y D Singh. TMH publications new Delhi

REFERNECE BOOK: NIL

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IV YEAR B.Tech. E.Cont.E - I Semester

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(ME05427) NON-CONVENTIONAL SOURCES OF ENERGY

(ELECTIVE-II)

UNIT – I

PRINCIPLES OF SOLAR RADIATION: Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT-II

SOLAR ENERGY COLLECTION: Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.

UNIT-III

SOLAR ENERGY STORAGE AND APPLICATIONS: Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT-IV

WIND ENERGY: Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria

UNIT-V

BIO-MASS: Principles of Bio-Conversion, Anaerobic/aerobic digestion, types of Bio-gas digesters, gas yield, combustion characteristics of bio-gas, utilization for cooking, I.C.Engine operation and economic aspects.

UNIT-VI

GEOTHERMAL ENERGY: Resources, types of wells, methods of harnessing the energy, potential in India.

UNIT-VII

OCEAN ENERGY: OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

UNIT-VIII

DIRECT ENERGY CONVERSION: Need for DEC, Carnot cycle, limitations, principles of DEC. Thermo-electric generators, seebeck, peltier and joule Thomson effects, Figure of merit, materials, applications, MHD generators, principles, dissociation and ionization, hall effect, magnetic flux, MHD accelerator, MHD Engine, power generation systems, electron gas dynamic conversion, economic aspects. Fuel cells, principles, faraday's law's, thermodynamic aspects, selection of fuels and operating conditions.

TEXT BOOKS:

1. Renewable energy resources/ Tiwari and Ghosal/ Narosa.
2. Non-Conventional Energy Sources /G.D. Rai

REFERENCES:

1. Renewable Energy Sources /Twidell & Weir
2. Solar Energy /Sukhame
3. Spilar Power Engineering / B.S Magal Frank Kreith & J.F Kreith
4. Principles of Solar Energy/Frank Krieth & John F Kreider
5. Non-Conventional Energy / Ashok V Desai /Wiley Eastern.
6. Non-Conventional Energy Systems / K Mittal /Wheeler
7. Renewable Energy Technologies /Ramesh & Kumar /Narosa

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IV YEAR B.Tech. E.Cont.E - I Semester

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(CS05216) EMBEDDED SYSTEMS

(ELECTIVE-II)

UNIT I

Embedded Computing: Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples.

UNIT II

The 8051 Architecture : Introduction, 8051 Micro controller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts.

Unit III

Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions.

Unit IV

Arithmetic Operations, Decimal Arithmetic: Jump and Call Instructions, Further Details on Interrupts.

Unit-V

Applications: Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication.

Unit VI

Introduction to Real – Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores, and Shared Data: Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment

Unit VII

Basic Design Using a Real-Time Operating System: Principles, Semaphores and Queues, Hard Real-Time Scheduling Considerations, Saving Memory and Power, An example RTOS like uC-OS (Open Source); Embedded Software Development Tools: Host and Target machines, Linker/Locators for Embedded Software, Getting Embedded Software into the Target System; Debugging Techniques: Testing on Host Machine, Using Laboratory Tools, An Example System.

Unit VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I²C bus and CAN bus; Internet-Enabled Systems, Design Example- Elevator Controller.

TEXT BOOKS:

1. Computers and Components, Wayne Wolf, Elseveir.
2. The 8051 Microcontroller, Third Edition, Kenneth J Ayala, Thomson.

REFERENCES:

1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukhi, TMH.
4. Embedded System Design, Frank Vahid, Tony Givargis, John Wiley.
5. Microcontrollers, Raj kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

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

(EE05153) CONTROL SYSTEMS LABORATORY- III

(Minimum ten experiments should be performed)

1. plot bode plot measurements frequency domain plots for selected transferfunction with MAT LAB- Nyquist of gain and phase margins
2. plotting root locus for selected transfer function using MATLAB.
3. step function response of a second order system on MATLAB- Control of transient and steady state parameters
4. obtaining state – space model for a classical transfer function using MATLAB
5. pole placement for dead beat response of the chosen system(from the state – space model), using MATLAB and state feedback
6. Design of phases lead compensator and phase lag components for the Bode plot
7. transfer function of a sample and zero order hold circuit
8. design a dead beat digital controller for step input for a chosen 2nd order system
9. model reference adaptor control system, with parameter optimization for a position control system
10. design of a full order digital observer for the chosen state – space model using state space approach and compute simulation for a chosen system
11. programming a microprocessor(real time control; for a computer controlled temperature control system for a heater bath)
12. a pc based digital controller for a position control system for prescribed specification

(CS05308) 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.

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IV YEAR B.Tech. E.Cont.E - II Semester

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4+1 0 4**(CS05048) ARTIFICIAL INTELLIGENCE**

(ELECTIVE – III)

UNIT VI**DIAC, TRIAC AND THYRISTOR APPLICATIONS:**

Chopper circuits – Principle, methods and Configurations, Diac and Triac, Tracs – 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 welding, 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

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.
Constraint satisfaction problems: Backtracking search for CSPs local search for constraint satisfaction problems.

UNIT-IV

Game Playing: Adversarial 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 propositional 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).

(EN05544) TELEMETRY & 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

FDMA, 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 Sub-systems, Telemetry and Communications.

UNIT – VI: OPTICAL TELEMETRY

Optical fibers Cable – Sources and detectors – Transmitter and Receiving Circuits, Coherent Optical Fiber Communication System.

UNIT – VII & VIII: TELECONTROL METHODS

Analog and Digital techniques in Telecontrol, Telecontrol apparatus – Remote adjustment, Guidance and regulation – Telecontrol using information theory – Example of a 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.

(CS05521) SOFTWARE ENGINEERING

(ELECTIVE – III)

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, McGraw-Hill 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

IV YEAR B.Tech. E.Cont. E - II Semester

T P C
4 +1 0 4**(EI05351) 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. Effic 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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IV YEAR B.Tech. E.Cont.E - II Semester

T P C
4 +1 0 4**(EN05136) COMPUTER AIDED DESIGN OF CONTROL SYSTEMS**

(Elective – IV)

UNIT I: INTRODUCTION

Introduction and mathematical back ground, system models, Generation of system matrices-Least order, Decoupling zeros, mode of the system transformation – McMillian form – Reduction to least order

UNIT II: CONTROLLABILITY AND OBSERVABILITY

Concepts of controllability and observability, Controllability and observability - Decomposition of state space and Duality.

UNIT III: STABILITY ANALYSIS OF SISO SYSTEMS

System Specification, Stability- Decoupling zeros , Nyquist Diagram. Inverse Nyquist diagram-

UNIT IV: DESIGN OF COMPENSATORS

Design of phase lead compensators from inverse Nyquist diagram- Design of phase lag compensators from inverse Nyquist diagram.

UNIT V: DESIGN CRITERIA

Design using Root loci method of design, Comparison with inverse Nyquist diagram techniques – Sensitivity Design criteria , step response – frequency response – pole location – Selection of criteria. Irrational transfer functions, Non minimum phase response . the circle criteria – Connection with the describing function.

UNIT VI: MULTIVARIABLE SYSTEMS

Notation, Gain space, stability, frequency response criteria for stability, diagonal dominance, Ostrowski's theorem, Achieving dominance, Sensitivity, Direct Nyquist array, design procedure- Multi variable circle criterion.

UNIT VII: MATLAB PROGRAMMING

Introduction, variables, Expressions, Control statements, Logical & Relational operators, Function files, Script files, Input-Output format, Working with Workspace

UNIT VIII: DESIGN OF CONTROLLERS USING MATLAB

Introduction to Control system Tool Box, Time and Frequency domain analysis of Control Systems using MATLAB, Stability analysis using MATLAB, Controllability and Observability testing using MATLAB, Design of static Feed back Controllers.

TEXT BOOKS:

1. Computer Aided Design of Control Systems – by Resenbrock(Academic Press)
2. Multi variable Control Theory by Y.S. Apte.

REFERENCES:

1. MATLAB Control System Tool Box.
2. Simulation Tools for Electrical Engineers – by N. Yadaiah and G. Tulasi Ram Das, Pearson Education.

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IV YEAR B.Tech. E.Cont.E - II Semester

T P C
4 +1 0 4

(EC05582) WIRELESS COMMUNICATIONS 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 band 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 Communication and Networking – William Stallings, PHI, 2003.
2. Wireless Communications, Principles, Practice – Theodore, S. Rappaport, PHI, 2nd Edn., 2002.

REFERENCES

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