ACADEMIC REGULATIONS COURSE STRUCTURE AND DETAILED SYLLABUS

ELECTRICAL & ELECTRONICS ENGINEERING

for

B.TECH. FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2005-2006)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KUKATPALLY, HYDERABAD - 500 072 (A.P.)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

B.TECH. ELECTRICAL & ELECTRONICS ENGINEERING

I Year

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
HS 05231	English	2 + 1*	-	4
MA 05363	Mathematics – I	3 + 1*	-	6
PY 05047	Applied Physics	2 + 1*	-	4
MA 05361	Mathematical Methods	3 + 1*	-	6
CS 05106	C Programming and Data Structures	3 + 1*	-	6
EE 05189	Electrical Circuits	2 + 2*	-	4
EC 05210	Electronic Devices & Circuits	3 + 1*	-	6
ME 05220	Engineering Drawing Practice Lab.	-	3	4
CS 05144	Computer Programming Lab	-	3	4
EC 05211	Electronic Devices and Circuits Lab	-	3	4
ME 05230	Engineering Workshop Practice	-	3	4
HS 05232	English Language Communication Skills Lab	-	3	4
	Total	**26**	**15**	**56**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD.

B.TECH. ELECTRICAL & ELECTRONICS ENGINEERING

II Year **I Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
MA 05365	Mathematics-III	4+1*	-	4
CE 05256	Fluid Mechanics & Hydraulic Machinery	4+1*	-	4
EC 05497	Pulse and Digital Circuits	4+1*	-	4
EE 05539	Switching Theory and Logic Design	4+1*	-	4
EE 05205	Electromagnetic Fields	4+1*	-	4
EE 05193	Electrical Machines – I	4+1*	-	4
CE 05257	Fluid Mechanics & Hydraulic Machinery Lab	-	3	2
EE 05190	Electrical Circuits Lab	-	3	2
	Total	**30**	**6**	**28**

II YEAR **II Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
HS 05353	Managerial Economics & Financial Analysis	4+1*	-	4
CE 05239	Environmental Studies	4+1*	-	4
EC 05342	Linear and Digital IC Applications	4+1*	-	4
EE 05467	Power Systems – I	4+1*	-	4
EE 05194	Electrical Machines – II	4+1*	-	4
EE 05149	Control Systems	4+1*	-	4
EC 05300	I.C and Pulse & Digital Circuits Lab	-	3	2
EE 05196	Electrical Machines Lab – I	-	3	2
	Total	**30**	**6**	**28**

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD.

B.TECH. ELECTRICAL & ELECTRONICS ENGINEERING

III Year **I Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
CS 05140	Computer Organization	4+1*	-	4
EE 05198	Electrical Measurements	4+1*	-	4
EE 05468	Power Systems – II	4+1*	-	4
EE 05459	Power Electronics	4+1*	-	4
EE 05195	Electrical Machines – III	4+1*	-	4
EE 05343	Linear and Discrete Systems Analysis	4+1*	-	4
EE 05197	Electrical Machines Lab – II	-	3	2
EE 05150	Control Systems Lab	-	3	2
	Total	**30**	**6**	**28**

III YEAR **II Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
EC 05176	Digital Signal Processing	4+1*	-	4
EE 05404	Microprocessors and Microcontrollers	4+1*	-	4
HS 05352	Management Science	4+1*	-	4
EE 05321	Instrumentation	4+1*	-	4
EE 05538	Switchgear and Protection	4+1*	-	4
EE 05291	High Voltage Engineering	4+1*	-	4
EE 05199	Electrical Measurements Lab	-	3	2
EE 05460	Power Electronics Lab	-	3	2
	Total	**30**	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD.

B.TECH. ELECTRICAL & ELECTRONICS ENGINEERING

IV Year **I Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
EE 05425	Neural Networks & Fuzzy Logic	4+1*	-	4
EE 05464	Power Semiconductor Drives	4+1*	-	4
EE 05465	Power System Analysis	4+1*	-	4
EE 05466	Power System Operation and Control	4+1*	-	4
	ELECTIVE – I	4+1*	-	4
EE 05006	Advanced Control Systems			
ME 05427	Non-Conventional Sources of Energy			
EC 05574	VLSI Design			
	ELECTIVE – II	4+1*	-	4
EE 05505	Reliability Engineering and Application to Power Systems			
EE 05439	Optimization Techniques			
EE 05191	Electrical Distribution Systems			
EE 05405	Microprocessors & Microcontrollers Lab	-	3	2
EE 05520	Simulation of Electrical Systems Lab	-	3	2
	Total	**30**	**6**	**28**

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD.

B.TECH. ELECTRICAL & ELECTRONICS ENGINEERING

IV Year **II Semester**

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
EE 05568	Utilization of Electrical Energy	4+1*	-	4
	ELECTIVE – III	4+1*	-	4
EC 05170	Digital Control Systems			
EE 05282	H.V.D.C. Transmission			
CS 05216	Embedded Systems			
	ELECTIVE – IV	4+1*	-	4
CS 05521	Software Engineering			
CS 05159	Data Base Management Systems			
CS 05434	OOPS through JAVA			
CA 05315	Industry Oriented Mini Project	-	-	2
CA 05515	Seminar	-	-	2
CA 05495	Project Work	-	-	12
	Total	**15**	**-**	**28**

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

* - Tutorial
T - Theory
P - Practical
C - Credits

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

	T	P	C
I Year B.Tech. EEE	**2+1**	**0**	**4**

(HS 05231) ENGLISH

1. INTRODUCTION :

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks, 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 :

1. To promote the language proficiency of the students with emphasis on improving their LSRW skills.
2. To impart training to the students through the syllabus and its theoretical and practical components.
3. 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**

2005-2006

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
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 :

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

REFERENCES :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. EEE

T	P	C
3+1	0	6

(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 Bathul, 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, Sankaraiah, VGS Book Links, Hyderabad.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE

T	P	C
2+1	0	4

(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 & X-RAY 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 - Davisson 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.

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

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.

TEXT BOOKS :

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.Arumugam; 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; Vijayam 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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. EEE **T P C**

3+1 0 6

(MA 05361) MATHEMATICAL METHODS

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 Decomposotion- 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 – Diagonolization 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.Iyengar, 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, 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. Advanced Engineering Mathematics, Merle C.Potter, J.L.Goldberg, E.F.Abrufadel, Oxford University Press. Third Edition 2005.
6. Numerical Methods: V N Vedamurthy , Iyengar N Ch N Vikas pub. Reprint 2005
7. Numerical Methods: S.Arumugam & 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, Sankaraiah, VGS Book Links, Hyderabad.
11. Numerical Methods for Scientific and Engineering Computation: M.K.Jain, S.R.K. Iyengar, R.K.Jain, New Age International (P) Ltd.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE

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 pasing,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, PHI/Pearson education
3. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE

T	P	C
2+2	0	4

(EE 05189) E LECTRICAL 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 Tieset 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. 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.

3. Electric Circuit theory by K. Rajeswaran, Pearson Education,2004.

4. "Circuits" by Carlson, Thomson Publishers.

5. Network Analysis: - C.K. Mithal, Khanna Publishers.

6. Electric Circuits by A. Chakrabarthy, Dhanipat Rai & Sons.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. EEE

T	P	C
3+1	0	6

(EC 05210) 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 VI characteristic, Transition and Diffusion capacitances, Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Characteristics of Tunnel Diode, Varactar 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_{τ}.

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.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. EEE

T	P	C
0	3	4

(ME 05220) 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 By K.L. Narayana & P.Kannayya
2. Engineering drawings By N.D.Bhatt

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE

T	P	C
0	3	4

(CS 05144) COMPUTER PROGRAMMING LAB

1. Write a C program to evaluates the following algebraic expressions after reading necessary values from the user:

   a) ax+b/ax-b

   b) 2.5 log x + cos 32° + | $x^2 - y^2$ | + $\sqrt{2}$ xy

   c) $1/\alpha\sqrt{2}\pi e^{-(x-m/\sqrt{2}\sigma)^2}$

2. Write a C program for the following

   a) Printing three given integers in ascending order

   b) Sum of 1 + 2+ 3 + _ _ _ _ _ n

   c) 1 + $x^2/2!$ + $x^2/4!$+ _ _ _ _ _ upto ten terms

   d) x +$x^3/3!$ + $x^5/5!$+ _ _ _ _ _ upto 7^{th} digit accuracy

   e) Read x and compute Y =1 for x > 0

      Y= 0 for x = 0

      Y= -1 for x<0

3. Write C program using FOR statement to find the following from a given set of 20 integers.

   i) Total number of even integers. ii) Total number of odd integers.

   iii) Sum of all even integers. iv) Sum of all odd integers.

4. 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.

5. 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 %).

6. 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.

7. The total distance traveled by vehicle in 't' seconds is given by distance = ut+1/2at^2 where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance 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'.

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

Purchase Amount	Discount (Percentage)	
	Mill Cloth	Handloom items
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.

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

10. 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 C program using d0-while to calculate and print the first m fibonacci numbers.

11. Write C programs to print the following outputs using for loop.

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

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

12. 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.

13. 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 covert 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.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I YEAR B.Tech. EEE **T P C**
0 3 4

(EC 05211) ELECTRONIC DEVICES AND CIRCUITS LAB

PART A : (Only for viva voce Examination)

ELECTRONIC WORKSHOP PRACTICE (in 6 lab sessions) :

1. Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.
2. Identification, Specifications and Testing of Active Devices, Diodes, BJTs, Lowpower JFETs, MOSFETs, Power Transistors, LEDs, LCDs, Optoelectronic Devices, SCR, UJT, DIACs, TRIACs, Linear and Digital ICs.
3. Soldering practice – Simple Circuits using active and passive components.
4. Single layer and Multi layer PCBs (Identification and Utility).
5. Study and operation of
   - Multimeters (Analog and Digital)
   - Function Generator
   - Regulated Power Supplies
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. Colpitts Oscillator.
19. SCR characteristics.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE — **T P C** — **0 3 4**

(ME 05230) ENGINEERING WORKSHOP PRACTICE

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.

2. 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 BOOK :

1. Work shop Manual / P.Kannaiah/ K.L.Narayana/ Scitech Publishers.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

I Year B.Tech. EEE — **T P C** — **0 3 4**

(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 Kindersley 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, Blakie 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(MA 05365) MATHEMATICS – III

UNIT – I

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

UNIT-II

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

UNIT- III

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

UNIT-IV

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

UNIT-V

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

UNIT-VI

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

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

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

UNIT – VII

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

UNIT-VIII

Conformal mapping : Transformation by e^z, lnz, z^2, z^n (n positive integer), Sin z, cos z, z + a/ zTranslation, 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.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–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, Sankaraiah, VGS Book Links, Hyderabad.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(CE 05256) FLUID MECHANICS AND HYDRAULIC MACHINERY

UNIT I

Fluid statics : Dimensions and units: physical properties of fluids- specific gravity, viscosity surface tension- vapor pressure and their influence on fluid motion- atmospheric gauge and vacuum pressure – measurement of pressure- Piezometer, U-tube and differential manometers.

UNIT II

Fluid kinematics : Stream line, path line and streak lines and stream tube, classification of flows-steady & unsteady, uniform, non uniform, laminar, turbulent, rotational, and irrotational flows-equation of continuity for one dimensional flow.

Fluid dynamics : Surface and body forces –Euler's and Bernoulli's equations for flow along a stream line, momentum equation and its application on force on pipe bend.

UNIT III

Closed conduit flow: Reynold's experiment- Darcy Weisbach equation- Minor losses in pipes- pipes in series and pipes in parallel- total energy line-hydraulic gradient line.

Measurement of flow: pilot tube, venturimeter, and orifice meter, Flow nozzle, Turbine flow meter (Ref.4)

UNIT IV

Basics of turbo machinery : Hydrodynamic force of jets on stationary and moving flat, inclined, and curved vanes, jet striking centrally and at tip, velocity diagrams, work don and efficiency, flow over radial vanes.

UNIT V

Hydroelectric power stations : Elements of hydro electric power station-types-concept of pumped storage plants-storage requirements, mass curve (explanation only) estimation of power developed from a given catchment area; heads and efficiencies.

UNIT VI

Hydraulic Turbines : Classification of turbines, impulse and reaction turbines, Pelton wheel, Francis turbine and Kaplan turbine-working proportions, work done, efficiencies , hydraulic design –draft tube-theory- functions and efficiency.

UNIT VII

Performance of hydraulic turbines : Geometric similarity, Unit and specific quantities, characteristic curves, governing of turbines, selection of type of turbine, cavitation, surge tank, water hammer.

UNIT VIII

Centrifugal pumps : Classification, working, work done – manomertic head- losses and efficiencies-specific speed- pumps in series and parallel-performance characteristic curves, NPSH.

Reciprocating pumps : Working, Discharge, slip, indicator diagrams.

TEXT BOOKS :

1. Hydraulics, fluid mechanics and Hydraulic machinery MODI and SETH.
2. Fluid Mechanics and Hydraulic Machines by Rajput.

REFERENCES :

1. Fluid Mechanics and Fluid Power Engineering by D.S. Kumar, Kotaria & Sons.
2. Fluid Mechanics and Machinery by D. Rama Durgaiah, New Age International.
3. Hydraulic Machines by Banga & Sharma, Khanna Publishers.
4. Instrumentation for Engineering Measurements by James W. Dally, William E. Riley ,John Wiley & Sons Inc. 2004 (Chapter 12 – Fluid Flow Measurements).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EC 05497) 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05539) SWITCHING THEORY AND LOGIC DESIGN

UNIT I

NUMBER SYSTEMS & CODES : Philosophy of number systems – complement representation of negative numbers-binary arithmetic-binary codes-error detecting & error correcting codes –hamming codes.

UNIT II

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

UNIT III

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

UNIT IV

COMBINATIONAL LOGIC DESIGN

Design using conventional logic gates, Encoder, Decoder, Multiplexer, De-Multiplexer, Modular design using IC chips, MUX Realization of switching functions Parity bit generator, Code-converters, Hazards and hazard free realizations.

UNIT V

PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC : Basic PLD's-ROM, PROM, PLA, PLD Realization of Switching functions using PLD's. Capabilities and limitations of Threshold gate, Synthesis of Threshold functions, Multigate Synthesis.

UNIT VI

SEQUENTIAL CIRCUITS - I : Classification of sequential circuits (Synchronous, Asynchronous, Pulse mode, Level mode with examples) Basic flip-flops-Triggering and excitation tables. Steps in synchronous sequential circuit design. Design of modulo-N Ring & Shift counters, Serial binary adder,sequence detector.

UNIT VII

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

UNIT VIII

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

TEXTBOOKS :

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

REFERENCES :

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

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05205) 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 – Guass's law – Application of Guass's Law – Maxwell's first law, div (D)=ρv – Laplace's and Poison'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, div(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, Curl (H) = Jc.

UNIT – VI

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

UNIT – VII

Magnetic Potential : Scalar Magnetic potential and its limitations – vector magnetic potential and its properties – vector magnetic potential due to simple configurations – vector Poisson's equations.
Self and Mutual inductance – Neumans's formulae – determination of self-inductance of a solenoid and toroid and mutual inductance between a straight long wire and a square loop wire in the same plane – energy stored and density in a magnetic field. Introduction to permanent magnets, their characteristics and applications.

UNIT – VIII

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

TEXT BOOKS :

1. "Engineering Electromagnetics" by William H. Hayt & John. A. Buck Mc. Graw-Hill Companies, 7th Editon.2005.
2. "Introduction to Electromagnetics" by CR Paul and S.A. Nasar, Mc-Graw Hill Publications.

REFERENCES :

1. " Engineering Electromagnetics" by Nathan Ida, Springer(India) Pvt. Ltd. 2nd Edition.
2. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt.Ltd, 2nd editon.
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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – I Semester **T P C**
4+1 0 4

(EE 05193) ELECTRICAL MACHINES - I

UNIT – I

Electromechanical Energy Conversion : Electromechanical Energy conversion – forces and torque in magnetic field systems – energy balance – energy and force in a singly excited magnetic field system, determination of magnetic force - co-energy – multi excited magnetic field systems.

UNIT – II

D.C. Generators – Construction & Operation : D.C. Generators – Principle of operation – Action of commutator – constructional features – armature windings – lap and wave windings – simplex and multiplex windings – use of laminated armature – E. M.F Equation – Problems

UNIT – III

Armature reaction in D.C. Generator : Armature reaction – Cross magnetizing and de-magnetizing AT/pole – compensating winding – commutation – reactance voltage – methods of improving commutation.

UNIT – IV

Types of D.C Generators : Methods of Excitation – separately excited and self excited generators – build-up of E.M.F - critical field resistance and critical speed - causes for failure to self excite and remedial measures.

UNIT – V

Load Characteristics of Generators : Load characteristics of shunt, series and compound generators – parallel operation of d.c series generators – use of equalizer bar and cross connection of field windings – load sharing.

UNIT – VI

D.C. Motors : D.C Motors – Principle of operation – Back E.M.F. - Torque equation – characteristics and application of shunt, series and compound motors – Armature reaction and commutation.

UNIT – VII

Speed control of D.C. Motors : Speed control of d.c. Motors: Armature voltage and field flux control methods. Ward-Leonard system.

Motor starters (3 point and 4 point starters) – protective devices –Principles of Solid state Starters.

UNIT – VIII

Testing of D.C. Machines : Testing of d.c. machines: Losses – Constant & Variable losses – calculation of efficiency – condition for maximum efficiency.

Methods of Testing – direct, indirect and regenerative testing – brake test – Swinburne's test – Hopkinson's test – Field's test – Retardation test – separation of stray losses in a d.c. motor test.

TEXT BOOKS :

1. Electric Machines by I.J. Nagrath & D.P. Kothari, Tata Mc Graw – Hill Publishers, 3rd edition, 2004.
2. Electromechanics – I (D.C. Machines) S. Kamakshaiah Right Publishers.

REFERENCES:

1. Performance and Design of D.C Machines – by Clayton & Hancock, BPB Publishers.
2. Electric Machinary-A.E. Fritzgerald, C. Kingsley &S. Umans, Mc Graw-Hill Companies, 5th editon.
3. Electrical Machines – P.S. Bimbra., Khanna Publishers.
4. Electromechanical Energy Conversion with Dynamics of Machines – by R. D. Begamudre, New Age International (P) Ltd., Publishers, 2nd edition, 1998.
5. Electric Machines – M. V. Deshpande, Wheeler Publishing, 1997.
6. Electrical Machines -S.K. Battacharya.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – I Semester **T P C**
0 3 2

(CE 05257) FLUID MECHANICS & HYDRAULIC MACHINES LAB

1. Impact of jets on Vanes.
2. Performance Test on Pelton Wheel.
3. Performance Test on Francis Turbine.
4. Performance Test on Kaplan Turbine.
5. Performance Test on Single Stage Centrifugal Pump.
6. Performance Test on Multi Stage Centrifugal Pump.
7. Performance Test on Reciprocating Pump.
8. Calibration of Venturimeter.
9. Calibration of Orifice meter.
10. Determination of friction factor for a given pipe line.
11. Determination of loss of head due to sudden contraction in a pipeline.
12. Turbine flow meter.

Note : Any 10 of the above 12 experiments are to be conducted.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – I Semester **T P C**
0 3 2

(EE 05190) 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE - II Semester	T	P	C
	4+1	0	4

(HS 05353) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

UNIT - I

Introduction to Managerial Economics : Definition, Nature and Scope 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).

2005-2006

UNIT VIII

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

TEXT BOOKS :

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

REFERENCES :

1. Ambrish Gupta, Financial Accounting for Management, Pearson Education, New Delhi, 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE - II Semester

T	P	C
4+1	0	4

(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-sports of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts. - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

2005-2006

UNIT - V

Environmental Pollution : Definition, Cause, effects and control measures of :

a. Air pollution
b. Water pollution
c. Soil pollution
d. Marine pollution
e. Noise pollution
f. Thermal pollution
g. Nuclear hazards

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

UNIT - VI

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

UNIT - VII

Human Population and the Environment : Population growth, variation among nations. Population explosion - Family Welfare Programme. -Environment and human health. -Human Rights. -Value Education. -HIV/AIDS. -Women and Child Welfare. -Role of information Technology in Environment and human health. -Case Studies.

UNIT - VIII

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

TEXT BOOK :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – II Semester	T	P	C
	4+1	0	4

(EC 05342) 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 & Linear Integrated Circuits – R.F. Coughlin & Fredrick F. Driscoll, PHI, 1977.
2. Operational Amplifiers & Linear Integrated Circuits: Theory & Applications –Denton J. Daibey, TMH.
3. Design with Operational Amplifiers&Analog Integrated Circuits-Sergio Franco,McGraw Hill,3rd Ed.,2002.
4. Digital Fundamentals – Floyd and Jain, Pearson Education,8th Edition, 2005.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – II Semester	T	P	C
	4+1	0	4

(EE 05467) POWER SYSTEMS - I

UNIT - I

Thermal Power Stations : Line diagram of Thermal Power Station (TPS) showing paths of coal, steam, water, air, ash and flue gasses.- Brief description of TPS components: Economizers, Boilers, Super heaters, Turbines, Condensers, Chimney and Cooling towers.

UNIT - II

Gas and Nuclear Power Stations : Nuclear Power Stations: Nuclear Fission and Chain reaction.- Nuclear fuels.- Principle of operation of Nuclear reactor.-Reactor Components: Moderators, Control rods, Reflectors and Coolants.- Radiation hazards: Shielding and Safety precautions.- Types of Nuclear reactors and brief description of PWR, BWR and FBR.

Gas Power Stations: Principle of Operation and Components (Block Diagram Approach Only).

UNIT - III

General Aspects of Distribution Systems and D.C. Distribution Systems : Classification of Distribution Systems.- Comparison of DC vs. AC and Under-Ground vs. Over- Head Distribution Systems.- Requirements and Design features of Distribution Systems.-

Voltage Drop Calculations (Numerical Problems) in D.C Distributors for the following cases: Radial D.C Distributor fed one end and at the both the ends (equal/unequal Voltages) and Ring Main Distributor.

UNIT - IV

A.C. Distribution Systems : Voltage Drop Calculations (Numerical Problems) in A.C. Distributors for the following cases: Power Factors referred to receiving end voltage and with respect to respective load voltages.

UNIT - V

Substations : Classification of substations: **Air insulated substations** - Indoor & Outdoor substations: Substations layout showing the location of all the substation equipment.

Bus bar arrangements in the Sub-Stations: Simple arrangements like single bus bar, sectionalized single bus bar, main and transfer bus bar system with relevant diagrams.

Gas insulated substations (GIS) – Advantages of Gas insulated substations, different types of gas insulated substations, single line diagram of gas insulated substations, bus bar, construction aspects of GIS, Installation and maintenance of GIS, Comparison of Air insulated substations and Gas insulated substations.

UNIT - IV

Power factor and Voltage Control : Causes of low p.f,-Methods of Improving p.f.-Phase advancing and generation of reactive KVAR using static Capacitors-Most economical p.f. for constant KW load and constant KVA type loads, Numerical Problems.

Dependency of Voltage on Reactive Power flow - Methods of Voltage Control : Shunt Capacitors, Series Capacitors, Synchronous Capacitors, Tap changing and Booster Transformers.

UNIT - VII

Economic Aspects of Power Generation : Load curve, load duration and integrated load duration curves-load, demand, diversity, capacity, utilization and plant use factors- Numerical Problems.

UNIT - VIII

Tariff Methods : Costs of Generation and their division into Fixed, Semi-fixed and Running Costs.

Desirable Characteristics of a Tariff Method.-Tariff Methods: Flat Rate, Block-Rate, two-part, three –part, and power factor tariff methods and Numerical Problems

TEXT BOOKS :

1. Principles of Power Systems by V.K Mehta and Rohit Mehta S.CHAND & COMPANY LTD., New Delhi 2004.
2. A Text Book on Power System Engineering by M.L.Soni, P.V.Gupta, U.S.Bhatnagar and A.Chakraborti, Dhanpat Rai & Co. Pvt. Ltd., 1999.

REFERENCES :

1. Electrical Power Systems by C.L.Wadhawa New age International (P) Limited, Publishers 1997.
2. Electrical Power Generation, Transmission and Distribution by S.N.Singh., PHI, 2003.
3. Hand book of Switchgear(BHEL) Tata Mc-Graw Hill Publication 2005.
4. Gas turbine performance, by PP Wals, P.Fletcher, Blackwell Publisher, 2004.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

II Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05194) ELECTRICAL MACHINES - II

UNIT-I

Single Phase Transformers – Construction & Operation : Single phase transformers-types - constructional details-minimization of hystersis and eddy current losses-emf equation - operation on no load and on load - phasor diagrams

UNIT-II

Single Phase Transformers - Performance : Equivalent circuit - losses and efficiency-regulation. All day efficiency - effect of variations of frequency & supply voltage on iron losses.

UNIT-III

Testing of Single Phase Transformer and Autotransformer : OC and SC tests - Sumpner's test - predetermination of efficiency and regulation-separation of losses test-parallel operation with equal and unequal voltage ratios - auto transformers-equivalent circuit - comparison with two winding transformers.

UNIT-IV

Polyphase Transformers : Polyphase transformers - Polyphase connections - Y/Y, Y/Δ, Δ/Y, Δ/Δ and open D, Third harmonics in phase voltages-three winding transformers-tertiary windings-determination of Zp, Zs and Zt transients in switching - off load and on load tap changing; Scott connection.

UNIT-V

Polyphase Induction Motors : Polyphase induction motors-construction details of cage and wound rotor machines-production of a rotating magnetic field - principle of operation - rotor emf and rotor frequency - rotor reactance, rotor current and pf at standstill and during operation

UNIT-VI

Characteristics of Induction Motors : Rotor power input, rotor copper loss and mechanical power developed and their inter relation-torque equation-deduction from torque equation - expressions for maximum torque and starting torque - torque slip characteristic - double cage and deep bar rotors - equivalent circuit - phasor diagram - crawling and cogging.

UNIT-VII

Circle Diagram of Induction Motors : Circle diagram-no load and blocked rotor tests-predetermination of performance-methods of starting and starting current and torque calculations

UNIT-VIII

Speed Control Methods : Speed control-change of frequency; change of poles and methods of consequent poles; cascade connection. injection of an emf into rotor circuit (qualitative treatment only)-induction generator-principle of operation.

TEXT BOOKS :

1. Electric Machines –by I.J.Nagrath & D.P.Kothari,Tata Mc Graw Hill, 7th Edition.2005
2. Electromechanics-II (transformers and induction motors) S. Kamakashaiah Right Publishers.

REFERENCES:

1. Performance and Design of AC Machines-M.G.Say.BPB Publishers
2. Electric machinery - A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw Hill
3. Companies, 5th edition
4. Electrical machines-PS Bhimbra, Khanna Publishers.
5. Theory of Alternating Current Machinery- by Langsdorf, Tata McGraw-Hill Companies, 2nd edition.
6. Electrical Machines – M.V Deshpande, Wheeler Publishing
7. Electrical Machines – J.B. Gupta, S.K. Khataria & Son's Publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

II Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05149) 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.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

II Year B.Tech. EEE – II Semester

T	P	C
0	3	2

(EC 05300) I.C. AND PULSE & DIGITAL CIRCUITS LAB

1. Linear wave shaping
2. Non Linear Wave Shaping – Clippers
3. Non Linear Wave Shaping – Clampers
4. Study of Logic Gates & Some Applications
5. Astable Multivibrator, Monostable Multivibrator using transistors
6. Bistable Multivibrator, Schmit Trigger using transistors
7. IC 741 OP AMP Applications – Adder, Integrator and Differentiator Circuits
8. Active Filters – LPF, HPF (first order)
9. Function Generator using 741 OP AMP
10. IC 555 Timer – Monostable Operation Circuits, Astable Operation Circuits
11. Schmitt Trigger Circuits – Using IC 741 and IC 555
12. Voltage Regulator using IC 723
13. 4 bit DAC using 741 OP AMP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

II Year B.Tech. EEE – II Semester | **T** | **P** | **C**
| 0 | 3 | 2

(EE 05196) ELECTRICAL MACHINES LAB – I

The following experiments are required to be conducted compulsory experiments :

1. Magnetization characteristics of DC shunt generator. Determination of critical field resistance and critical speed.
2. Load test on DC shunt generator. Determination of characteristics.
3. Load test on DC series generator. Determination of characteristics.
4. Load test on DC compound generator. Determination of characteristics.
5. Hopkinson's test on DC shunt machines. Predetermination of efficiency.
6. Fields test on DC series machines. Determination of efficiency.
7. Swinburne's test and speed control of DC shunt motor. Predetermination of efficiencies.
8. Brake test on DC compound motor. Determination of performance curves. In addition to the above eight experiments, atleast any two of the experiments from the following list are required to be conducted:
9. Brake test on DC shunt motor. Determination of performance curves.
10. Retardation test on DC shunt motor. Determination of losses at rated speed.
11. Separation of losses in DC shunt motor.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – I Semester | **T** | **P** | **C**
| 4+1 | 0 | 4

(CS 05140) COMPUTER ORGANIZATION

UNIT-I

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

UNIT-II

REGISTER TRANSFER LANGUAGE AND MICROOPERATIONS : Register Transfer language. Register Transfer Bus and memory transfers, Arithmetic Mircrooperatiaons, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.

Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer

UNIT-III

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

UNIT-IV

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

UNIT-V

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

UNIT-VI

INPUT-OUTPUT ORGANIZATION : Peripheral Devices, Input-Output Interface, Asynchronous data transfer Modes of Transfer, Priority Interrupt Direct memory Access, Input –Output Processor (IOP) Serial communication; Introduction to peripheral component, Interconnect (PCI) bus. Introduction to standard serial communication protocols like RS232, USB, IEEE1394.

UNIT-VII

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

UNIT-VIII

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

TEXT BOOKS :

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

REFERENCES :

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, - Sivaraama Dandamudi Springer Int. Edition.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

III Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05198) ELECTRICAL MEASUREMENTS

UNIT-I

Measuring Instruments : Classification – deflecting, control and damping torques – Ammeters and Voltmeters – PMMC, moving iron type instruments – expression for the deflecting torque and control torque – Errors and compensations, extension of range using shunts and series resistance. Electrostatic Voltmeters-electrometer type and attracted disc type – Extension of range of E.S. Voltmeters.

UNIT –II

Instrument transformers : CT and PT – Ratio and phase angle errors – design considerations Type of P.F. Meters – dynamometer and moving iron type – 1-ph and 3-ph meters – Frequency meters – resonance type and Weston type – synchoroscopes.

UNIT –III

Measurement of Power : Single phase dynamometer wattmeter, LPF and UPF, Double element and three element dynamometer wattmeter, expression for deflecting and control torques – Extension of range of wattmeter using instrument transformers. – Measurement active and reactive powers in balanced and unbalanced systems.

UNIT –IV

Measurement of Energy : Single phase induction type energy meter – driving and braking torques – errors and compensations – testing by phantom loading using R.S.S. meter. Three phase energy meter – trivector meter, maximum demand meters.

UNIT – V

Potentiometers : Principle and operation of D.C. Crompton's potentiometer – standardization – Measurement of unknown resistance, current, voltage.

A.C. Potentiometers: polar and coordinate types standardization – applications.

UNIT – VI

Resistance Measurements : Method of measuring low, medium and high resistance – sensitivity of Wheatstone's bridge – Carey Foster's bridge, Kelvin's double bridge for measuring low resistance, measurement of high resistance – loss of charge method.

UNIT –VII

A.C. Bridges : Measurement of inductance, Quality Factor - Maxwell's bridge, Hay's bridge, Anderson's bridge, Owen's bridge.

Measurement of capacitance and loss angle - Desauty bridge. Wien's bridge – Schering Bridge.

UNIT – VIII

Magnetic Measurements : Ballistic galvanometer – equation of motion – flux meter – constructional details, comparison with ballistic galvanometer. Determination of B-H Loop methods of reversals six point method – A.C. testing – Iron loss of bar samples– core loss measurements by bridges and potentiometers.

TEXT BOOK:

1. Electrical Measurements and measuring Instruments – by E.W. Golding and F.C. Widdis, fifth Edition, Wheeler Publishing.
2. Electrical & Electronic Measurement & Instruments by A.K.Shawney Dhanpat Rai & Sons Publications.

REFERENCES:

1. Electrical Measurements – by Buckingham and Price, Prentice – Hall
2. Electrical Measurements by Harris.
3. Electrical Measurements: Fundamentals, Concepts, Applications – by Reissland, M.U, New Age International (P) Limited, Publishers.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

III Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05468) POWER SYSTEMS - II

UNIT-I

Transmission Line Parameters : Types of conductors - calculation of resistance for solid conductors - Calculation of inductance for single phase and three phase, single and double circuit lines, concept of GMR & GMD, symmetrical and asymmetrical conductor configuration with and without transposition, Numerical Problems.

Calculation of capacitance for 2 wire and 3 wire systems, effect of ground on capacitance, capacitance calculations for symmetrical and asymmetrical single and three phase, single and double circuit lines, Numerical Problems.

UNIT-II

Performance of Short and Medium Length Transmission Lines : Classification of Transmission Lines - Short, medium and long line and their model representations - Nominal-T, Nominal-Pie and A, B, C, D Constants for symmetrical & Asymmetrical Networks, Numerical Problems.

Mathematical Solutions to estimate regulation and efficiency of all types of lines - Numerical Problems.

UNIT-III

Performance of Long Transmission Lines : Long Transmission Line-Rigorous Solution, evaluation of A,B,C,D Constants, Interpretation of the Long Line Equations, Incident, Reflected and Refracted Waves -Surge Impedance and SIL of Long Lines, Wave Length and Velocity of Propagation of Waves - Representation of Long Lines - Equivalent-T and Equivalent Pie network models (numerical problems).

UNIT – IV

Power System Transients : Types of System Transients - Travelling or Propagation of Surges - Attenuation, Distortion, Reflection and Refraction Coefficients - Termination of lines with different types of conditions - Open Circuited Line, Short Circuited Line, T-Junction, Lumped Reactive Junctions (Numerical Problems). Bewley's Lattice Diagrams (for all the cases mentioned with numerical examples).

UNIT-V

Various Factors Governing the Performance of Transmission line : Skin and Proximity effects - Description and effect on Resistance of Solid Conductors -

Ferranti effect - Charging Current - Effect on Regulation of the Transmission Line, Shunt Compensation.

Corona - Description of the phenomenon, factors affecting corona, critical voltages and power loss, Radio Interference.

UNIT-VI

Overhead Line Insulators : Types of Insulators, String efficiency and Methods for improvement, Numerical Problems - voltage distribution, calculation of string efficiency, Capacitance grading and Static Shielding.

UNIT-VII

Sag and Tension Calculations : Sag and Tension Calculations with equal and unequal heights of towers, Effect of Wind and Ice on weight of Conductor, Numerical Problems - Stringing chart and sag template and its applications.

UNIT-VIII

Underground Cables : Types of Cables, Construction, Types of Insulating materials, Calculations of Insulation resistance and stress in insulation, Numerical Problems.
Capacitance of Single and 3-Core belted cables, Numerical Problems.
Grading of Cables - Capacitance grading, Numerical Problems, Description of Inter-sheath grading.

TEXT BOOKS :

1. Modern Power System Analysis - by I.J.Nagarath and D.P Kothari, Tata Mc Graw-Hill, 2nd edition.
2. Electrical power systems - by C.L.Wadhwa, New Age International (P) Limited, Publishers,1998.

REFERENCES:

1. Power system Analysis-by John J Grainger William D Stevenson, TMC Companies, 4th editiontion.
2. Power System Analysis and Design by B.R.Gupta, Wheeler Publishing.
3. Power System Analysis by Hadi Saadat – TMH Edition..
4. Theory and Problems of Electric Power Systems-by S.A.Nasar, Schaum's Outline series, Mc Graw-Hill Company 1990.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05459) POWER ELECTRONICS

UNIT – I

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

UNIT – II

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

UNIT – III

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

UNIT – IV

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

UNIT – V

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

UNIT – VI

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

UNIT – VII

CHOPPERS : Choppers – Time ratio control and Current limit control strategies – Step down choppers Derivation of load voltage and currents with R, RL and RLE loads- Step up Chopper – load voltage expression

Morgan's chopper – Jones chopper and Oscillation chopper (Principle of operation only) Waveforms —– AC Chopper – Problems.

UNIT – VIII

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

TEXT BOOKS :

1. Power Electronics – by M. D. Singh & K. B. Kanchandhani, Tata Mc Graw – Hill Publishing company,1998.
2. Power Electronics - by V.R.Murthy , 1st edition -2005, OXFORD University Press.

REFERENCES :

1. Power Electronics, devices, converters and applications by G. Tulasi Ram Das,B.S. Publications.
2. Power Electronics : Circuits, Devices and Applications – by M. H. Rashid, Prenties Hall of India 2nd edition, 1998.
3. Power Electronics – by Vedam Subramanyam, New Age International (P) Limited, Publishers
4. Power Electronics – by C. W. Lander, Mc Graw – Hill companies, 2nd edition,1993.
5. Power Electronics : Principles and Applications – by J. Vithayathil, Mc Graw – Hill companies, 2nd edition,1995.
6. Power Electronics-by P.C.Sen,Tata Mc Graw-Hill Publishing.
7. Thyristorised Power Controllers – by G. K. Dubey, S. R. Doradra, A. Joshi and R. M. K. Sinha, New Age International (P) Limited Publishers, 1996.
8. "Modern Power Electronics : Evolution, Technology and applications" – by B. K. Bose, Jaico Publishing House,1999.
9. A Text book on Power Electronics-Harish C. Rai,Galgotia Publications,3rd Edition.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

III Year B.Tech. EEE – I Semester | **T** | **P** | **C**
| **4+1** | **0** | **4**

(EE 05195) ELECTRICAL MACHINES - III

UNIT – I

Construction and Principle of operation : Constructional Features of round rotor and salient pole machines – Armature windings – Integral slot and fractional slot windings; Distributed and concentrated windings – distribution, pitch and winding factors – E.M.F Equation.

UNIT - II

Synchronous Generator Characteristics : Harmonics in generated e.m.f. – suppression of harmonics – armature reaction - leakage reactance – synchronous reactance and impedance – experimental determination - phasor diagram – load characteristics.

UNIT – III

Regulation of Synchronous Generator : Regulation by synchronous impedance method, M.M.F. method, Z.P.F. method and A.S.A. methods – salient pole alternators – two reaction analysis – experimental determination of X_d and X_q (Slip test) Phasor diagrams – Regulation of salient pole alternators.

UNIT – IV

Parallel Operation of Synchronous Generator : Synchronizing alternators with infinite bus bars – synchronizing power torque – parallel operation and load sharing - Effect of change of excitation and mechanical power input. Analysis of short circuit current wave form – determination of sub-transient, transient and steady state reactances.

UNIT – V

Synchronous Motors – Principle of Operation : Theory of operation – phasor diagram – Variation of current and power factor with excitation – synchronous condenser – Mathematical analysis for power developed .

UNIT - VI

Power Circles : Excitation and power circles – hunting and its suppression – Methods of starting – synchronous induction motor.

UNIT – VII

Single Phase Motors : Single phase Motors: Single phase induction motor – Constructional features-Double revolving field theory – Elementary idea of cross-field theory – split-phase motors – shaded pole motor.

UNIT – VIII

Special Motors : Principle & performance of A.C. Series motor-Universal motor – Principle of permanent magnet and reluctance motors.

TEXT BOOKS :

1. Electric Machines – by I.J.Nagrath & D.P.Kothari, Tata Mc Graw-Hill Publishers, 7th Edition 2005.
2. Electrical Machines – by P.S. Bimbra, Khanna Publishers.

REFERENCES:

1. The Performance and Design of A.C.Machines – by M.G.Say, ELBS and Ptiman & Sons.
2. Electric Machinery – by A.E. Fitzgerald, C.Kingsley and S.Umans, Mc Graw-Hill Companies, 5th edition, 1990.
3. Electrical Machines – by Mukerjee and Chjakravarthy, Khanna Publishers.
4. Theory of Alternatinf Current Machinery by Langsdorf, Tata Mc Graw-Hill, 2nd edition.
5. Electromachines-III (Synchronous and single-phase machines), S.Kamakashiah, Right Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05343) LINEAR AND DISCRETE SYSTEMS ANALYSIS

UNIT - I

STATE VARIABLE ANALYSIS : Choice of state variables in Electrical networks-Formulation of state equations for Electrical networks-Equivalent source method.Network topological method - Solution of state equations-Analysis of simple networks with state variable approach.

UNIT - II

APPLICATION OF FOURIER SERIES : RMS, average value of a non sinusoidal periodic wave form-Expression for power with non sinusoidal voltage and current-Power factor-Effect of harmonics-Analysis of simple circuits with non sinusoidal inputs.

UNIT - III

FOURIER TRANSFORM APPLICATIONS : Representation of non periodic functions-Fourier integral-Fourier transform-Graphical Representation-Properties of Fourier transforms-Persaval's theorem-Fourier transform of constant, unit step, unit impulse, unit ramp signals and exponential functions-relationship with Laplace transform.

UNIT - IV

LAPLACE TRANSFORM APPLICATIONS : Application of Laplace transform methods of analysis :

Response of RL, RC and RLC networks to step, ramp, pulse and impulse functions, shifting and scaling theorems-Laplace transform of periodic functions-Convolution theorem-Convolution integral-Applications.

UNIT - V

TESTING OF POLYNOMIALS : Elements of realisability-Hurwitz polynomials-positive real functions-Properties-Testing-Sturm's Test, examples.

UNIT - VI

NETWORK SYNTHESIS : Network synthesis : Synthesis one port LC networks-Foster and Cauer methods-Synthesis of RL and RC one port networks-Foster and Cauer methods.

UNIT - VII

SAMPLING : Sampling theorm – Graphical and Analytical proof for Band Limited Signal impulse sampling, natural and Flat top Sampling, Reconstruction of signal from its samples, effect of under sampling – Aliasing, introduction to Band Pass sampling, Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Power density spectrum, Relation between auto correlation function and Energy / Power spectral density function.

UNIT - VIII

Z-TRANSFORMS : Fundamental difference between continous and discrete time signals, discrete time complex, exponential and sinusoidal signals, periodicity of discrete time complex exponential, concept of

2005-2006

Z-Transform of a discrete sequence. Distinction between Laplace, Fourier and Z-Transforms. Region of convergence in Z-Transforms, constraints on ROC for various classes of signals, Inverse Z-Transform properties of Z-Transforms.

TEXT BOOKS :

1. Signals, Systems and Communications by B.P. Lathi, BS Publications 2003.
2. Network Analysis and Synthesis – B C Kuo

REFERENCES :

1. Linear System Analysis – A N Sripathi, New Age International
2. Network and Systems – D Roy Chowdhary, New Age International
3. Engineering Network Analysis and Filter Desgin- Gopal G Bhisk & Umesh.
4. Network Analysis and Synthesis – Umesh Sinha- Satya Prakashan Publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – I Semester **T P C**
0 3 2

(EE 05197) ELECTRICAL MACHINES LAB – II

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

1. O.C. & S.C. Tests on Single phase Transformer
2. Sumpner's test on a pair of single phase transformers
3. Scott connection of transformers
4. No-load & Blocked rotor tests on three phase Induction motor
5. Regulation of a three –phase alternator by synchronous impedance & m.m.f. methods
6. V and Inverted V curves of a three—phase synchronous motor.
7. Equivalent Circuit of a single phase induction motor
8. Determination of Xd and Xq of a salient pole synchronous machine

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

1. Parallel operation of Single phase Transformers
2. Separation of core losses of a single phase transformer
3. Brake test on three phase Induction Motor
4. Regulation of three-phase alternator by Z.P.F. and A.S.A methods
5. Efficiency of a three-phase alternator
6. Heat run test on a bank of 3 Nos. of single phase Delta connected transformers
7. Measurement of sequence impedance of a three-phase alternator.
8. Performance characteristics of a Schrage motor.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – I Semester **T P C**
0 3 2

(EE 05150) CONTROL SYSTEMS LAB

The following are the experiments required to e conducted as compulsory experiments:

1. Time response of Second order system
2. Characteristics of Synchros
3. Programmable logic controller – Study and Verification of truth tables of logic gates, simple boolean expressions and application of speed control of motor.
4. Effect of feedback on DC servo motor
5. Transfer function of DC motor
6. Effect of P, PD, PI, PID Controller on a second order systems
7. State space model for classical transfer function using MATLAB – Verification
8. Simulation of Transfer functions using operational amplifier

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

1. Lag and lead compensation – Magnitude and phase plot
2. Transfer function of DC generator
3. Temperature controller using PID
4. Characteristics of magnetic amplifiers
5. Characteristics of AC servo motor
6. Root locus plot, Bode Plot from MATLAB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EC 05176) 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 Chebshev, 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 & 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.
   Digital Signal Processing – Thomas J. Cavicchi, WSE, John Wiley, 2004.
4. Digital Signal Processors, Architecture, Programming & Applications, - B. Venkata Ramani, M. Bhaskar, TMH, 4th reprint, 2004.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05404) MICROPROCESSORS AND MICROCONTROLLERS

UNIT-I

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

UNIT-II

ASSEMBLY LANGUAGE PROGRAMMMING OF 8086 : Assembly Directives, Macro's, Simple Programs using Assembler, Implimentation of FOR Loop, WHILE, REPEAT and IF-THEN-ELSE Features, String Manupulation, Procedures.

UNIT-III

I/O INTERFACE : Parallel data transfer scream, Programmed I/O, Interrupt Driven I/O, 8255 PPI, Various modes of operations and interface of I/O devices to 8086, A/D, D/A Converter Interfacing, Stepper Motor Interfacing.

UNIT-IV

INTERFACING WITH ADVANCED DEVICES : 8086 System bus structure, Memory and I/O Interfacing with 8086, Interfacing through various IC Peripheral Chips, 8257 (DMA Controller), 8259 (Interrupt Priority Control), Memory Interface using RAMS, EPROMS and EEPROMS.

UNIT-V

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

UNIT-VI

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

UNIT-VII

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

UNIT- VIII

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

TEXT BOOKS :

1. Kenneth J Ayala, " The 8051 Micro Controller Architecture, Programming and Applications", Thomson Publishers, 2nd Edition.
2. Kenneth J Ayala, " The 8086 Micro Processors Architecture, Programming and Applications", Thomson Publishers, 2005.

REFERENCES:

1. Ajay V. Deshmukh, "Microcontrollers – theory applications", Tata McGraw-Hill Companies – 2005.
2. D.V.Hall, "Micro Processor and Interfacing ", Tata McGraw-Hill.
3. Ray and BulChandi, " Advanced Micro Processors", Tata McGraw-Hill.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(HS 05352) MANAGEMENT SCIENCE

UNIT - I

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

UNIT - II

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

UNIT - IIII

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

UNIT - IV

Materials Management : Objectives, Need for Inventory control, EOQ, ABC Analysis, Purchase Procedure, Stores Management and Stores Records.

***Marketing* :** Functions of Marketing, Marketing Mix, Marketing Strategies based on Product Life Cycle, Channels of distribution

UNIT - V

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

UNIT - VI

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

UNIT - VII

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

2005-2006

UNIT - VIII

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

TEXT BOOKS :

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

REFERENCES :

1. Kotler Philip & Keller Kevin Lane: Marketing Mangement 12/e, PHI, 2005
2. Koontz & Weihrich: *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. EEE – II Semester

T	P	C
4+1	0	4

(EE 05321) INSTRUMENTATION

UNIT-I

Characteristics of Signals : Measuring Systems, Performance Characteristics, - Static characteristics, Dynamic Characteristics; Errors in Measurement – Gross Errors, Systematic Errors, Statistical Analysis of Random Errors.

UNIT-II

Signals and their representation : Signal and their representation: Standard Test, periodic, aperiodic, modulated signal, sampled data, pulse modulation and pulse code modulation

UNIT-III

Oscilloscope : Cathode ray oscilloscope-Cathode ray tube-time base generator-horizantal and vertical amplifiers-CRO probes-applications of CRO-Measurement of phase and frequency-lissajous patterns-Sampling oscilloscope-analog and digital type

UNIT-IV

Digital Voltmeters : Digital voltmeters- Successive approximation, ramp, dual-Slope integration continuos balance type-Micro processor based ramp type DVM digital frequency meter-digital phase angle meter-

UNIT-V

Signal Analyzers : Wave Analysers- Frequency selective analyzers, Heterodyne, Application of Wave analyzers- Harmonic Analyzers, Total Harmonic distortion, spectrum analyzers, Basic spectrum analyzers, spectral displays, vector impedance meter, Q meter. Peak reading and RMS voltmeters

UNIT-VI

Transducers : Definition of transducers, Classification of transducers, Advantages of Electrical transducers, Characteristics and choice of transducers; Principle operation of resistor, inductor, LVDT and capacitor transducers; LVDT Applications, Strain gauge and its principle of operation, guage factor, Thermistors, Tthermocouples, Synchros, Piezo electric transducers, photovoltaic, photo conductive cells, photo diodes.

UNIT-VII

Measurement of Non-Electrical Quantities-I : Measurement of strain, Gauge Sensitivity, Displacement, Velocity, Angular Velocity, Acceleration, Force, Torque.

UNIT-VIII

Measurement of Non-Electrical Quantities-II : Measurement of Temperature, Pressure, Vacuum, Flow, Liquid level.

TEXT BOOKS :

1. Transducers and Instrumentation by D.V.S Murthy, Prentice Hall of India
2. A course in Elect. & Electronic Measurements & Instrumentation,A.K.Sawhney,Dhampatrai & Sons.

REFERENCES :

1. Measurements Systems, Applications and Design – by D O Doeblin.
2. Principles of Measurement and Instrumentation – by A.S Morris, Pearson /Prentice Hall of India.
3. Elements of Electronic Instrumentation and Measurement, Joseph J. Carr, Pearson Education 2003.
4. Electronic Instrumentation-by H.S.Kalsi Tata MCGraw-Hill Edition, 199
5. Instrumentation: Devices and Systems – by C.S. Rangan, G.R. Sarma and Mani, TMH.
6. Modern Electronic Instrumentation and Measurement techniques – by A.D Helfrick and W.D.Cooper, Pearson/Prentice Hall of India.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05538) SWITCHGEAR AND PROTECTION

UNIT – I

Circuit Breakers - 1 : Circuit Breakers: Elementary principles of arc interruption, Recovery, Restriking Voltage and Recovery voltages.- Restriking Phenomenon, Average and Max. RRRV, Numerical Problems. Current Chopping and Resistance Switching. CB ratings and Specifications : Types and Numerical Problems. – Auto reclosures.

UNIT –II

Circuit Breakers - 2 : Description and Operation of following types of circuit breakers: Minimum Oil Circuit breakers, Air Blast Circuit Breakers, Vacuum and SF6 circuit breakers.

UNIT – III

Electromagnetic and Static Relays : Principle of Operation and Construction of Attracted armature, Balanced Beam, induction Disc and Induction Cup relays.

Relays Classification: Instantaneous, DMT and IDMT types.

Application of relays: Over current/ Under voltage relays, Direction relays, Differential Relays and Percentage Differential Relays.

Universal torque equation, Distance relays: Impedance, Reactance and Mho and Off-Set Mho relays, Characteristics of Distance Relays and Comparison.

Static Relays: Static Relays verses Electromagnetic Relays.

UNIT – IV

Generator Protection : Protection of generators against Stator faults, Rotor faults, and Abnormal Conditions. Restricted Earth fault and Inter-turn fault Protection. Numerical Problems on % Winding Unprotected.

UNIT –V

Transformer Protection : Protection of transformers: Percentage Differential Protection, Numerical Problem on Design of CT s Ratio, Buchholtz relay Protection.

UNIT –VI

Feeder and Bus-Bar Protection : Protection of Lines: Over Current, Carrier Current and Three-zone distance relay protection using Impedance relays. Translay Relay.

Protection of Bus bars – Differential protection.

UNIT – VII

Neutral Grounding : Grounded and Ungrounded Neutral Systems.- Effects of Ungrounded Neutral on system performance. Methods of Neutral Grounding: Solid, Resistance, Reactance - Arcing Grounds and Grounding Practices.

UNIT – VIII

Protection against over voltages : Generation of Over Voltages in Power Systems.-Protection against Lightning Over Voltages - Valve type and Zinc-Oxide Lighting Arresters. Insulation and Coordination -BIL, Impulse Ratio, Standard Impulse Test Wave, Volt-Time Characteristics and Insulation Co-ordination

TEXT BOOKS :

1. Switchgear and Protection – by Sunil S Rao, Khanna Publlishers
2. Power System Protection and Switchgear by Badari Ram , D.N Viswakarma, TMH Publications

REFERENCES :

1. Fundamentals of Power System Protection by Paithankar and S.R.Bhide.,PHI, 2003.
2. Power System Protection : Static Relays – by T S Madhav Rao Tata McGraw-Hill, 2nd edition
3. Art & Science of Protective Relaying – by C R Mason, Wiley Eastern Ltd.
4. Electrical Power Systems – by Cl Wadhwa, New Age international (P) Limited, Publishers, 3nd editon
5. Hand Book of Switchgears by BHEL, TMH Publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05291) HIGH VOLTAGE ENGINEERING

UNIT I

INTRODUCTION TO HIGH VOLTAGE TECHNOLOGY AND APPLICATIONS : Electric Field Stresses, Gas / Vaccum as Insulator, Liquid Dielectrics, Solids and Composites, Estimation and Control of Electric Stress, Numerical methods for electric field computation, Surge voltages, their distribution and control, Applications of insulating materials in transformers, rotating machines, circuit breakers, cable power capacitors and bushings.

UNIT II

BREAK DOWN IN GASEOUS AND LIQUID DIELECTRICS : Gases as insulating media, collision process, Ionization process, Townsend's criteria of breakdown in gases, Paschen's law. Liquid as Insulator, pure and commercial liquids, breakdown in pure and commercial liquids.

UNIT III

BREAK DOWN IN SOLID DIELECTRICS : Intrinsic breakdown, electromechanical breakdown, thermal breakdown, breakdown of solid dielectrics in practice, Breakdown in composite dielectrics, solid dielectrics used in practice.

UNIT IV

GENERATION OF HIGH VOLTAGES AND CURRENTS : Generation of High Direct Current Voltages, Generation of High alternating voltages, Generation of Impulse Voltages, Generation of Impulse currents, Tripping and control of impulse generators.

UNIT V

MEASUREMENT OF HIGH VOLTAGES AND CURRENTS : Measurement of High Direct Current voltages, Measurement of High Voltages alternating and impulse, Measurement of High Currents-direct, alternating and Impulse, Oscilloscope for impulse voltage and current measurements.

UNIT VI

OVER VOLTAGE PHENOMENON AND INSULATION CO-ORDINATION : Natural causes for over voltages – Lightning phenomenon, Overvoltage due to switching surges, system faults and other abnormal conditions, Principles of Insulation Coordination on High voltage and Extra High Voltage power systems.

UNIT VII

NON-DISTRUCTIVE TESTING OF MATERIAL AND ELECTRICAL APPARATUS : Measurement of D.C Resistivity, Measurement of Dielectric Constant and loss factor, Partial discharge measurements.

UNIT VIII

HIGH VOLTAGE TESTING OF ELECTRICAL APPARATUS : Testing of Insulators and bushings, Testing of Isolators and circuit breakers, Testing of cables, Testing of Transformers, Testing of Surge Arresters, Radio Interference measurements.

TEXT BOOKS :

1. High Voltage Engineering by M.S.Naidu and V. Kamaraju – TMH Publications, 3rd Edition.
2. High Voltage Engineering: Fundamentals by E.Kuffel, W.S.Zaengl, J.Kuffel by Elsevier, 2nd Edition.

REFERENCES :

1. High Voltage Engineering by C.L.Wadhwa, New Age Internationals (P) Limited, 1997.
2. High Voltage Insulation Engineering by Ravindra Arora, Wolfgang Mosch, New Age International (P) Limited, 1995.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
0	3	2

(EE 05199) ELECTRICAL MEASUREMENTS LAB

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

1. Calibration and Testing of single phase energy Meter
2. Calibration of dynamometer power factor meter
3. Crompton D.C. Potentiometer – Calibration of PMMC ammeter and PMMC voltmeter.
4. Kelvin's double Bridge – Measurement of resistance – Determination of Tolerance.
5. Measurement of % ratio error and phase angle of given C.T. by comparison.
6. Schering bridge & Anderson bridge.
7. Measurement of 3 phase reactive power with single-phase wattmeter.
8. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.

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

9. Optical bench – Determination of polar curve measurement of MHCP of filament lamps
10. Calibration LPF wattmeter – by Phantom testing
11. Measurement of 3 phase power with single watt meter and 2 No's of C.T.
12. C.T. testing using mutual Inductor – Measurement of % ratio error and phase angle of given C.T. by Null method.
13. P.T. testing by comparison – V.G. as Null detector – Measurement of % ratio error and phase angle of the given P.T.
14. Dielectric oil testing using H.T. testing Kit
15. LVDT and capacitance pickup – characteristics and Calibration
16. Resistance strain gauge – strain measurements and Calibration
17. Polar curve using Lux meter, Measurement of intensity of illumination of fluorescent lamp.
18. Transformer turns ratio measurement using a.c. bridge.
19. Relay testinf using secondary current injection set for over current & reverse current.
20. A.C. Potentiometer – Polar form/Cartesian form – Calibration of AC Voltmeter, Parameters of Choke.
21. Measurement of Iron loss in a bar specimen using a CRO and using a wattmeter.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III Year B.Tech. EEE – II Semester

T	P	C
0	3	2

(EE 05460) POWER ELECTRONICS LAB

List of Experiments in Power Electronics Lab :

The Following experiments are required to be conducted as compulsory experiments

1. Study of Characteristics of SCR, MOSFET & IGBT
2. Gate firing circuits for SCR's
3. Single Phase AC Voltage Controller with R and RL Loads
4. Single Phase fully controlled bridge converter with R and RL loads
5. Forced Commutation circuits (Class A, Class B, Class C, Class D & Class E)
6. DC Jones chopper with R and RL Loads
7. Single Phase Parallel, inverter with R and RL loads
8. Single Phase Cycloconverter with R and RL loads

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

9. Single Phase Half controlled converter with R load.
10. Three Phase half controlled bridge converter with R-load.
11. Single Phase series inverter with R and RL loads.
12. Single Phase Bridge converter with R and RL loads.
13. Single Phase dual converter with RL loads.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05425) 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.

2005-2006

UNIT VIII

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

Fuzzy logic applications : Fuzzy logic control and Fuzzy classification.

TEXT BOOK :

1. Neural Networks, Fuzzy logic, Genetic algorithms: synthesis and applications by Rajasekharan and Rai – PHI Publication.
2. Introduction to Artificial Neural Systems - Jacek M. Zuarda, 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
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05464) POWER SEMICONDUCTOR DRIVES

UNIT – I

Control of DC motors by Single phase Converters : Introduction to Thyristor controlled Drives, Single Phase semi and Fully controlled converters connected to d.c separately excited and d.c series motors – continuous current operation – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque Characteristics- Problems on Converter fed d.c motors.

UNIT - I

Control of DC motors by Three phase Converters : Three phase semi and fully controlled converters connected to d.c separately excited and d.c series motors – output voltage and current waveforms – Speed and Torque expressions – Speed – Torque characteristics – Problems.

UNIT – III

Four Quadrant operation of DC Drives : Introduction to Four quadrant operation – Motoring operations, Electric Braking – Plugging, Dynamic and Regenerative Braking operations. Four quadrant operation of D.C motors by dual converters – Closed loop operation of DC motor (Block Diagram Only).

UNIT-IV

Control of DC motors by Choppers : Single quadrant, Two –quadrant and four quadrant chopper fed dc separately excited and series excited motors – Continuos current operation – Output voltage and current wave forms – Speed torque expressions – speed torque characteristics – Problems on Chopper fed d.c Motors – Closed Loop operation (Block Diagram Only).

UNIT – V

Control of Induction Motor through Stator voltage: Variable voltage characteristics-Control of Induction Motor by Ac Voltage Controllers – Waveforms – speed torque characteristics.

UNIT – VI

Control of Induction Motor through Stator Frequency : Variable frequency characteristics-Variable frequency control of induction motor by Voltage source and current source inverter and cyclo converters-PWM control – Comparison of VSI and CSI operations – Speed torque characteristics – numerical problems on induction motor drives – Closed loop operation of induction motor drives (Block Diagram Only).

UNIT –VII

Control of Induction motor of Rotor side : Static rotor resistance control – Slip power recovery – Static Scherbius drive – Static Kramer Drive – their performance and speed torque characteristics – advantages applications – problems

UNIT – VIII

Control of Synchronous Motors : Separate control & self control of synchronous motors – Operation of self controlled synchronous motors by VSI and CSI cycloconverters. Load commutated CSI fed Synchronous Motor – Operation – Waveforms – speed torque characteristics – Applications – Advantages and Numerical Problems – Closed Loop control operation of synchronous motor drives (Block Diagram Only), variable frequency control, Cyclo converter, PWM, VFI, CSI

TEXT BOOKS :

1. Fundamentals of Electric Drives – by G K Dubey Narosa Publications
2. Power Electronics – MD Singh and K B Khanchandani, Tata – McGraw-Hill Publishing company,1998

REFERENCES:

1. Power Semiconductor Controlled Drives – Gopal K Dubey PH International Publications.
2. Power Semiconductor Drives - S B Dewan, G R Selmon, A Straughen
3. Power Electronic Control of AC drives – B K Bose
4. Thyristor Control of Electric drives – Vedam Subramanyam Tata McGraw Hill Publilcations.
5. Electric Drives – By N K de and P K Sen , Prentice Hall of India Pvt. Ltd.
6. A First course on Electrical Drives – S K Pillai New Age International(P) Ltd. 2nd Editon
7. Analysis of Thyristor Power – Conditioned Motors – By S K Pillai, Unversity Press (India) Ltd. Orient Longman Ltd. 1995.
8. Fundamental of Electric Drives – by Mohd. AEL – Sharkawi by VIKAS Publishing House.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05465) POWER SYSTEM ANALYSIS

UNIT - I

Power System Network Matrices - 1 : Graph Theory: Definitions, Bus Incidence Matrix, Y_{bus} formation by Direct and Singular Transformation Methods, Numerical Problems.

UNIT -II

Power System Network Matrices - 2 : Formation of Z_{Bus}: Partial network, Algorithm for the Modification of Z_{Bus} Matrix for addition element for the following cases: Addition of element from a new bus to reference, Addition of element from a new bus to an old bus, Addition of element between an old bus to reference and Addition of element between two old busses (Derivations and Numerical Problems).- Modification of Z_{Bus} for the changes in network (Problems).

UNIT –III

Power flow Studies -1 : Necessity of Power Flow Studies – Data for Power Flow Studies – Derivation of Static load flow equations – Load flow solutions using Gauss Seidel Method: Acceleration Factor, Load flow solution with and without P-V buses, Algorithm and Flowchart. Numerical Load flow Solution for Simple Power Systems (Max. 3-Buses): Determination of Bus Voltages, Injected Active and Reactive Powers (Sample One Iteration only) and finding Line Flows/Losses for the given Bus Voltages.

UNIT – IV

Power flow Studies - 2 : Newton Raphson Method in Rectangular and Polar Co-Ordinates Form: Load Flow Solution with or without PV Busses- Derivation of Jacobian Elements, Algorithm and Flowchart.

Decoupled and Fast Decoupled Methods.- Comparison of Different Methods.

UNIT – V

Short Circuit Analysis-1 : Per-Unit System of Representation. Per-Unit equivalent reactance network of a three phase Power System, Numerical Problems.

Symmetrical fault Analysis : Short Circuit Current and MVA Calculations, Fault levels, Application of Series Reactors, Numerical Problems.

UNIT –VI

Short Circuit Analysis-2 : Symmetrical Component Theory: Symmetrical Component Transformation, Positive, Negative and Zero sequence components: Voltages, Currents and Impedances.

Sequence Networks : Positive, Negative and Zero sequence Networks, Numerical Problems.

Unsymmetrical Fault Analysis : LG, LL, LLG faults with and without fault impedance, Numerical Problems.

UNIT –VII

Power System Steady State Stability Analysis : Elementary concepts of Steady State, Dynamic and Transient Stabilities.

Description of : Steady State Stability Power Limit, Transfer Reactance, Synchronizing Power Coefficient, Power Angle Curve and Determination of Steady State Stability and Methods to improve steady state stability.

2005-2006

UNIT –VIII

Power System Transient State Stability Analysis : Derivation of Swing Equation. Determination of Transient Stability by Equal Area Criterion, Application of Equal Area Criterion, Critical Clearing Angle Calculation.- Solution of Swing Equation: Point-by-Point Method. Methods to improve Stability - Application of Auto Reclosing and Fast Operating Circuit Breakers.

TEXT BOOKS :

1. Computer Methods in Power Systems by E.W.Stagg and El-Abiad, Mc-Graw Hill Publications
2. *Modern Power system Analysis* – by I.J.Nagrath & D.P.Kothari: Tata McGraw-Hill Publishing company, 2nd edition.

REFERENCES:

1. *Power system Stability* – by E.W.Kimbark Vols. I & III. Willey Publications , Inc.
2. *Computer Modelling of Electrical Power Systems* by J.Arrillaga, C.P.Arnord & B.J.Harker, Wiley Publishers.
3. *Power System Analysis* – by A.R.Bergen, Prentice Hall, Inc.
4. *Power System Analysis* by Hadi Saadat – TMH Edition.
5. *Power System Analysis* by N.V.Ramana and N.Yadaiah, Pearson Education.
6. Modeling of Power System Components by K. Viswa Varma, Right Publications, Hyd, Jan. 2005.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05466) POWER SYSTEM OPERATION AND CONTROL

UNIT – I

Economic Operation of Power Systems-1 : Optimal operation of Generators in Thermal Power Stations, - heat rate Curve – Cost Curve – Incremental fuel and Production costs, input-output characteristics, Optimum generation allocation with line losses neglected.

UNIT – II

Economic Operation of Power Systems-2 : Optimum generation allocation including the effect of transmission line losses – Loss Coefficients, General transmission line loss formula.

UNIT – III

Hydrothermal Scheduling : Optimal scheduling of Hydrothermal System: Hydroelectric power plant models, Scheduling problems-Short term Hydrothermal scheduling problem.

UNIT –IV

Modelling of Turbine, Generator and Automatic Controllers : Modelling of Turbine: First order Turbine model, Block Diagram representation of Steam Turbines and Approximate Linear Models.

Modelling of Generator (Steady State and Transient Models) : Description of Simplified Network Model of a Synchronous Machine (Classical Model), Description of Swing Equation (No Derivation) and State-Space II-Order Mathematical Model of Synchronous Machine.

Modelling of Governor : Mathematical Modelling of Speed Governing System – Derivation of small signal transfer function.

Modelling of Excitation System : Fundamental Characteristics of an Excitation system, Ttransfer function, Block Diagram Representation of IEEE Type-1 Model

UNIT – V

Single Area Load Frequency Control : Necessity of keeping frequency constant.

Definitions of Control area – Single area control – Block diagram representation of an isolated power system – Steady state analysis – Dynamic response – Uncontrolled case.

UNIT – VI

Two-Area Load Frequency Control : Load frequency control of 2-area system – uncontrolled case and controlled case, tie-line bias control

UNIT-VII

Load Frequency Controllers : Proportional plus Integral control of single area and its block diagram representation, steady state response – Load Frequency Control and Economic dispatch control.

UNIT – VIII

Reactive Power Control : Overview of Reactive Power control – Reactive Power compensation in transmission systems – advantages and disadvantages of different types of compensating equipment for transmission systems; load compensation – Specifications of load compensator, Uncompensated and compensated transmission lines: shunt and Series Compensation.

TEXT BOOKS :

1. Electrical Power Systems by C.L.Wadhwa, Newage International-3rd Edition.
2. Modern Power System Analysis – by I.J.Nagrath & D.P.Kothari Tata M Graw – Hill Publishing Company Ltd, 2nd edition.

REFERENCES :

1. Power System Analysis and Design by J.Duncan Glover and M.S.Sarma., THOMPSON, 3rd Edition.
2. Electric Power systems – by B.M.Weedy, B.J.Cary 4th Edition , Wiley.
3. Economic Operation of Power systems – by L.K.Kirchmayer, Wiley Eastern Ltd.
4. Power System Analysis by N.V.Ramana and N.Yadaiah, Pearson Education.
5. Electric Energy systems Theory – by O.I.Elgerd, Tata Mc Graw-hill Publishing Comapany Ltd., Second edition.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

IV Year B.Tech. EEE – I Semester **T P C**
0 3 2

(EE 05405) MICROPROCESSORS AND MICROCONTROLLERS LAB

I . Microprocessor 8086 :

Introduction to MASM/TASM.

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

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

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

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

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

II. Interfacing :

8259 – Interrrupt Controller.

8279 – Keyboard Disply.

8255 – PPI.

8251 – USART.

III. Mcrocontroller 8051:

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

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

IV Year B.Tech. EEE – I Semester **T P C**
0 3 2

(EE 05520) SIMULATION OF ELECTRICAL SYSTEMS LAB

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

1. PSPICE Simulation of Transient and Parametric Analysis of RLC circuits to an input (i) Pulse (ii) Step and (iii) Sinusoidal signals.
2. Analysis of three phase circuit representing the generator transmission line and load. Plot three phase currents & neutral current using PSPICE.
3. PSPICE simulation of single-phase full converter using RLE loads and single phase AC voltage controller using RLE loads.
4. PSPICE simulation of DC Circuits (Thevenin's Equivalent, Transfer Function).
5. Linear system analysis (Time domain analysis, error analysis) using MATLAB.
6. Stability analysis (Bode, Root Locus, Nyquist) of Linear Time Invariant Systems using MATLAB.
7. Simulation of Dynamical Systems (Single area and two area Power Systems) using SIMULINK.
8. Circuit Analysis using MATLAB (SimPowerSystems Tools Box)

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

1. PSPICE simulation of Resonant pulse commutation circuit and Buck chopper
2. PSPICE simulation of single phase Inver with PWM control
3. Modelling of transformer and simulation of loss less transmission line in PSPICE.
4. PSPICE simulation of Op-Amp based Integrator & Differentiator circuits.
5. Transient simulation of RLC circuits using EMTP.
6. Transient simulation of Transformers using EMTP.

TEXT BOOK :

1. "Simulation Tools for Electrical Engineers", N. Yadaiah and G. Tulasi Ram Das, Pearson Education.

REFERENCES :

1. PSPICE for circuits and electronics using PSPICE – by M.H.Rashid, M/s. PHI Publications.
2. PSPICE A/D user's manual – Microsim, USA
3. PSPICE reference guide – Microsim, USA
4. MATLAB and its Tool Boxes user's manual and – Mathworks, USA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(EE 05568) UTILIZATION OF ELECTRICAL ENERGY

UNIT – I

ELECTRIC DRIVES : Type of electric drives, choice of motor, starting and running characteristics, speed control, temperature rise, particular applications of electric drives, types of industrial loads, continuous, intermittent and variable loads, load qualization.

UNIT – II

ELECTRIC HEATING : Advantages and methods of electric heating, resistance heating induction heating and dielectric heating.

UNIT – III

ELECTRIC WELDING : Electric welding, resistance and arc welding, electric welding equipment, comparison between A.C. and D.C. Welding.

UNIT – IV

ILLUMINATION FUNDAMENTALS : Introduction, terms used in illumination, laws of illumination, polar curves, photometry, integrating sphere, sources of light.

UNIT – V

VARIOUS ILLUMINATION METHODS : Discharge lamps, MV and SV lamps – comparison between tungsten filament lamps and fluorescent tubes, Basic principles of light control, Types and design of lighting and flood lighting.

UNIT – VI

ELECTRIC TRACTION – I : System of electric traction and track electrification. Review of existing electric traction systems in India. Special features of traction motor, methods of electric braking-plugging rheostatic braking and regenerative braking.

UNIT – VII

ELECTRIC TRACTION – II : Mechanics of train movement. Speed-time curves for different services – trapezoidal and quadrilateral speed time curves.

UNIT – VIII

ELECTRIC TRACTION-III : Calculations of tractive effort, power, specific energy consumption for given run, effect of varying acceleration and braking retardation, adhesive weight and braking retardation adhesive weight and coefficient of adhesion.

TEXT BOOKS :

1. Utilisation of Electric Energy – by E. Openshaw Taylor, Orient Longman.
2. Art & Science of Utilization of electrical Energy – by Partab, Dhanpat Rai & Sons.

REFERENCES :

1. Utilization of Electrical Power including Electric drives and Electric traction – by N.V.Suryanarayana, New Age International (P) Limited, Publishers, 1996.
2. Generation, Distribution and Utilization of electrical Energy – by C.L. Wadhwa, New Age International (P) Limited, Publishers, 1997.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05006) ADVANCED CONTROL SYSTEMS
(**ELECTIVE – I**)

UNIT – I

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

UNIT – II

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

UNIT – III

DESCRIBING FUNCTION ANALYSIS : Introduction to nonlinear systems, Types of nonlinearities, describing functions, describing function analysis of nonlinear control systems.

UNIT-IV

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

UNIT-V

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

UNIT – VI

MODAL CONTROL : Effect of state feedback on controllability and observability, Design of State Feedback Control through Pole placement. Full order observer and reduced order observer.

UNIT-VII

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

UNIT –VIII

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

TEXT BOOKS:

1. Modern Control 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. Nagarath 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.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester	T	P	C
	4+1	0	4

(ME 05427) NON–CONVENTIONAL SOURCES OF ENERGY
(ELECTIVE-I)

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 titled 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 joul 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. Splar 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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EC 05574) 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 ωo; 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 μm 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 - τ - 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.

TEXTBOOKS :

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

REFERENCES :

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

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester

T	P	C
4+1	0	4

(EE 05505) RELIABILITY ENGINEERING & APPLICATIONS TO POWER SYSTEMS
(ELECTIVE - II)

UNIT – I

Basics of Probability theory & Distribution : Basic probability theory – rules for combining probabilities of events – Bernoulli's trials – probabilities density and distribution functions – binomial distribution – expected value and standard deviation of binomial distribution.

UNIT – II

Network Modelling and Reliability Analysis : Analysis of Series, Parallel, Series-Parallel networks – complex networks – decomposition method.

UNIT – III

Reliability functions : Reliability functions f(t), F(t), R(t), h(t) and their relationships – exponential distribution – Expected value and standard deviation of exponential distribution – Bath tub curve – reliability analysis of series parallel networks using exponential distribution – reliability measures MTTF, MTTR, MTBF.

UNIT – IV

Markov Modelling : Markov chains – concept of stochastic transitional probability Matrix, Evaluation of limiting state Probabilities. – Markov processes one component repairable system – time dependent probability evaluation using Laplace transform approach – evaluation of limiting state probabilities using STPM – two component repairable models.

UNIT – V

Frequency & Duration Techniques : Frequency and duration concept – Evaluation of frequency of encountering state, mean cycletime, for one , two component repairable models – evaluation of cumulative probability and cumulative frequency of encountering of merged states.

UNIT – VI

Generation System Reliability Analysis : Reliability model of a generation system– recursive relation for unit addition and removal – load modeling - Merging of generation load model – evaluation of transition rates for merged state model – cumulative Probability, cumulative frequency of failure evaluation – LOLP, LOLE.

UNIT – VII

Composite Systems Reliability Analysis : Decompositions method – Reliability Indices – Weather Effects on Transmission Lines.

UNIT – VIII

Distribution System and Reliability Analysis : Basic Concepts – Evaluation of Basic and performance reliability indices of radial networks.

TEXT BOOKS :

1. Reliability Evaluation of Engg. System – R. Billinton, R.N.Allan, Plenum Press, New York.
2. Reliability Evaluation of Power systems – R. Billinton, R.N.Allan, Pitman Advance Publishing Program, New York.

REFERENCE :

1. An Introduction to Reliability and Maintainability Engineering. Charles E. Ebeling, TATA Mc Graw - Hill – Edition.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester | T 4+1 | P 0 | C 4

(EE 05439) OPTIMIZATION TECHNIQUES
(ELECTIVE - II)

UNIT – I

Introduction and Classical Optimization Techniques : Statement of an Optimization problem – design vector – design constraints – constraint surface – objective function – objective function surfaces – classification of Optimization problems.

UNIT – II

Classical Optimization Techniques : Single variable Optimization – multi variable Optimization without constraints – necessary and sufficient conditions for minimum/maximum – multivariable Optimization with equality constraints. Solution by method of Lagrange multipliers – multivariable Optimization with inequality constraints – Kuhn – Tucker conditions.

UNIT – III

Linear Programming : Standard form of a linear programming problem – geometry of linear programming problems – definitions and theorems – solution of a system of linear simultaneous equations – pivotal reduction of a general system of equations – motivation to the simplex method – simplex algorithm.

UNIT – VI

Transportation Problem : Finding initial basic feasible solution by north – west corner rule, least cost method and Vogel's approximation method – testing for optimality of balanced transportation problems.

UNIT – V

Unconstrained Nonlinear Programming : One – dimensional minimization methods: Classification, Fibonacci method and Quadratic interpolation method

U**NIT – VI**

Unconstrained Optimization Techniques : Univariate method, Powell's method and steepest descent method.

UNIT – VII

Constrained Nonlinear Programming : Characteristics of a constrained problem, Classification, Basic approach of Penalty Function method; Basic approach of Penalty Function method; Basic approaches of Interior and Exterior penalty function methods. Introduction to convex Programming Problem.

UNIT – VIII

Dynamic Programming : Dynamic programming multistage decision processes – types – concept of sub optimization and the principle of optimality – computational procedure in dynamic programming – examples illustrating the calculus method of solution - examples illustrating the tabular method of solution.

TEXT BOOKS :

1. "Engineering optimization: Theory and practice"-by S. S.Rao, New Age International (P) Limited, 3rd edition, 1998.
2. "Introductory Operations Research" by H.S. Kasene & K.D. Kumar, Springer (India), Pvt .Ltd.

REFERENCES:

1 "Optimization Methods in Operations Research and systems Analysis" – by K.V. Mital and C. Mohan, New Age International (P) Limited, Publishers, 3rd edition, 1996.
2. Operations Research – by Dr. S.D.Sharma.
3. "Operations Research : An Introduction" – by H.A. Taha, PHI Pvt. Ltd., 6th edition.
4. Linear Programming – by G. Hadley.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – I Semester | T 4+1 | P 0 | C 4

(EE 05191) ELECTRICAL DISTRUBUTION SYSTEMS
(ELECTIVE - II)

UNIT – I

GENERAL CONCEPTS : Introduction to distribution systems, Load modelling and characteristics. Coincidence factor, contribution factor loss factor. Relationship between the load factor and loss factor. Classification of loads (Residential, commercial, Agricultural and Industrial) and their characteristics.

UNIT – II

DISTRIBUTION FEEDERS : Design Considerations of Distribution Feeders: Radial and loop types of primary feeders, voltage levels, feeder loading; basic design practice of the secondary distribution system.

UNIT – III

SUBSTATIONS : Location of Substations: Rating of distribution substation, service area within primary feeders. Benefits derived through optimal location of substations.

UNIT – IV

SYSTEM ANALYSIS : Voltage drop and power-loss calculations: Derivation for voltage drop and power loss in lines, manual methods of solution for radial networks, three phase balanced primary lines.

UNIT – V

PROTECTION : Objectives of distribution system protection, types of common faults and procedure for fault calculations. Protective Devices: Principle of operation of Fuses, Circuit Reclosures, line sectionalizes, and circuit breakers

UNIT – VI

COORDINATION : Coordination of Protective Devices: General coordination procedure.

UNIT – VII

COMPENSATION FOR POWER FACTOR IMPROVEMENT : Capacitive compensation for power-factor control.

Different types of power capacitors, shunt and series capacitors, effect of shunt capacitors (Fixed and switched), Power factor correction, capacitor allocation. Economic justification. Procedure to determine the best capacitor location.

UNIT – VIII

VOLTAGE CONTROL : Voltage Control: Equipment for voltage control, effect of series capacitors, effect of AVB/AVR, line drop compensation.

TEXT BOOK :

1. "Electric Power Distribution system, Engineering" – by Turan Gonen, Mc Graw-hill Book Company.

REFERENCE :

1. Electric Power Distribution – by A.S. Pabla, Tata Mc Graw-hill Publishing company, 4th edition, 1997.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester | T 4+1 | P 0 | C 4

(EC 05170) DIGITAL CONTROL SYSTEMS
(ELECTIVE - III)

UNIT – I

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

UNIT-II THE Z – TRANSFORMS : Introduction, Linear difference equations, pulse response, Z – transforms, Theorems of Z – Transforms, the inverse Z – transforms, Modified Z- Transforms.

UNIT - III

Z-PLANE ANALYSIS OF DISCRETE-TIME CONTROL SYSTEM : Z-Transform method for solving difference equations; Pulse transforms function, block diagram analysis of sampled – data systems, mapping between s-plane and z-plane.

UNIT – IV

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

UNIT – V

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

UNIT – VI

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

UNIT – VII

DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS : Transient and steady – State response Analysis – Design based on the frequency response method – Bilinear Transformation and Design procedure in the w-plane, Lead, Lag and Lead-Lag compensators and digital PID controllers.

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.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester | T 4+1 | P 0 | C 4

(EE 05282) H.V.D.C. TRANSMISSION
(ELECTIVE-III)

UNIT – I

BASIC CONCEPTS : Economics & Terminal equipment of HVDC transmission systems: Types of HVDC Links – Apparatus required for HVDC Systems – Comparison of AC &DC Transmission, Application of DC Transmission System – Planning & Modern trends in D.C. Transmission.

UNIT – II

ANALYSIS OF HVDC CONVERTERS : Choice of Converter configuration – analysis of Graetz – characteristics of 6 Pulse & 12 Pulse converters – Cases of two 3 phase converters in star –star mode – their performance.

UNIT – III

CONVERTER & HVDC SYSTEM CONTROL : Principal of DC Link Control – Converters Control Characteristics – Firing angle control – Current and extinction angle control – Effect of source inductance on the system; Starting and stopping of DC link; Power Control.

UNIT - IV

REACTIVE POWER CONTROL IN HVDC : Reactive Power Requirements in steady state-Conventional control strategies-Alternate control strategies-sources of reactive power-AC Filters – shunt capacitors-synchronous condensers.

UNIT – V

POWER FLOW ANALYSIS IN AC/DC SYSTEMS : Modelling of DC Links-DC Network-DC Converter-Controller Equations-Solution of DC loadflow – P.U. System for d.c. quantities-solution of AC-DC Power flow-Simultaneous method-Sequential method.

UNIT-VI

CONVERTER FAULT & PROTECTION : Converter faults – protection against over current and over voltage in converter station – surge arresters – smoothing reactors – DC breakers –Audible noise-space charge field-corona effects on DC lines-Radio interference.

UNIT – VII

HARMONICS : Generation of Harmonics –Characteristics harmonics,calculation of AC Harmonics,Non-Characteristics harmonics, adverse effects of harmonics – Calculation of voltage & Current harmonics – Effect of Pulse number on harmonics

UNIT - VIII

FILTERS : Types of AC filters,Design of Single tuned filters –Design of High pass filters.

TEXT BOOKS:

1. HVDC Power Transmission Systems: Technology and system Interactions – by K.R.Padiyar, New Age International (P) Limited, and Publishers.
2. EHVAC and HVDC Transmission Engineering and Practice – S.Rao.

REFERENCES:

1. HVDC Transmission – J.Arrillaga, Pet%r Peregrinus.
2. Direct Current Transmission – by E.W.Kimbark, John Wiley & Sons.
3. Power Transmission by Direct Current – by E.Uhlmann, B.S.Publications.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(CS 05216) EMBEDDED SYSTEMS
(ELECTIVE - III)

UNIT I

Embedded Computing : Introduction, Complex Systems and Microprocessor, The Embedded System Design Process, Formalisms for System Design, Design Examples. (Chapter I from Text Book 1, Wolf).

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. Chapter 3 from Text Book 2, Ayala)

UNIT III

Basic Assembly Language Programming Concepts : The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions. (Chapters 4,5 and 6 from Text Book 2, Ayala)

UNIT IV

Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts. (Chapter 7and 8 from Text Book 2, Ayala)

UNIT V

Applications : Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication. (Chapter 10 and 11 from Text Book 2, Ayala)

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. (Chapter 6 and 7 from Text Book 3, Simon)

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. (Chapter 8,9,10 & 11 from Text Book 3, Simon).

UNIT VIII

Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I^2C bus and CAN bus; Internet-Enabled Systems, Design Example-Elevator Controller. (Chapter 8 from Text Book 1, Wolf)

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.

2005-2006

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(CS 05521) SOFTWARE ENGINEERING
(ELECTIVE – IV)

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 & Design quality, Design concepts, the design model.

Creating an architectural design : Software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT-V : Object-Oriented Design : Objects and object classes, An Object-Oriented design process, Design evolution.

Performing User interface design: Golden rules, User interface analysis and design, interface analysis, interface design steps, Design evaluation.

UNIT-VI : Testing Strategies : A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.

Product metrics : Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

UNIT-VII : Metrics for Process and Products : Software Measurement, Metrics for software quality.

Risk management : Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.

UNIT-VIII : Quality Management : Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

TEXT BOOKS :

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

REFERENCES :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(CS 05159) DATABASE MANAGEMENT SYSTEMS
(ELECTIVE-IV)

UNIT – I

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

UNIT – II

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

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

UNIT – III

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

UNIT – IV

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition – Dependency preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – forth Normal Form.

UNIT – V

Overview of Transaction Management: ACID Properties – Transactions and Schedules – Concurrent Execution of transaction – Lock Based Concurrency Control – Performance Locking – Transaction Support in SQL – Introduction to Crash recovery.

UNIT – VI

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

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

2005-2006

UNIT – VII

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

UNIT – VIII

Storing data: Disks and Files : - The Memory Hierarchy – Redundant Arrays of Independent – Disks – Disk Space Management – Buffer Manager – Files of records – Page Formats – record formats.

Tree Structured Indexing: Intuitions for tree Indexes – Indexed Sequential Access Methods (ISAM) – B+ Trees: A Dynamic Index Structure.

Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing – Exendble vs. Liner hashing.

TEXT BOOKS :

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

REFERENCES :

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

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV Year B.Tech. EEE – II Semester

T	P	C
4+1	0	4

(CS 05434) OOPS THROUGH JAVA
(ELECTIVE – IV)

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.

Beginning in Java 2, Iver Horton, Wrox Publications.