

**ACADEMIC REGULATIONS  
COURSE STRUCTURE  
AND  
DETAILED SYLLABUS**

**ELECTRONICS &  
INSTRUMENTATION  
ENGINEERING**

*Shri*

**B.TECH. FOUR YEAR DEGREE COURSE**  
(Applicable for the batches admitted from 2005-2006)



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
KUKATPALLY, HYDERABAD - 500 072.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

**B.TECH. ELECTRONICS & INSTRUMENTATION ENGINEERING**  
I Year  
**COURSE STRUCTURE**

CODE	SUBJECT	T	P	C
HS05231	English	2+1*	-	4
MA05363	Mathematics – I	3+1*	-	6
MA05361	Mathematical Methods	3+1*	-	6
PY05047	Applied Physics	2+1*	-	4
CS05106	C Programming & Data Structures	3+1*	-	6
EC05422	Network Analysis	2+1*	-	4
EC05210	Electronic Devices & Circuits	3+1*	-	6
ME05220	Engineering Drawing Practice Lab	-	3	4
CS05144	Computer Programming Lab.	-	3	4
CS05337	IT Workshop	-	3	4
EC05211	Electronic Devices & Circuits Lab.	-	3	4
HS05232	English Language Communication skills Lab	-	3	4
<b>TOTAL</b>		<b>25</b>	<b>15</b>	<b>56</b>

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

**B.TECH. ELECTRONICS & INSTRUMENTATION ENGINEERING**

**COURSE STRUCTURE**

II Year		I Semester			
CODE	SUBJECT	T	P	C	
MA05365	Mathematics – III	4+1*	-	4	
EE05200	Electrical Technology	4+1*	-	4	
EI05206	Electromagnetic Waves & Transmission lines	4+1*	-	4	
EC05517	Signals & Systems	4+1*	-	4	
EC05497	Pulse & Digital Circuits	4+1*	-	4	
EE05539	Switching Theory & Logic Design	4+1*	-	4	
EE05201	Electrical Technology Lab.	-	3	2	
EC05498	Pulse & Digital Circuits Lab.	-	3	2	
<b>TOTAL</b>		<b>30</b>	<b>6</b>	<b>28</b>	

**II Year**

**II Semester**

CODE	SUBJECT	T	P	C	
HS05353	Managerial Economics & Financial Analysis	4+1*	-	4	
CE05239	Environmental Studies	4+1*	-	4	
IC05111	Calibration & Electronic Measurements	4+1*	-	4	
EE05149	Control Systems	4+1*	-	4	
EC05344	Linear IC Applications	4+1*	-	4	
EI05516	Sensors & Signal Conditioning	4+1*	-	4	
EC05345	Linear IC Applications Lab.	-	3	2	
EI05329	Instrumentation Lab. – I	-	3	2	
<b>TOTAL</b>		<b>30</b>	<b>6</b>	<b>28</b>	

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

**B.TECH. ELECTRONICS & INSTRUMENTATION ENGINEERING**

**COURSE STRUCTURE**

III Year		I Semester			
CODE	SUBJECT	T	P	C	
HS05352	Management Science	4+1*	-	4	
CS05140	Computer Organization	4+1*	-	4	
EC05172	Digital IC Applications	4+1*	-	4	
CS05435	Operating Systems	4+1*	-	4	
EI05309	Industrial Instrumentation	4+1*	-	4	
IC05479	Process Control Instrumentation	4+1*	-	4	
CS05209	Electronics Computer Aided Design Lab.	-	3	2	
IC05480	Process Control Lab.	-	3	2	
<b>TOTAL</b>		<b>30</b>	<b>6</b>	<b>28</b>	

**III Year**

**II Semester**

CODE	SUBJECT	T	P	C	
EI05055	Automation of Industrial Processes	4+1*	-	4	
EC05400	Microprocessors & Interfacing	4+1*	-	4	
EC05176	Digital Signal Processing	4+1*	-	4	
EC05471	Principles of Communication	4+1*	-	4	
IC05440	Optoelectronic & Laser Instrumentation	4+1*	-	4	
EI05090	Biomedical Instrumentation	4+1*	-	4	
EC05401	Microprocessors Lab.	-	3	2	
EI05330	Instrumentation Lab. – II	-	3	2	
<b>TOTAL</b>		<b>30</b>	<b>6</b>	<b>28</b>	

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

**B.TECH. ELECTRONICS & INSTRUMENTATION ENGINEERING**

**COURSE STRUCTURE**

IV Year	CODE	SUBJECT	I Semester		
			T	P	C
	EC05574	VLSI Design	4+1*	-	4
	CS05434	OOPS through JAVA	4+1*	-	4
	EI05038	Analytical Instrumentation	4+1*	-	4
	IC05443	P C Based Instrumentation	4+1*	-	4
		<b>ELECTIVE – I</b>	4+1*	-	4
	IC05463	Power Plant Instrumentation			
	CS05159	Database Management Systems			
	IC05572	Virtual Instrumentation			
		<b>ELECTIVE – II</b>	4+1*	-	4
	EC05170	Digital Control Systems			
	CS05049	Artificial Neural Networks			
	CS05138	Computer Networks			
	CS05338	JAVA Lab.			
	EI05331	Instrumentation Lab. - III	-	3	2
	<b>TOTAL</b>		<b>30</b>	<b>6</b>	<b>28</b>

IV Year	CODE	SUBJECT	II Semester		
			T	P	C
	EC05399	Micro Controllers & Applications	4+1*	-	4
		<b>ELECTIVE – III</b>	4+1*	-	4
	ME05508	Robotics & Automation			
	CS05308	Industrial Electronics			
	EC05215	Embedded & Real Time Systems			
		<b>ELECTIVE – IV</b>	4+1*	-	4
	EI05351	Management Information Systems			
	EN05544	Telemetry & Telecontrol			
	EC05183	DSP Processors & Architectures	-	-	2
	CA05315	Industry Oriented Mini Project Work	-	-	2
	CA05515	Seminar	-	-	2
	CA05495	Project Work	-	-	12
	<b>TOTAL</b>		<b>15</b>	<b>-</b>	<b>28</b>

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

\* : Tutorials

T : Theory periods per week P: Practical /Drawing Periods per week

C : Total Credits for the subject

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

I Year B.Tech. EIE

**(HS 05231) ENGLISH**

T P C  
2+1 0 4

**1. INTRODUCTION :**

In view of the growing importance of English as a tool for global communication and the consequent emphasis on training students to acquire communicative competence, the syllabus has been designed to develop linguistic and communicative competence of Engineering students. The prescribed books and the exercises are meant to serve broadly as students' handbooks, to encourage them to develop their language skills. The two textbooks identified by the Board of Studies serve the purpose of illustrating the conceptual framework within which the syllabus is to be administered in the classroom. When a textbook is prescribed content is generally paid attention to. However, the stress in this syllabus is on language acquisition and skill development, calling for both the teacher and the taught to go beyond the prescribed texts and innovative exercises and tasks.

**2. OBJECTIVES :**

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

**3. SYLLABUS :**

**Listening Skills :**

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

**Speaking Skills :**

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

**Reading Comprehension**

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

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

**Writing Skills :**

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

**4. TEXTBOOKS PRESCRIBED :**

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

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

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

**A. STUDY MATERIAL :****Unit – I**

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

**Unit – II**

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

**Unit – III**

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

**Unit – IV**

7. Environment from **LEARNING ENGLISH: A Communicative Approach, Orient Longman, 2005.**

8. Chapters 13-16 from **Wings of Fire: An Autobiography – APJ Abdul Kalam, an abridged version with Exercises, Universities Press (India) Pvt. Ltd., 2004**

**Unit – V**

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

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

**Unit – VI**

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

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

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

**Unit – VII**

- Reading and Writing Skills
- Reading Comprehension
- Situational dialogues
- Report writing
- Letter writing
- Essay writing
- Information transfer

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 Dixon, 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 Rutherford, 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**, Renuculri Mario, Cambridge University Press.

T P C  
3+1 0 6

I Year B.Tech. EIE  
**(MA05363) 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  $x$ ,  $e^{ax}(x)$ ,  $x^2V(x)$ , 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.Narainulu, 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, Sankaralah, VGS Book Links, Hyderabad.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD**

I Year B.Tech. EIE

T P C  
3+1 0 6

**(MA05361) MATHEMATICAL METHODS**

**UNIT I**

Matrices and Linear systems of equations: Elementary row transformations-Rank-Echelon form, Normal form – Solution of Linear Systems – Direct Methods- LU Decomposition- LU Decomposition from Gauss Elimination –Solution of Tri-diagonal Systems-Solution of Linear Systems.

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

Solution of Algebraic and Transcendental Equations : Introduction – The Bisection Method – The Method of False Position – The Iteration Method – Newton-Raphson Method. Interpolation: Introduction- Errors in Polynomial Interpolation – Finite differences- Forward Differences-Backward differences –Central differences – Symbolic relations and separation of symbols-Differences of a polynomial-Newton's formulae for interpolation – Central difference interpolation Formulae – Gauss' Central Difference Formulae –Interpolation with unevenly spaced points-Lagrange's Interpolation formula.

**UNIT V**

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 VI**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD**

T P C

2+1 0 4

I Year B.Tech. EIE

**(PY05047) 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 dislocation, 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.

**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.Abrutadel, Oxford University Press. Third Edition 2005.
6. Numerical Methods: V N Vadamurthy, Iyengar N Ch N Vikas pub. Reprint 2005
7. Numerical Methods: S.Arnumugam & 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, Sankaraiyah, 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.

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

**REFERENCES**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

I Year B.Tech. EIE

T P C  
3+1 0 6**(CS05106) C PROGRAMMING AND DATA STRUCTURES****UNIT-I:**

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

**UNIT-II:**

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

**UNIT-III :**

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

**UNIT-IV:**

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

**UNIT-V:**

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

**UNIT-VI:**

Linear Data Structures: Introduction to Data Structures, 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. C & Data Structures, E.Balaguruswamy, TMH.
4. Data Structures through C, Yogish Sachdeva, Galgotia.
5. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/Pearson Education

**HYDERABAD**

**I Year B.Tech. EIE**

**T P C**  
**2+1 0 4**

**(EC05422) NETWORK ANALYSIS**

**UNIT I**

Basic Voltage and Current relationships for R, L and C, 1<sup>st</sup> order Circuits, RL & RC, initial conditions for L and C, Kirchoff's Laws, Ideal Voltage and Current sources, Network Topology: Definitions, Graph, Tree, Basic Cutset and Basic Tiset Matrices for planar networks, Formulation of network equations using loop and nodal methods of Analysis with dependent and independent Voltage and Current sources. Duality and Dual networks.

**UNIT II**

Magnetic Circuits, Self and Mutual inductances, dot convention, impedance, reactance concept, Impedance transformation and coupled circuits, co-efficient of coupling, equivalent T for Magnetically coupled circuits, Ideal Transformer.

**UNIT III**

Steady state and transient analysis of RC, RL and RLC Circuits, Circuits with switches, step response, 2<sup>nd</sup> order series and parallel RLC Circuits, Root locus, damping factor, over damped, under damped, critically damped cases, quality factor and bandwidth for series and parallel resonance, resonance curves

**UNIT IV**

Network Analysis using Laplace transform techniques, step, impulse and exponential excitation, response due to periodic excitation, RMS and average value of periodic waveforms.

**UNIT V**

Network theorems, Tellegens, Superposition, Reciprocity, Thevinin's, Norton's, Max Power Transfer theorem, Milliman's Theorem (All without proof but with applications to network analysis) Complex Power, j Notation, phasor diagram, Sinusoidal steady state analysis, Duality in networks.

**UNIT VI**

Two port network parameters, Z, Y, ABCD, h and g parameters, Characteristic impedance, Image transfer constant, image and iterative impedance, network function, driving point and transfer functions – using transformed (S) variables, Poles and Zeros.

**UNIT VIII**

Standard T, p, L Sections, Characteristic impedance, image transfer constants, Design of Attenuators, impedance matching network, T and p Conversion

**UNIT VIII**

LC Networks and Filters: Properties of LC Networks, Foster's Reactance theorem, design of constant K, LP, HP and BP Filters, Composite filter design.

**TEXT BOOKS**

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

**REFERENCES**

1. Engineering Circuit Analysis – William Hayt and Jack E Kemmerly, MGH, 5<sup>th</sup> Edition, 1993.
2. Network Analysis and Synthesis – N.C.Jagan and C.Lakshminarayana, B.S. Publications, 2004.
3. Electric Circuits – J.Edminister and M.Nahvi – Schaum's Outlines, TMH, 1999.
4. Network Theory – Sudarshan and Shyam Mohan, TMH.
5. Communication Engineering Networks – Everitt and Anner.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

I Year B.Tech. EIE

T P C  
3+1 0 6**(EC05210) ELECTRONIC DEVICES AND CIRCUITS****UNIT I****ELECTRON DYNAMICS AND CRO**

Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection). Applications of CRO: Voltage, Current and Frequency Measurements.

**UNIT II****JUNCTION DIODE CHARACTERISTICS**

Review of semi conductor Physics – n and p –type semi conductors, Mass Action Law, Continuity Equation, Hall Effect, Open-circuited p-n junction, The p-n junction as a rectifier (forward bias and reverse bias), The current components in p-n diode, Law of junction, Diode equation, Energy band diagram of p-n diode, Volt-ampere characteristics of p-n diode, Temperature dependence of VI characteristic, Transition and Diffusion capacitances, Breakdown Mechanisms in Semi Conductor Diodes, Zener diode characteristics, Characteristics of Tunnel Diode, Varactor Diode.

**UNIT III****RECTIFIERS, FILTERS AND REGULATORS**

Half wave rectifier, ripple factor, full wave rectifier, Harmonic components in a rectifier circuit, Inductor filter, Capacitor filter, L- section filter,  $\Pi$ - section filter, Multiple L-section and Multiple  $\Pi$  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  $f_a$ ,  $f_R$  and  $f_T$ .

#### UNIT VII

##### FEEDBACK AMPLIFIERS

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

#### UNIT VIII

##### OSCILLATORS

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

##### TEXT BOOKS

1. Electronic Devices and Circuits – J.Millman and C.C.Halkias, Tata McGraw Hill, 1998.

2. Electronic Devices and Circuits – R.L. Boylestad and Louis Nashelsky, Pearson/Prentice Hall, 9<sup>th</sup> Edition, 2006.

##### REFERENCES

1. Electronic Devices and Circuits – T.F. Bogart Jr., J.S.Beasley and G.Rico, Pearson Education, 6<sup>th</sup> edition, 2004.

2. Principles of Electronic Circuits – S.G.Burns and P.R.Bond, Galgotia Publications,

3. 2<sup>nd</sup> Edn., 1998.

4. Microelectronics – Millman and Grabel, Tata McGraw Hill, 1988. Electronic Devices and Circuits – K. Lal Kishore, B.S. Publications, 2<sup>nd</sup> Edition, 2005

5. Electronic Devices and Circuits – K. Satya Prasad, VGS Booklinks, Vijayawada, Hyderabad, 1<sup>st</sup> Edition, 2005

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I Year B.Tech. EIE

T P C  
0 3 4

### (ME05220) ENGINEERING DRAWING PRACTICE LAB.

#### UNIT I

Introduction to engineering graphics – construction of ellipse, parabola and hyperbola – cylindrical curves.

#### UNIT II

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

#### UNIT III

Orthographic projections of solids : cylinder, cone, prism, pyramid and sphere positions and axis inclined to both the planes.

#### UNIT IV

Isometric projections of lines, planes and simple solids

#### UNIT V

Conversion of orthographic views into isometric views and vice-versa.

##### TEXTBOOKS

1. Engineering graphics - K.I.Narayana & P.Kannayya

2. Engineering drawings - .D.Bhatt

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY  
HYDERABAD**

**1 Year B.Tech. EIE**

**T P C  
0 3 4**

**(CS05144) 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)  $2.5 \log x + \cos 32^\circ + |x^2 - y^2| + \sqrt{2xy}$
  - 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  $1 + 2 + 3 + \dots + n$
  - c)  $1 + x^2/2! + x^2/4! + \dots$  upto ten terms
  - d)  $x + x^3/3! + x^5/5! + \dots$  upto 7<sup>th</sup> 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<sup>2</sup>). 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		Discount (Percentage)	
Amount	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 do-while to calculate and print the first n fibonacci numbers.

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

```

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

```

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.
  - j) 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.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

I Year B.Tech. EIE

T P C  
0 3 4

### (CS05337) IT WORKSHOP

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

**Internet & World Wide Web** module introduces the different ways of hooking the PC on to the internet from home and workplace and effectively usage of the internet. Usage of web browsers, email, newsgroups and discussion forums would be covered. In addition, awareness of cyber hygiene, i.e., protecting the personal computer from getting infected with the viruses, worms and other cyber attacks would be introduced.

**Productivity tools** module would enable the students in crafting professional word documents, excel spread sheets, power point presentations and personal web sites using the Microsoft suite of office tools and LaTeX

#### PC Hardware

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

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

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

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

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

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

## 2005-2006

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

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

## Internet & World Wide Web

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

**Week 10- Task 2** Web Browsers, Surfing the Web : Students customize their web browsers with the LAN proxy settings, bookmarks, search toolbars and pop up blockers. Also, plug-ins like Macromedia Flash and JRE for applets should be configured.

**Week 11 Task 3** Search Engines & Netiquette: Students should know what search engines are and how to use the search engines. A few topics would be given to the students for which they need to search on Google. This should be demonstrated to the instructors.

**Week 12- Task 4** Cyber Hygiene: Students would be exposed to the various threats on the internet and would be asked to configure their computer to be safe on the internet. They need to first install an anti virus software, configure their personal firewall and windows update on their computer. Then they need to customize their browsers to block pop ups, block active x downloads to avoid viruses and/or worms.

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

## LaTeX and Microsoft Word

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

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

## 2005-2006

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

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

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

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

## Microsoft Excel

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

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

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

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

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

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

## LaTeX and Microsoft Power Point

**Week 24 Task1** Students will be working on basic power point utilities and tools which help them create basic power point presentation.

Topic covered during this week includes :- PPT Orientation, Slide Layouts, Inserting Text, Word Art, Formatting Text, Bullets and Numbering, Auto Shapes, Lines and Arrows in both LaTeX and Powerpoint.

**Week 25 Task2** Second week helps students in making their presentations interactive.

Topic covered during this week includes :-Hyperlinks, Inserting –Images, Clip Art, Audio, Video, Objects, Tables and Charts

**Week 26 Task3** Concentrating on the in and out of Microsoft power point and presentations in LaTeX. Helps them learn best practices in designing and preparing power point presentation.

Topic covered during this week includes :- Master Layouts (slide, template, and notes), Types of views (basic, presentation, slide slotter, notes etc), Inserting – Background, textures, Design Templates, Hidden slides.

**Week 27 Task4** Entire week concentrates on presentation part of LaTeX and Microsoft power point.

Topic covered during this week includes- Using Auto content wizard, Slide Transition, Custom Animation, Auto Rehearsing

**Week 28 Task5** Power point test would be conducted. Students will be given model power point presentation which needs to be replicated (exactly how it's asked).

#### Microsoft Publisher

**Week 29** Help students in preparing their personal website using Microsoft publisher.

Topic covered during this week includes - Publisher Orientation, Using Templates, Layouts, Inserting text objects, Editing text objects, Inserting Tables, Working with menu objects, Inserting pages, Hyper linking, Renaming, deleting, modifying pages, Hosting website.

#### REFERENCES

1. Comdex Information Technology course tool kit - 'Vikas Gupta, WILEY Dreamtech
2. The Complete Computer upgrade and repair book - Cheryl A Schmidt, WILEY Dreamtech, 3rd edition
3. Introduction to Information Technology - ITL Education Solutions limited, Pearson Education.
4. PC Hardware and A+Handbook – Kate J. Chase, PHI (Microsoft).
5. LaTeX Companion – Leslie Lamport, PHI/Pearson.
6. All LaTeX and others related material is available at  
(a) [www.sssolutions.in](http://www.sssolutions.in) and  
(b) [www.sonitsoftsolutions.org](http://www.sonitsoftsolutions.org)

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD.

I Year B.Tech. EIE

T P C  
0 3 4

### (EC05211) ELECTRONIC DEVICES AND CIRCUITS LAB

#### PART A:-

##### ELECTRONIC WORKSHOP PRACTICE (in 6 lab sessions):

Identification, Specifications, Testing of R, L, C Components (Colour Codes), Potentiometers, Switches (SPDT, DPDT, and DIP), Coils, Gang Condensers, Relays, Bread Boards.

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.

Soldering practice – Simple Circuits using active and passive components. Single layer and Multi layer PCBs (Identification and Utility).

Study and operation of  
Multimeters (Analog and Digital)

Function Generator

Regulated Power Supplies

Study and Operation of CRO.

#### PART B:- (For Laboratory examination – Minimum of 16 experiments)

PN Junction diode characteristics

A. Forward bias B. Reverse bias.

Zener diode characteristics

Transistor CB characteristics (Input and Output)

Transistor CE characteristics (Input and Output)

Rectifier without filters (Full wave & Half wave)

Rectifier with filters (Full wave & Half wave)

FET characteristics

Measurement of h parameters of transistor in CB, CE, CC configurations

CE Amplifier

CC Amplifier (Emitter Follower).

Single stage R-C coupled Amplifier.

FET amplifier (Common Source)

Wien Bridge Oscillator

RC Phase Shift Oscillator

Feed back amplifier (Current Series).

Feed back amplifier (Voltage Series).

Hartley Oscillator.

Colpitts Oscillator.

SCR characteristics.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
**HYDERABAD**

I Year B.Tech. EIE

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 Benjeri (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.Balasuubramanian (Macmillan)
7. Lingua TOEFL CBT Insider, by Dreamtech
8. TOEFL & GRE ( KAPLAN, AARCO & BARRONS, USA, Cracking GRE by CLIFFS)
9. English Skills for Technical Students, WBSCTE with British Council, OL
10. A Handbook of English for Competitive Examinations, by B Shyamala Rao, Blake Books, Chennai.

**DISTRIBUTION AND WEIGHTAGE OF MARKS :**

**ENGLISH LANGUAGE LABORATORY PRACTICE**

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



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IInd Year B.Tech. EIE (I Semester)

**T P C**  
**4+1 0 4**

**(MA05365) MATHEMATICS III**

**UNIT I**

Special functions : Gamma and Beta Functions – Their properties – evaluation of improper integrals. Bessel functions – properties – Recurrence relations – Orthogonality. Legendre polynomials – Properties – Rodrigues 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  $Z$  ( $c$  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)  $\int_{\alpha}^{\beta} f(\cos\theta, \sin\theta)d\theta$

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

(d) Integrals by indentation.

**UNIT VII**

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

**UNIT VIII**

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

**TEXT BOOKS:**

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

**REFERENCES:**

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

**(EE05200) ELECTRICAL TECHNOLOGY****UNIT I - DC MACHINES**

Principle of operation of DC Machines- EMF equation – Types of generators – Magnetization and load characteristics of DC generators

**UNIT II - D.C. MOTORS**

DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

**UNIT III- TRANSFORMERS**

Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit

**UNIT IV - PERFORMANCE OF TRANSFORMERS**

Losses and Efficiency of transformer and Regulation – OC and SC tests – Predetermination of efficiency and regulation (Simple Problems).

**UNIT V - THREE PHASE INDUCTION MOTOR**

Principle of operation of three-phase induction motors – Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

**UNIT VI - ALTERNATORS**

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

**UNIT VII - SINGLE PHASE INDUCTION MOTORS**

Principle of operation - Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

**UNIT VIII - ELECTRICAL INSTRUMENTS**

Basic Principles of indicating instruments – Moving Coil and Moving Iron Instruments (Ammeters and Voltmeters).

**TEXT BOOKS**

1. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshiah, TMH Publ.

2. Basic Electrical Engineering - T.K. Nagasarkar and M.S.Sukhija, Oxford University Press, 2005

**REFERENCES**

- Principles of Electrical Engineering - V.K Mehta, S.Chand Publications.
- Theory and Problems of basic electrical engineering - I.J. Nagarath and D.P Kothari, PHI Publications
- Essentials of Electrical and Computer Engineering - David V. Kerns, JR. J. David Irwin

**(EI05206) ELECTROMAGNETIC WAVES AND TRANSMISSION LINES****UNIT I****ELECTROSTATICS [1]**

Coulomb's Law, Electric Field Intensity – Fields due to Different Charge Distributions, Electric Flux Density, Gauss Law and Applications, Electric Potential, Relations Between E and V, Maxwell's Two Equations for Electrostatic Fields, Energy Density, Related Problems. Convection and Conduction Currents, Dielectric Constant, Isotropic and Homogeneous Dielectrics, Continuity Equation, Relaxation Time, Poisson's and Laplace's Equations; Capacitance – Parallel Plate, Coaxial, Spherical Capacitors, Related Problems.

**UNIT II****Magneto Statics [1]**

Biot-Savart Law, Ampere's Circuital Law and Applications, Magnetic Flux Density, Maxwell's Two Equations for Magnetostatic Fields, Magnetic Scalar and Vector Potentials, Forces due to Magnetic Fields, Ampere's Force Law, Inductances and Magnetic Energy. Related Problems.

**UNIT III****Maxwell's Equations (Time Varying Fields) [2]**

Faraday's Law and Transformer emf, Inconsistency of Ampere's Law and Displacement Current Density, Maxwell's Equations in Different Final Forms and Word Statements. Conditions at a Boundary Surface : Dielectric-Dielectric and Dielectric-Conductor Interfaces. Related Problems [2,1].

**UNIT IV****EM Wave Characteristics - I [2]**

Wave Equations for Conducting and Perfect Dielectric Media, Uniform Plane Waves – Definition, All Relations Between E & H. Sinusoidal Variations. Wave Propagation in Lossless and Conducting Media. Conductors & Dielectrics – Characterization, Wave Propagation in Good Conductors and Good Dielectrics. Polarization. Related Problems.

**UNIT V**

EM Wave Characteristics – II [2]

Reflection and Refraction of Plane Waves – Normal and Oblique Incidences, for both Perfect Conductor and Perfect Dielectrics, Brewster Angle, Critical Angle and Total Internal Reflection, Surface Impedance, Poynting Vector and Poynting Theorem – Applications, Power Loss in a Plane Conductor. Related Problems [2, 1].

**UNIT V**

Guided Waves

Parallel Plane Waveguides [2] : Introduction, TE, TM, TEM Modes - Concepts and Analysis, Cut-off Frequencies, Velocities, Wavelengths, Wave Impedances, Attenuations Factor – Expression for TEM Case. Related Problems.

**UNIT VII**

Transmission Lines - I

Types, Parameters, Transmission Line Equations, Primary & Secondary Constants, Expressions for Characteristic Impedance, Propagation Constant, Phase and Group Velocities, Infinite Line Concepts, Losslessness/Low Loss Characterization, Distortion – Condition for Distortionlessness and Minimum Attenuation, Loading - Types of Loading. Related Problems.

**UNIT VIII**

Transmission Lines – II

Input Impedance Relations, SC and OC Lines, Reflection Coefficient, VSWR. UHF Lines as Circuit

Elements;  $\lambda/4$ ,  $\lambda/2$ ,  $\lambda/8$  Lines – Impedance Transformations. Smith Chart – Configuration and Applications, Single and Double Stub Matching. Related Problems.

**TEXT BOOKS:**

1. Elements of Electromagnetics – Matthew N.O. Sadiku, Oxford Univ. Press, 3<sup>rd</sup> ed., 2001.
2. Electromagnetic Waves and Radiating Systems – E.C. Jordan and K.G. Balmain, PHI, 2<sup>nd</sup> Edition, 2000.

**REFERENCES :**

1. Engineering Electromagnetics – Nathan Ida, Springer (India) Pvt. Ltd., New Delhi, 2<sup>nd</sup> ed., 2005.
2. Networks, Lines and Fields – John D. Ryder, PHI, 2<sup>nd</sup> ed., 1999, Engineering Electromagnetics – William H. Hayt Jr. and John A. Buck, TMH, 7<sup>th</sup> ed., 2006.
3. Electromagnetic Field Theory and Transmission Lines – G.S.N. Raju, Pearson Edn. Pvt. Ltd., 2005.
4. Transmission Lines and Networks – Umesh Sinha, Satya Prakashan (Tech. India Publications), New Delhi, 2001.

IInd Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4**(EC05517) SIGNALS AND SYSTEMS****UNIT I**

SIGNAL ANALYSIS

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

**UNIT II**

FOURIER SERIES REPRESENTATION OF PERIODIC SIGNALS

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

**UNIT III**

FOURIER TRANSFORMS

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

**UNIT IV**

SIGNAL TRANSMISSION THROUGH LINEAR SYSTEMS

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

**UNIT V**

CONVOLUTION AND CORRELATION OF SIGNALS

Concept of convolution in time domain and frequency domain, Graphical representation of convolution, Convolution property of Fourier transforms. Cross correlation and auto correlation of functions, properties of correlation function, Energy density spectrum, Parseval's theorem, Power density spectrum, Relation between auto correlation function and energy/power spectral density function, Relation between

convolution and correlation, Detection of periodic signals in the presence of noise by correlation, Extraction of signal from noise by filtering.

**UNIT VI****SAMPLING**

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

**UNIT VII****LAPLACE TRANSFORMS**

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

**UNIT VIII****Z-TRANSFORMS**

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

**TEXT BOOKS:**

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2<sup>nd</sup> Edn.

**REFERENCES**

1. Signals & Systems - Simon Haykin and Van Veen, Wiley, 2<sup>nd</sup> Edition.
2. Network Analysis - M.E. Van Valkenburg, PHI Publications, 3<sup>rd</sup> Edn., 2000.
3. Signals & Systems Analysis Using Transformation Methods & MAT Lab - Robert, TMH, 2003.
4. Signals, Systems and Transforms - C. L. Philips, J.M. Parr and Eve A. Riskin, Pearson education., 3<sup>rd</sup> Edition, 2004.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IInd Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4**(EC05497) PULSE AND DIGITAL CIRCUITS****UNIT I****LINEAR WAVESHAPING**

High pass, low pass RC circuits, their response for sinusoidal, step, pulse, square and ramp inputs. RC network as differentiator and integrator, attenuators, its applications in CRO probe, RL and RLC circuits and their response for step input, Ringing circuit.

**UNIT II****NON-LINEAR WAVE SHAPING**

Diode clippers, Transistor clippers, clipping at two independent levels, Transfer characteristics of clippers, Emitter coupled clipper, Comparators, applications of voltage comparators, clamping operation, clamping circuits using diode with different inputs, Clamping circuit theorem, practical clamping circuits, effect of diode characteristics on clamping voltage, Transfer characteristics of clampers.

**UNIT III****SWITCHING CHARACTERISTICS OF DEVICES**

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

**UNIT IV****MULTIVIBRATORS**

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

**UNIT V****TIME BASE GENERATORS**

General features of a time base signal, methods of generating time base waveform, Miller and Bootstrap time base generators – basic principles, Transistor miller time base generator, Transistor Bootstrap time base generator, Current time base generators.

**UNIT VI****SYNCHRONIZATION AND FREQUENCY DIVISION**

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

**UNIT VII****SAMPLING GATES**

Basic operating principles of sampling gates, Unidirectional and Bi-directional sampling gates, Reduction of pedestal in gate circuits, Applications of sampling gates.

**UNIT VIII****REALIZATION OF LOGIC GATES USING DIODES & TRANSISTORS**

AND, OR gates using Diodes, Resistor, Transistor Logic, Diode Transistor Logic.

**TEXT BOOKS:**

1. Pulse, Digital and Switching Waveforms - J. Millman and H. Taub, McGraw-Hill, 1991.
2. Solid State Pulse circuits - David A. Bell, PHI, 4<sup>th</sup> 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.

IInd Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4**(EE05539) SWITCHING THEORY AND LOGIC DESIGN****UNIT I****NUMBER SYSTEMS & CODES**

Philosophy of number systems – complement representation of negative numbers- binary arithmetic – binary codes – error detecting and error correcting codes – hamming codes.

**UNIT II****BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS**

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

**UNIT III****MINIMIZATION OF SWITCHING FUNCTIONS**

Map method, Prime implicants, Don't care combinations, Minimal SOP and POS forms, Tabular Method, Prime –Implicant chart, simplification rules

**UNIT IV****COMBINATIONAL LOGIC DESIGN**

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

**UNIT V****PROGRAMMABLE LOGIC DEVICES, THRESHOLD LOGIC**

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

**UNIT VI****SEQUENTIAL CIRCUITS - I**

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

**UNIT VII****SEQUENTIAL CIRCUITS - II**

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

**UNIT VIII****ALGORITHMIC STATE MACHINES**

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

**TEXT BOOKS:**

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

**REFERENCES**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IInd Year B.Tech. EIE (I Semester)

T P C  
0 3 2**(EEO5201) ELECTRICAL TECHNOLOGY LAB****PART – A**

Serial and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.

Time response of first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.

Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.

Verification of Superposition and Reciprocity theorems.

Verification of maximum power transfer theorem. Verification on DC, verification on AC with Resistive and Reactive loads.

Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.

**PART – B**

Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.

Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).

Brake test on DC shunt motor: Determination of performance characteristics. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).

Brake test on 3-phase Induction motor (performance characteristics). Regulation of alternator by synchronous impedance method.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IInd Year B.Tech. EIE (I Semester)

T P C  
0 3 2**(EC05498) PULSE AND DIGITAL CIRCUITS LAB.**

Minimum Twelve experiments to be conducted :

Linear wave shaping.

Non Linear wave shaping – Clippers.

Non Linear wave shaping – Clampers.

Transistor as a switch.

Study of Logic Gates &amp; Some applications.

Study of Flip-Flops &amp; some applications.

Sampling Gates.

Astable Multivibrator.

Monostable Multivibrator.

Bistable Multivibrator.

Schmitt Trigger.

UJT Relaxation Oscillator.

Bootstrap sweep circuit.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

II Year B.Tech. EIE - II Semester

T P C  
4+1 0 4**(HS05353) 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)-termination of Break-Even Point (simple problems)-Managerial Significance and Limitations of BEA.

**UNIT IV**

INTRODUCTION TO MARKETS &amp; 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 &amp; NEW ECONOMIC ENVIRONMENT

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

**UNIT VI****CAPITAL AND CAPITAL BUDGETING**

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

**UNIT VII****INTRODUCTION TO FINANCIAL ACCOUNTING**

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

**UNIT VIII****FINANCIAL ANALYSIS THROUGH RATIOS**

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

**TEXT BOOKS:**

1. Managerial Economics and Financial Analysis – Aryasri, TMH, 2/E, 2005.
2. Managerial Economics - Varshney & Maheswari, Sultan Chand, 2003.

**REFERENCES**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IInd Year B.Tech. EIE (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.



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

- Air pollution
- Water pollution
- Soil pollution
- Marine pollution
- Noise pollution
- Thermal pollution
- Nuclear hazards

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

#### UNIT - VI

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

#### UNIT - VII

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

#### UNIT - VIII

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

#### TEXTBOOK :

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

### (IC05111) CALIBRATION AND ELECTRONIC MEASUREMENTS

#### UNIT – I:

Introduction to measurements. Physical measurement. Forms and methods of measurements. Measurement errors. Statistical analysis of measurement data. Probability of errors. Limiting errors.

#### UNIT – II:

Standards. Definition of standard units. International standards. Primary standards. Secondary standards. Working standards. Voltage standard. Resistance standard. Current standard. Capacitance standard. Time and frequency standards.

#### UNIT – III:

Testing and calibration. Traceability. Measurement reliability. Calibration experiment and evaluation of results. Primary calibration. Secondary calibration. Direct calibration. Indirect calibration. Routine calibration. Calibration of a voltmeter, ammeter and an oscilloscope

#### UNIT - IV

Voltage and current measurements: DC & AC voltage measurements using Rectifier, Thermocouple & Electronic voltmeters, Ohm meter, Digital Voltmeters, Range Extension of Ammeters & Voltmeter.

#### UNIT – V

Bridges: AC Bridges – measurement of inductance. Maxwell's bridge. Anderson bridge, measurement of capacitance. Schering bridge, measurement of impedance – Kelvin's bridge, Wheat Stone bridge, HF bridges, problems of shielding. and grounding. Q-meter.

#### UNIT – VI

Frequency Counters: Basic Principle, errors associated with counter, Different modes of operations: Frequency, Time, Time Period, Average time period, Totalizing, Frequency synthesizer, Wave meters, Wave Analyzers, Output Power meter.

**UNIT – VII**

Oscilloscopes: CRO operation, CRT characteristics, probes, Time base sweep modes, Trigger generator, Vertical amplifier, modes of operation, A, B, alternate & chop modes, sampling oscilloscopes, storage oscilloscope, Standard specifications of CRO, Synchronous selector circuits.

**Unit – VIII**

Spectrum analyzers, Different types of spectrum analyzer, Recorders, Introduction to magnetic recording techniques & X-Y plotters. Display Devices and Display Systems, Logic Analyzers – State & time referenced data capture.

**TEXT BOOKS:**

1. Electronic Instrumentation – HS Kalsi, Tata Mc Graw Hill, 2004..
2. John P. Bentley: Principles of measurement systems, 3rd edition, Addison Wesley Longman, 2000.

**REFERENCES:**

1. Electronic Instrumentation & Measurement Techniques – by W.D. Cooper, PHIAIan S. Morris: Principles of measurement and instrumentation, 2nd edition, Prentice-Hall of India, 2004.
2. Measuring Systems, Application and Design – by E. O. Doebelin, McGraw Hill.
3. Electrical and Electronic Measurements – by Shawney, Khanna Publ.
4. Electronic Instrumentation and measurements – by David A. Bell, 2<sup>nd</sup> Edition, PHI, 2003.
5. M.M.S. Anand: Electronic instruments and instrumentation Technology, Prentice-Hall of India, 2004.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

II Year B.Tech. EIE - II Semester

T P C  
4+1 0 4**(EE05149) CONTROL SYSTEMS****UNIT I****INTRODUCTION**

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

**UNIT II****TRANSFER FUNCTION REPRESENTATION**

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

**UNIT III****TIME RESPONSE ANALYSIS**

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

**UNIT IV****STABILITY ANALYSIS IN S-DOMAIN**

The concept of stability - Routh stability criterion – qualitative stability and conditional stability

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

**UNIT V****FREQUENCY RESPONSE ANALYSIS**

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

**UNIT VI****STABILITY ANALYSIS IN FREQUENCY DOMAIN**

Polar Plots, Nyquist Plots and applications of Nyquist criterion to find the stability – Effects of adding poles and zeros to  $G(s)H(s)$  on the shape of the Nyquist diagrams.

**UNIT VII****CLASSICAL CONTROL DESIGN TECHNIQUES**

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

**UNIT VIII****State Space Analysis of Continuous Systems**

Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalization- Solving the Time invariant state Equations- State Transition Matrix and its Properties

**TEXT BOOKS:**

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

**REFERENCES**

1. Control Systems - N.K.Sinha, New Age International (P) Limited Publishers, 3<sup>rd</sup> Edition, 1998.
2. Automatic Control Systems - B. C. Kuo, John wiley and son's., 8th edition, 2003.
3. Control Systems Engg. – NISE, John wiley, 3<sup>rd</sup> Edition.
4. Modelling & Control Of Dynamic Systems - Narciso F. Macia George J. Thaler, Thomson Publishers.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

**II Year B.Tech. EIE - II Semester****T P C  
4+1 0 4****(EC05344) LINEAR IC APPLICATIONS****UNIT I****INTEGRATED CIRCUITS**

Differential Amplifier- DC and AC analysis of Dual Input Balanced output Configuration, Properties of other differential amplifier configuration (Dual Input Unbalanced Output, Single Ended Input – Balanced/ Unbalanced Output), DC Coupling and Cascade Differential Amplifier Stages, Level translator.

**UNIT II**

Characteristics of OP-Amps, Integrated circuits- Types, Classification, Package Types and temperature ranges, Power supplies, Op-amp Block Diagram, ideal and practical Op-amp specifications. DC and AC characteristics, 741 op-amp and its features, FET input. Op-Amps, Op-Amp parameters & Measurement, Input and Output Off set voltages and currents, slew rates, CMRR, PSRR, drift, Frequency Compensation technique.

**UNIT III****LINEAR APPLICATIONS OF OP- AMPS**

Inverting and Non-inverting amplifier, Integrator and differentiator, Difference amplifier, Instrumentation amplifier, AC amplifier, V to I, I to V converters, Buffers.

**UNIT IV****NON-LINEAR APPLICATIONS OF OP- AMPS**

Non- Linear function generation, Comparators, Multivibrators, Triangular and Square wave generators, Log and Anti log amplifiers, Precision rectifiers.

**UNIT V****OSCILLATORS AND WAVEFORM GENERATORS:**

Introduction, Butter worth filters – 1st order, 2<sup>nd</sup> order LPF, HPF filters. Band pass, Band reject and all pass filters. Applications of VCO (566)

## UNIT VI

## TIMERS &amp; 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, 565 PLL, Applications of PLL – frequency multiplication, frequency translation, AM, FM & FSK demodulators.

## UNIT VII

## D to A &amp; A to D CONVERTERS

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

## UNIT VIII

## ANALOG MULTIPLIERS AND MODULATORS

Four Quadrant multiplier, balanced modulator, IC 1496, Applications of analog switches and Multiplexers, Sample & Hold amplifiers.

## TEXT BOOKS:

1. Linear Integrated Circuits – D. Roy Chowdhury, New Age International (p) Ltd, 2<sup>nd</sup> Edition, 2003.
2. Op-Amps & Linear ICs - Ramakanth A. Gayakwad, PHI, 1987.

## REFERENCES:

1. Design with Operational Amplifiers and Analog Integrated Circuits - Sergio Franco, McGraw Hill, 1988.
2. Operational Amplifiers and Linear Integrated Circuits – R.F. Coughlin and Fredrick Driscoll, PHI, 6<sup>th</sup> Edition.
3. Micro Electronics – Millman, McGraw Hill, 1988.
4. Operational Amplifiers – C.G. Clayton, Butterworth & Company Publ. Ltd/ Elsevier, 1971.
5. Linear Integrated Applications by K. Lal Kishore, Pearson Education - 2005

II Year B.Tech. EIE - II Semester

T P C  
4+1 0 4

**(EI05516) SENSORS AND SIGNAL CONDITIONING**

## UNIT1:

**Introduction to measurement systems:** general concepts and terminology, measurement systems, sensor classification, general input-output configuration, methods of correction **performance characteristics:** static characteristics of measurement systems, accuracy, precision, sensitivity, other characteristics: linearity, resolution, systematic errors, random errors, dynamic characteristics of measurement systems: zero-order, first-order, and second-order measurement systems and response

## UNIT2:

**Resistive sensors:** potentiometers, strain gages and types, resistive temperature detectors (rtds), thermistors, magneto resistors, light-dependent resistors (ldrs)

## UNIT3:

**Signal conditioning for resistive sensors:** measurement of resistance, voltage dividers, Wheatstone bridge. Balance and deflection measurements, sensor bridge calibration and compensation instrumentation amplifiers, interference types and reduction

## UNIT4:

**Reactance variation and electromagnetic sensors :** capacitive sensors - variable & differential, inductive sensors - reluctance variation, eddy current, linear variable differential transformers (lvdt's), variable transformers: synchros, resolvers, inductosyn, magneto elastic sensors, electromagnetic sensors - sensors based on faraday's law, hall effect sensors

## UNIT5:

**Signal conditioning for reactance variation sensors :** problems and alternatives, ac bridges, carrier amplifiers - application to the lvdt, variable oscillators, resolver-to-digital and digital-to-resolver converters

## UNIT6:

**Self-generating sensors:** thermoelectric sensors, piezoelectric sensors, pyroelectric sensors, photovoltaic sensors, electrochemical sensors

**UNIT7:**

**Signal conditioning for self-generating sensors:** chopper and low-drift amplifiers, offset and drifts amplifiers , electrometer amplifiers, charge amplifiers, noise in amplifiers

**UNIT8:**

**Digital sensors:** position encoders, variable frequency sensors - quartz digital thermometer, vibrating wire strain gages , vibrating cylinder sensors, saw sensors, digital flow meters, Sensors based on semiconductor junctions : thermometers based on semiconductor junctions, magneto diodes and magneto transistors, photodiodes and phototransistors, sensors based on mosfet transistors, charge-coupled sensors - types of ccd imaging sensors , ultrasonic-based sensors , fiber-optic sensors

**TEXT BOOK:**

1. Sensors and Signal Conditioning : Ramon Pallás Areny, John G. Webster, 2nd edition, John Wiley and Sons, 2000.
2. Sensors and Transducers – D.Patranabis, TMH 2003

**REFERENCES:**

1. Sensor Technology Handbook – Jon Wilson, Newne 2004.
2. Instrument Transducers – An Introduction to Their Performance and Design – by Herman K.P. Neubrat, Oxford University Press.
3. Measurement System : Applications and Design – by E.O. Doebelin, McGraw Hill Publications.
4. Process Control Instrumentation Technology – D. Johnson, John Wiley and Sons

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IInd Year B.Tech. EIE (II Semester)

T P C  
0 3 2**(EC05345) LINEAR IC APPLICATIONS LAB.**

Minimum Twelve Experiments to be conducted :

Study of OP AMPs – IC 741, IC 555, IC 565, IC 566, IC 1496 – functioning, parameters and Specifications.

OP AMP Applications – Adder, Subtractor, Comparator Circuits.

Integrator and Differentiator Circuits using IC 741.

Active Filter Applications – LPF, HPF (first order)

Active Filter Applications – BPF, Band Reject (Wideband) and Notch Filters.

IC 741 Oscillator Circuits – Phase Shift and Wien Bridge Oscillators.

Function Generator using OP AMPs.

IC 555 Timer – Monostable Operation Circuit.

IC 555 Timer – Astable Operation Circuit.

Schmitt Trigger Circuits – using IC 741 and IC 555.

IC 565 – PLL Applications.

IC 566 – VCO Applications.

Voltage Regulator using IC 723.

Three Terminal Voltage Regulators – 7805, 7809, 7912.

4 bit DAC using OP AMP.

**(EI05329) INSTRUMENTATION LAB – I**

(Minimum 10 experiments should be conducted)

DC meters using D' Arson Val Galvanometers.

AC meters using D' Arson Val Galvanometers.

Ohm meter.

RLC and Q measurement using Q – meter.

Study of CRO – Voltage, frequency and phase measurement.

Strain gauges.

Resistance Thermometer Devices.

LVDT.

Capacitive transducers.

Piezoelectric Transducers.

Bourdon tube.

Acceleration transducer.

**(HS05352) MANAGEMENT SCIENCE****UNIT I****INTRODUCTION TO MANAGEMENT**

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

**UNIT II****DESIGNING ORGANISATIONAL STRUCTURES**

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

**UNIT III****OPERATIONS MANAGEMENT**

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

**UNIT IV****MATERIALS MANAGEMENT**

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

**UNIT 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.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B. Tech. EIE (I Semester)

**T P C**  
4+1 0 4

**(CS05140) COMPUTER ORGANIZATION**

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

**UNIT VII**

**STRATEGIC MANAGEMENT**

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

**UNIT VIII**

**CONTEMPORARY MANAGEMENT PRACTICES**

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

**TEXT BOOKS:**

1. Management Science – Aiyasri, TMH, 2004.
2. Management - Stoner, Freeman, Gilbert, Pearson Education, New Delhi, 6<sup>th</sup> Ed., 2004.

**REFERENCES**

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

**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 Micro-operations, logic micro operations, shift micro operations, Arithmetic logic shift unit. Instruction codes. Computer Registers Computer instructions – Instruction cycle.  
Memory – Reference Instructions. Input – Output and Interrupt. STACK organization. Instruction formats. Addressing modes. DATA Transfer and manipulation. Program control. Reduced Instruction set computer

**UNIT III**

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

**UNIT IV**

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

**UNIT V**

THE MEMORY SYSTEM: 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, Inter processor Arbitration. Inter Processor Communication and Synchronization Cache Coherence. Shared Memory Multiprocessors.

**TEXT BOOKS**

1. Computer Systems Architecture – M.Moris Mano, 11<sup>th</sup> Edition, PHI/Pearson.
2. Computer Organization – Car Hamacher, Zvonks Vranasic, Sateazaky, 1<sup>th</sup> Edition, McGraw Hill.

**REFERENCES**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

11<sup>th</sup>rd Year B. Tech. EIE (I Semester)T P C  
4+1 0 4**(EC05172) DIGITAL IC APPLICATIONS****UNIT I****CMOS LOGIC**

Introduction to logic families, CMOS logic, CMOS steady state electrical behavior, CMOS dynamic electrical behavior, CMOS logic families.

**UNIT II****BIPOLAR LOGIC AND INTERFACING**

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

**UNIT III****THE VHDL HARDWARE DESCRIPTION LANGUAGE**

Design flow, program structure, types and constants, functions and procedures, libraries and packages.

**UNIT IV****THE VHDL DESIGN ELEMENTS**

Structural design elements, data flow design elements, behavioral design elements, time dimension and simulation synthesis.

**UNIT V****COMBINATIONAL LOGIC DESIGN**

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

**UNIT VI****DESIGN EXAMPLES (USING VHDL)**

Design examples (using VHDL) - Barrel shifter, comparators, floating-point encoder, dual parity encoder.



## UNIT VII

## SEQUENTIAL LOGIC DESIGN

Latches and flip-flops, PLDs, counters, shift register, and their VHDL models, synchronous design methodology, impediments to synchronous design.

## UNIT VIII

## MEMORIES

ROMs: Internal structure, 2D-decoding commercial types, timing and applications.  
Static RAM: Internal structure, SRAM timing, standard SRAMS, synchronous SRAMS.

Dynamic RAM: Internal structure, timing, synchronous DRAMS. Familiarity with Component Data Sheets – Cypress CY6116,CY7C1006, Specifications.

## TEXT BOOKS:

1. Digital Design Principles and Practices – John F. Wakerly, PHI/ Pearson Education Asia, 3<sup>rd</sup> Ed., 2005.
2. VHDL Primer – J. Bhasker, Pearson Education/ PHI,3<sup>rd</sup> Edition.

## REFERENCES :

1. Digital System Design Using VHDL – Charles H. Roth Jr., PWS Publications,1998.
2. Introduction to Logic Design – Alan B. Marcovitz,TMH,2<sup>nd</sup> Edition,2005.
3. Fundamentals of Digital Logic with Verilog Design – Stephen Brown, Zvonko Vranesic, TMH, 2003.
4. Cypress Semiconductors Data Book(Download from website).
5. Fundamentals of Digital Logic with VHDL Design – Stephen Borwn and Zvonko Vranesic, McGraw Hill,2<sup>nd</sup> Edition.,2005.

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD

III<sup>rd</sup> Year B.Tech. EIE (I Semester)T P C  
4+1 0 4

## (CS05435) OPERATING SYSTEMS

## UNIT – I:

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

## UNIT- II:

**Process Description** – Process Control –Process States- Process and Threads - Examples of Process description and Control.

## UNIT- III:

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

## UNIT- IV:

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

## UNIT – V:

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

## UNIT – VI:

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

## UNIT – VII:

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

## UNIT – VIII:

**Security:** Security threats – Protection – Intruders – Viruses – trusted System.

## TEXT BOOKS:

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

## REFERENCES:

1. Operating System A Design Approach-Crowley,TMH.
2. Modern Operating Systems, Andrew S tanenbaum 2<sup>nd</sup> edition Pearson/PHI

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4**(EI05309) INDUSTRIAL INSTRUMENTATION****UNIT – I: METROLOGY**

Measurement of length – Plainness – Area – Diameter – Roughness – Angle – Comparators – Gauge blocks – Optical Methods of length and distance measurements.

**UNIT – II: VELOCITY AND ACCELERATION MEASUREMENT**

Relative velocity – Translational and Rotational velocity measurement – Revolution counters and Timers - Magnetic and Photoelectric pulse counting stroboscopic methods - Accelerometers of different types - Gyroscopes.

**UNIT – III: FORCE AND TORQUE MEASUREMENT**

Force measurement – Different methods –Torque measurement – Dynamometers- Gyroscopic Force and Torque Measurement – Vibrating wire Force transducer

**UNIT – IV: PRESSURE MEASUREMENT**

Basics of Pressure measurement – Deadweight Gages and Manometers types – Force-Balance and Vibrating Cylinder Transducers – High and Low Pressure measurement – McLeod Gage, Knudsen Gage, Momentum Transfer Gages, Thermal Conductivity Gages, Ionization Gages, Dual Gage Techniques.

**UNIT – V: FLOW MEASUREMENT**

Head type, Area type (Rota meter), electromagnetic type, Positive displacement type, mass flow meter, ultrasonic type ,vertex shedding type, Hotwire anemometer type.. Laser Doppler Veloci-meter.

**UNIT – VI: DENSITY MEASUREMENT**

Volume Flow meter Plus Density measurement – Strain Gauge load cell method – Buoyancy method - Air pressure balance method – Gamma ray method – Vibrating probe method. Direct Mass Flow meters.

**UNIT – VII: RADIATION MEASUREMENT**

Radiation Fundamentals. Radiation Detectors. Radiation Thermometers. Optical Pyrometers.

**UNIT – VIII: OTHER MEASUREMENTS**

Sound-Level Meter. Microphones. Time, Frequency, and Phase-Angle measurement. Liquid Level. Humidity. Chemical Composition. Particle Instruments and Clean-Room Technology.

**TEXT BOOKS:**

1. Measurement Systems – Applications and Design – by Doebelin E.O., 4/e, McGraw Hill International, 1990.
2. Principles of Industrial Instrumentation – Patranabis D. TMH. End edition 1997

**REFERENCES:**

1. Process Instruments and Control Handbook – by Considine D.M., 4/e, McGraw Hill International, 1993.
2. Mechanical and Industrial Measurements – by Jain R.K., Khanna Publishers, 1986.
3. Instrument Technology, vol. I – by Jones E.B., Butterworths, 1981.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4

**(IC05479) PROCESS CONTROL INSTRUMENTATION**

**UNIT – I:**

**PROCESS DYNAMICS**

Process variables – Load variables – Dynamics of simple pressure, flow level and temperature process – interacting and non-interacting systems – continuous and batch process – self-regulation – Servo and Regulator operation - problems.

**UNIT – II:**

**CONTROL ACTIONS AND CONTROLLERS**

Basic control actions – characteristics of two position, three position, Proportional, Single speed floating, Integral and Derivative control modes – PI, PD, PID control modes – Problems –

**UNIT – III:**

**TYPES OF CONTROLLERS**

Pneumatic, Hydraulic and Electronic Controllers to realize various control actions.

**UNIT – IV:**

**CONTROLLER SETTINGS**

Evaluation criteria –  $1/4^{\text{th}}$  decay ratio, IEA, ISE, ITAE - determination of optimum settings for mathematically described process using time response and frequency response.

**UNIT – V:**

**TUNING OF CONTROLLERS**

Tuning process curve reaction method – continuous oscillation method – damped oscillation method – problems.

**UNIT – VI:**

**FINAL CONTROL ELEMENTS**

I/P Converter , P/I converter - pneumatic, electric and hydraulic actuators – valve positioner

**UNIT – VII:**

**CONTROL VALVES**

Control valves – characteristic of control valves – valve body – Globe, Butterfly, diaphragm, Ball valves – Control valve sizing – Cavitations, flashing - problems.

**UNIT – VIII:**

**MULTILOOP CONTROL SYSTEM**

Feed forward control – Ratio control – Cascade control – Split range – Multivariable control and examples from distillation column and Boiler system.

**TEXT BOOKS :**

1. Chemical Process Control : An introduction to Theory and Practice – by Stephanopoulos, Prentice Hall, New Delhi, 1999.
2. Process Control – Harriott P., TMH, 1991

**REFERENCES:**

1. Process Control, Third Edition – Liptak B.G., Chilton Book Company, Pennsylvania, 1995
2. Process control – by Pollard A., Heinemann Educational Books, London, 1971.
3. Automatic Process Control – by Eckman D.P., Wiley Eastern Ltd., New Delhi, 1993.
4. Process Control – by Patranabis.
5. Process System Analysis and Control – Coughanowr, McGraw Hill, Singapore, 1991

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B. Tech. EIE (I Semester)

T P C  
0 3 2

**(CS05209) ELECTRONICS COMPUTER AIDED DESIGN LAB.**

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

- Gates.
- D Flip-Flop 7474.
- Decade counter – 7490.
- 4 Bit counter – 7493.
- Shift registers – 7495.
- Universal shift registers – 74194/195.
- 3 – 8 Decoder – 74138.
- 4 Bit Comparator – 7485.
- 8 x 1 Multiplexer – 74151 and 2X4 Demultiplexer - 74155
- 16 x 1 Multiplexer – 74150 and 4X16 Demultiplexer - 74154
- RAM (16 x 4) – 74189 (Read and Write operations).
- 12.Stack and Queue Implementation using RAM.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B. Tech. EIE (I Semester)

T P C  
0 3 2

**(IC05480) PROCESS CONTROL LAB**

(Minimum 10 experiments should be conducted)

1. Flow level control unit.
2. Temperature level control unit.
3. Servo and regulator operation.
4. Realization of control actions: Pneumatic controllers. Hydraulic controllers.
5. Electronic controllers.
6. Process tuning – Process reaction curve method.
7. Process tuning – continuous and damped oscillation method.
8. Operation of flow loop in plant.
9. Input convertor – Pneumatic actuator.
10. Input convertor – Hydraulic actuator.
11. Control valve characteristics (Different types).
12. Multi loop control systems – Ratio Control.
13. Multi loop control systems – Cascade Control.

**(EI05055) AUTOMATION OF INDUSTRIAL PROCESSES****UNIT – I:****INTRODUCTION TO COMPUTER CONTROL**

Role of computers in the control of Industrial processes (plants). Elements of Computer Controlled Process / Plant. Classification – Batch, Continuous, Supervisory and Direct Digital Controls. Architecture – Centralized, Distributed and Hierarchical Systems. Man Machine or Human Computer Interface (HCI).

**UNIT – II:****BUILDING BLOCKS**

Process Control Requirements of Computers. Process related variables. Computer Network. Communications in Distributed control Systems. Smart Sensors and Field bus.

**UNIT – III:****CONTROL SYSTEM DESIGN -I**

Control System Design – Heuristics, Structural Controllability and Relative Gain Array. Controller Design – Regulator design and other design considerations. Controller Tuning – P, PI, PID, and Ziegler-Nicholas method. Computer aided Control System Design.

**UNIT – IV:****CONTROL SYSTEM DESIGN -II**

Computer control loop, Modified Z – Transform, Zero-order hold equivalence, First order system with time delay, Converting continuous time controller to discrete time domain, Design of controllers based on discrete time model – Deadbeat and Dahlin's algorithms.

**UNIT – V:****DESIGN OF FEED FORWARD CONTROLLER**

Block Diagram, Feed Forward control algorithms – dynamic, static, Deadbeat

**UNIT – VI:****CASCADE, PREDICTIVE AND ADAPTIVE CONTROL**

Cascade Control – Dynamic response, Types, Implementation. Predictive Control – Model based and Multivariable System. Adaptive Control – Adjustment, Schemes, and Techniques.

**UNIT – VII:****ADVANCED STRATEGIES**

Inferential Control. Intelligent Control. Statistical Process Control. Algorithms for Processes with Dead Time – Smith Predictor (SP), Analytical Predictor (AP). Optimal Control

**UNIT – VIII:****DISTRIBUTED DIGITAL CONTROL**

Programmable logic controllers (PLC)- Architecture, Selection. Overview of Distributed Digital Control System (DCS). DCS Software configuration. DCS Communication – Data Highway. DCS Supervisory computer Tasks. DCS Integration with PLCs and Computers.

**TEXT BOOKS:**

1. Computer Aided Process Control – S.K.Singh. PHI 2004
2. Computer Control of Processes – M.Chidambaram. Narosa 2003.

**REFERENCES:**

1. Computer-based Industrial Control by Krishna Kanth. PHI 1997
2. Real Time Control: An Introduction – second edition - S.Bennett, Pearson Education India 2003.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
**HYDERABAD.**  
**IIIrd Year B.Tech. EIE (II Semester)**  
**T P C**  
**4+1 0 4**  
**(EC05400) MICROPROCESSORS AND INTERFACING**

**UNIT I**

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

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

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

**UNIT V**

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

**UNIT VI**

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

**UNIT VII**

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

**UNIT VIII**

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

**TEXT BOOKS:**

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

**REFERENCES :**

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

## JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

### (EC05176) DIGITAL SIGNAL PROCESSING

#### UNIT I

##### INTRODUCTION

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

#### UNIT II

##### DISCRETE FOURIER SERIES

Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete Fourier transforms: Properties of DFT, linear convolution of sequences using DFT, Computation of DFT.

#### UNIT III

##### FAST FOURIER TRANSFORMS

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

#### UNIT IV

##### REALIZATION OF DIGITAL FILTERS

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

#### UNIT V

##### IIR DIGITAL FILTERS

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

#### UNIT VI

##### FIR DIGITAL FILTERS

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

#### UNIT VII

##### MULTIRATE DIGITAL SIGNAL PROCESSING

Decimation, interpolation, sampling rate conversion, filter design and implementation for sampling rate conversion.

#### UNIT VIII

##### INTRODUCTION TO DSP PROCESSORS

Introduction to programmable DSPs: Multiplier and Multiplier Accumulator (MAC), Modified Bus Structures and Memory Access schemes in DSPs Multiple access memory, Multipoint 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:

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

##### REFERENCES

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(EC05471) PRINCIPLES OF COMMUNICATIONS**

**UNIT I**

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

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

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

**UNIT V**

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

**UNIT VI**

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

**UNIT VII**

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

**UNIT VIII**

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

**TEXT BOOKS:**

1. Communication Systems Analog and Digital – R.P. Singh and SD Sapre, TMH, 20<sup>th</sup> reprint, 2004.

2. Principles of Communications – H. Taub and D. Schilling, TMH, 2003.

**REFERENCES**

1. Electronic Communication Systems – Kennedy and Davis, TMH, 4<sup>th</sup> edition, 2004.

2. Communication Systems Engineering – John. G. Proakis and Masoud Salehi, PHI, 2<sup>nd</sup> Ed. 2004.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(IC05440) OPTOELECTRONIC & LASER INSTRUMENTATION**

**UNIT – I:**

**OPTICAL FIBERS AND THEIR PROPERTIES**

Introduction to optical fibers – Light guidance – Numerical aperture – Dispersion – Different types of fibers and their properties.

**UNIT – II:**

Light Sources for fiber optics, Photo detectors, source coupling, splicing and connectors.

**UNIT – III:**

**LASER FUNDAMENTALS**

Laser configuration – Q-Switching – Mode locking – Different types of Lasers – Ruby, Nd-Yag, He-Ne, CO<sub>2</sub>, Orgon ion.

**UNIT – IV:**

**FIBER OPTIC SENSORS**

IR sources and detectors – Interferometer method of measurement of length – Moire fringes – Measurement of pressure, Temperature, Current, Voltage, Liquid level and strain - fiber optic Gyroscope – Polarization maintaining fibers – Applications.

**UNIT – V:**

**LASER INSTRUMENTATION**

Industrial applications of lasers – Bio-medical application – Laser Doppler velocity meter – Laser heating

**UNIT – VI:**

**HOLOGRAPHY:** Principle, Methods, Holographic Interferometers and applications.

**UNIT – VII:**

**MEDICAL APPLICATIONS:** Lasers and tissue interaction, Laser instruments for surgery, removal tumors of vocal cords, plastic surgery, DERMATOLOGY.



**UNIT – VIII:****OPTO-ELECTRONIC COMPONENTS**

LED, LD, PIN & APD, Electro-optic, Magneto optic and Acousto-optic Modulators.

**TEXT BOOKS:**

1. An Introduction to Optical fibers.- Allen H.C. McGraw Hill, Singapore, 1993
2. Optics – A.K. Ghatak, Second edition, Tata McGraw Hill, New Delhi, 1992.

**REFERENCES**

1. Lasers : Theory and Applications – by Thyagarajan K. and Ghatak A.K., Plenum Press, New York.
2. Lasers and Optical Engineering – by Das P., Springers International Students Edition, 1991.
3. Optical Electronics – by Ghatak A.K. and Thyagarajan K., Foundation Books, 1991.
4. Laser and Applications – by Guimarrass W.O.N. and Mooradian A., Springer Verlag, 1981.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T	P	C
4+1	0	4

**(EI05090) BIO-MEDICAL INSTRUMENTATION****UNIT – I:**

Components of Medical Instrumentation System. Bioamplifier. Static and dynamic characteristics of medical instruments. Biosignals and characteristics. Problems encountered with measurements from human beings.

**UNIT – II:**

Organisation of cell. Derivation of Nernst equation for membrane Resting Potential Generation and Propagation of Action Potential, Conduction through nerve to neuromuscular junction.

**UNIT – III:**

Bio Electrodes – Biopotential Electrodes-External electrodes, Internal Electrodes. Biochemical Electrodes.

**UNIT – IV:**

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

**UNIT – V:**

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

**UNIT – VI:**

Therapeutic equipment.: Pacemaker, Defibrillator, Shortwave diathermy. Hemodialysis machine.

**UNIT – VII:**

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

**UNIT – VIII:**

Respiratory Instrumentation: Mechanism of respiration, Spirometry, Pneumotachograph Ventilators.

**TEXT BOOKS:**

1. Biomedical Instrumentation and Measurements – by Leslie Cromwell, F.J. Weibell, E.A. Pfeiffer, PHI.
2. Medical Instrumentation, Application and Design – by John G. Webster, John Wiley.

**REFERENCES:**

1. Principles of Applied Biomedical Instrumentation – by L.A. Geoddes and L.E. Baker, John Wiley and Sons.
2. Hand-book of Biomedical Instrumentation – by R.S. Khandpur, McGraw-Hill, 2003.
3. Biomedical Telemetry – by Mackay, Stuart R., John Wiley.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T P C  
0 3 2

**(EC05401) MICROPROCESSORS LAB**

1. Microprocessor 8086

**Introduction to MASM/TASM.**

2. 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.  
DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

**II. Interfacing**

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

**III. Microcontroller 8051**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD.

IIIrd Year B.Tech. EIE (II Semester)

T P C  
0 3 2

**(EI05330) INSTRUMENTATION LAB – II**

(Minimum of ten experiments should be conducted.)

Design and simulation of Analog Circuits using CAD Package.  
Design of PCBs using Packages and Fabrication of PCB.  
Linearization of Thermistor using Microprocessor.  
Study of Level monitoring Instruments using PLC.  
pH measurements.  
Measurement of Blood Pressure.  
Calibration of P to I and I to P converters.  
RPM indicator using Strobostrom/Gyroscope.  
Measurement of Humidity.  
Measurement of velocity of liquid using Ultrasonic (Doppler effect) method and also flow measurement.  
Measurement of Level using Capacitance method/Transducer.  
Displacement measurement using inductive pickup and capacitive pickup.  
PID Controller setup (Flow/Temp. Level).

**(EC05574) VLSI DESIGN****UNIT I****INTRODUCTION**

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

**UNIT II****BASIC ELECTRICAL PROPERTIES**

Basic Electrical Properties of MOS and BiCMOS Circuits:  $I_{ds}$ - $V_{ds}$  relationships, MOS transistor threshold Voltage, gm, gds, figure of merit  $Co$ ; 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 - t - Delays, Driving large Capacitive Loads, Wiring Capacitances, Fan-in and fan-out, Choice of layers

**UNIT V****SUBSYSTEM DESIGN**

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

**UNIT VI****SEMICONDUCTOR INTEGRATED CIRCUIT DESIGN**

PLAs, FPGAs, CPLDs, Standard Cells, Programmable Array Logic, Design Approach.

**UNIT VII****VHDL SYNTHESIS**

VHDL Synthesis, Circuit Design Flow, Circuit Synthesis, Simulation, Layout, Design capture tools, Design Verification Tools, Test Principles.

**UNIT VIII****CMOS TESTING**

CMOS Testing: Need for testing, Test Principles, Design Strategies for test, Chip-level Test Techniques, System-level Test Techniques, Layout Design for Improved Testability.

**TEXTBOOKS**

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

**REFERENCES**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**  
HYDERABAD

**(CS05434) OOPS THROUGH JAVA**

IVth Year B.Tech. EIE (I Semester) T P C  
4+1 0 4

**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 5<sup>th</sup> Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi/PHI
2. Big Java 2<sup>nd</sup> 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

**(EI05038) ANALYTICAL INSTRUMENTATION****UNIT – I: pH AND CONDUCTIVITY & DISSOLVED COMPONENT ANALYSER**

Conductivity meters – pH meters – Dissolved oxygen, hydrogen analyzers – Sodium analyzer – Silica analyzer and sampling systems.

**UNIT – II: GAS ANALYSERS**

Thermal conductivity types – CO monitor – NOX analyzer – H<sub>2</sub>S analyzer system and sampling – Industrial analyzer circuits. Theory and problems on Beer – Lamberts Law.

**UNIT – III: CHROMATOGRAPHY - I**

Gas chromatography – Liquid chromatography – their principles and applications –

**UNIT – IV: CHROMATOGRAPHY - II**

oxygen analyzer – paramagnetic type – detectors and sampling systems.

**UNIT – V: SPECTROPHOTOMETERS - I**

UV, VIS Spectrophotometers – Single beam and double beam instruments – Instrumentation associated with the above Spectrophotometers – Sources and detectors – Sources and detectors for IR Spectrophotometers.

**UNIT – VI: SPECTROPHOTOMETERS - II**

FT IR Spectrometer – Flame emission and atomic absorption Spectrophotometer – Atomic emission Spectrophotometer - sources for Flame Photometers and online calorific value measurements.

**UNIT – VII: PRINCIPLE OF NUCLEAR MAGNETIC RESONANCE**

Instrumentation associated with NMR Spectrophotometer – Introduction to mass spectrophotometers. Principle and brief discussion on ELECTRON SPIN RESONANCE (ESR.)

**UNIT – VIII: APPLICATIONS**

Nuclear radiation detectors – Ionization chamber – GM Counter – Proportional Counter – Solid state detectors.

**TEXT BOOK:**

1. Handbook of Analytical Instruments – by Khandpur. TMH

**REFERENCES:**

1. Instrumental Methods of Analysis – by Willard H.H., Merrit L.L., Dean J.A.. and Seattle F.L., CBS Publishing and Distributors, 6/e, 1995.
2. Instrument Technology – by Jones B.E., Butterworth Scientific Publ, London, 1987.
3. Mechanical and Industrial Measurements – by Jain R.K., Khanna Publishing, New Delhi, 2/e, 1992.
4. Principles of Instrumental Analysis – by Skoog D.A. and West D.M., Holt Sounder Publication, Philadelphia, 1985.
5. Instrumental Analysis – by Mann C.K., Vickerks T.J. & Gullick W.H., Harper and Row Publishers, New York, 1974.

**(IC05443) PC BASED INSTRUMENTATION**

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

**Unit – II:** Data Acquisition and Control using Standard Cards:

PC expansion systems, Plug-in Data Acquisition Boards; Transducer to Control room, Backplane bus – VXI

**Unit – III:** PC Programming Considerations

Using the command line interface; Assembly language programming: C and C++ programming; Data transfer; Scaling and linearization;

**UNIT – IV:** Programmable logic controller (PLC) basics:

Definition, overview of PLC systems, input/output modules, power supplies and isolators.

**UNIT – V:** Basic PLC programming

Programming on-off inputs/ outputs. Creating Ladder diagrams

**UNIT – VI:** Basic PLC functions

PLC Basic Functions, register basics, timer functions, counter functions.

**UNIT – VI:** PLC intermediate functions:

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

**UNIT – VII:** PLC Advanced functions:

Analog PLC operation, networking of PLC, PLC-PID functions.

**UNIT – VIII:** Related Topics

Alternate programming languages. Auxiliary commands and functions. PLC installation, troubleshooting and maintenance.

Field bus: Introduction, concept. HART protocol: Method of operation, structure, and applications. Smart transmitters, smart valves and smart actuators.

**TEXT BOOKS:**

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

**REFERENCES:**

1. PC Based Instrumentation and Control Third Edition by Mike Tooley ; Elsevier
2. PC Interfacing and Data Acquisition Techniques for Measurement, Instrumentation and Control. By Kevin James; Elsevier
3. Practical Data Acquisition for Instrumentation and Control Systems by John Park and Steve Mackay
4. Distributed Control Systems, Lukcas M.P, Van Nostrand Reinhold Co., New York, 1986.
5. Programmable Logic Controllers, Second edition, Frank D. Petruzella, McGraw Hill, Newyork, 1997.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY****HYDERABAD**

IVth Year B.Tech. EIE (I Semester)

T P C  
4+1 0 4**(IC05463) POWER PLANT INSTRUMENTATION**

(ELECTIVE - I)

**UNIT – I: AN OVERVIEW OF POWER GENERATION**

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

**UNIT – II: PARAMETERS AND MEASUREMENTS - I**

Electrical measurements – current, Voltage, Power, Frequency power factor, Tri-vector meter –

**UNIT – III: PARAMETERS AND MEASUREMENTS - II**

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

**UNIT – IV: COMBUSTION CONTROL IN BOILERS**

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

**UNIT – V: OTHER CONTROLS**

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

**UNIT – VI: TURBINE MONITORING AND CONTROL**

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

**UNIT – VII: ANALYZERS IN POWER PLANTS - I**

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

**UNIT – VIII: ANALYZERS IN POWER PLANTS - II**

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

**REFERENCES:**

1. Modern Power Stations Practice, vol. 6, Instrumentation, Controls and Testing - Pergamon Press, Oxford, 1971.
2. Power Plant Technology – by Wakil M.M., McGraw Hill.
3. Standard Boiler Operations - Questions and Answers – by Elonka S.M., and Kohal A.L., TMH, New Delhi, 1994.

**(CS05159) DATABASE MANAGEMENT SYSTEMS****(ELECTIVE - I)****UNIT – I:**

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

**UNIT – II:**

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

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

**UNIT – III:**

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

**UNIT – IV:**

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

**UNIT – V:**

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

**UNIT – VI:**

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

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

**UNIT – VII:**

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

**UNIT – VIII:**

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

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

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

**TEXT BOOKS:**

1. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGraw-Hill 3<sup>rd</sup> 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 5<sup>th</sup> 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

**(IC05572) VIRTUAL INSTRUMENTATION**  
(ELECTIVE - I)

**UNIT -I**

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

**UNIT -II**

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

**UNIT -III**

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

**UNIT -IV**

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

**UNIT -V**

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

**UNIT -VI**

Networking basics for office & Industrial applications, VISA and IVI.

**UNIT - VII**

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

**UNIT -VIII**

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

**TEXT BOOKS:**

1. Gary Johnson, LabVIEW Graphical Programming, 2<sup>nd</sup> edition, McGraw Hill, Newyork, 1997.
2. Lisa K. wells & Jeffrey Travis, LabVIEW for everyone, Prentice Hall, New Jersey, 1997.

**REFERENCES:**

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

**Course Aim:** This course aims to introduce the latest instrumentation system design and development tools available today

**Prerequisite:** Course on personal computer systems and interfacing

**(EC05170) DIGITAL CONTROL SYSTEMS**  
(ELECTIVE - II)

**UNIT - I SAMPLING AND RECONSTRUCTION**

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

**UNIT-II THE Z - TRANSFORMS**

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

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

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

**UNIT - IV STATE SPACE ANALYSIS**

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

**UNIT - V CONTROLLABILITY AND OBSERVABILITY**

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

**UNIT - VI STABILITY ANALYSIS**

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

**UNIT - VII DESIGN OF DISCRETE TIME CONTROL SYSTEM BY CONVENTIONAL METHODS**

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

**UNIT - VIII STATE FEEDBACK CONTROLLERS AND OBSERVERS**

Design of state feedback controller through pole placement – Necessary and sufficient conditions, Ackerman's formula.

State Observers – Full order and Reduced order observers.

**TEXT BOOKS:**

1. Discrete-Time Control systems - K. Ogata, Pearson Education/PHI, 2<sup>nd</sup> Edition
2. Digital Control and State Variable Methods by M.Gopal, TMH

**REFERENCES:**

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



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B. Tech. EIE (I Semester)

T P C  
4+1 0 4**(CS05049) ARTIFICIAL NEURAL NETWORKS**

(ELECTIVE - II)

**UNIT I****INTRODUCTION TO ARTIFICIAL NEURAL NETWORKS**

Introduction, Artificial Neural Networks, Historical Development of Neural Networks, Biological Neural Networks, Comparison Between Brain and the Computer, Comparison Between Artificial and Biological Neural Networks, Network Architecture, Setting the Weights, Activation Functions, Learning Methods.

**UNIT II****FUNDAMENTAL MODELS OF ARTIFICIAL NEURAL NETWORKS**

Introduction, McCulloch – Pitts Neuron Model, Architecture, Learning Rules, Hebbian Learning Rule, Perceptron Learning Rule, Delta Learning Rule (Widrow-Hoff Rule or Leastmean Square (LMS) rule, Competitive Learning Rule, Out Star Learning Rule, Boltzmann Learning, Memory Based Learning.

**UNIT III****FEED FORWARD NETWORKS**

Introduction, Single Layer Perceptron Architecture, Algorithm, Application Procedure, Perceptron Algorithm for Several Output Classes, Perceptron Convergence Theorem, Brief Introduction to Multilayer Perceptron networks, Back Propagation Network (BPN), Generalized Delta Learning Rule, Back Propagation rule, Architecture, Training Algorithm, Selection of Parameters, Learning in Back Propagation, Application Algorithm, Local Minima and Global Minima, Merits and Demerits of Back Propagation Network, Applications, Radial Basis Function Network (RBFN), Architecture, Training Algorithm for an RBFN with Fixed Centers.

**UNIT IV****ADALINE AND MADALINE NETWORKS**

Introduction, Adaline Architecture, Algorithm, Applications, Madaline, Architecture, MRI Algorithm, MRII Algorithm.

**UNIT V****COUNTER PROPAGATION NETWORKS**

Winner Take – all learning, out star learning, Kohonen Self organizing network, Grossberglayer Network, Full Counter Propagation Network (Full CPN), Architecture, Training Phases of Full CPN, Training Algorithm, Application Procedure, Forward

Only counter Propagation Network, Architecture, Training Algorithm, Applications, Learning Vector Quantizer (LVQ).

**UNIT VI****ASSOCIATIVE MEMORY NETWORKS - I**

Types, Architecture, Continuous and Discrete Hopfield Networks, Energy Analysis, Storage and Retrieval Algorithms, Problems with Hopfield Networks.

**UNIT VII****ASSOCIATIVE MEMORY NETWORKS – II**

Boltzman Machine, Bidirectional Associative Memory, Adaptive Resonance Theory Networks Introduction, Architecture, Algorithm.

**UNIT VIII****APPLICATIONS OF NEURAL NETWORKS**

Implementation of A/D Converter using Hopfield Network, Solving Optimization Problems, Solving Simultaneous Linear Equation, Solving Traveling Salesman Problems using Hopfield Networks, Application in Pattern Recognition, Image Processing,

**TEXTBOOKS**

1. Introduction to Artificial Neural Systems - J.M.Zurada, Jaico Publishers, 3<sup>rd</sup> Edition.
2. Introduction to Neural Networks Using MATLAB 6.0 - S.N. Shivanandam, S. Sumati, S. N. Deepa, TMH.

**REFERENCES**

1. Elements of Artificial Neural Networks - Kishan Mehrotra, Chelkuri K. Mohan, and Sanjay Ranka, Penram International.
2. Artificial Neural Network – Simon Haykin, Pearson Education, 2<sup>nd</sup> Ed.
3. Fundamental of Neural Networks – Laurene Fausett, Pearson, 1<sup>st</sup> Ed.
4. Artificial Neural Networks - B. Yegnanarayana, PHI.

**(CS05138) COMPUTER NETWORKS****(ELECTIVE - II)****UNIT I**

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

**UNIT II**

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

**UNIT III**

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

**UNIT IV**

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

**UNIT V**

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

**UNIT VI**

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

**UNIT VII**

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

**UNIT VIII**

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

**TEXT BOOKS**

1. Computer Networks — Andrew S Tanenbaum, 4<sup>th</sup> Edition. PHI/Pearson Education.

2. Data Communications and Networking – Behrouz A. Forouzan.. third Edition TMH.

**REFERENCES**

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

**(CS05338) JAVA LAB**

1. Write a Java program that prints all real solutions to the quadratic equation  $ax^2 + bx + c = 0$ . Read in a, b, c and use the quadratic formula. If the discriminant  $b^2 - 4ac$  is negative, display a message stating that there are no real solutions.
2. The Fibonacci sequence is defined by the following rule. The first two values in the sequence are 1 and 1. Every subsequent value is the sum of the two values preceding it. Write a Java program that uses both recursive and non recursive functions to print the nth value in the Fibonacci sequence.
3. Write a Java program that prompts the user for an integer and then prints out all prime numbers up to that Integer.
4. Write a Java program that checks whether a given string is a palindrome or not. Ex: MADAM is a palindrome.
5. Write a Java program for sorting a given list of names in ascending order.
6. Write a Java program to multiply two given matrices.
7. Write a Java Program that reads a line of integers, and then displays each integer, and the sum of all the integers (use string to kenizer class)
8. Write a Java program that reads on file name from the user then displays information about whether the file exists, whether the file is readable, whether the file is writable, the type of file and the length of the file in bytes.
9. Write a Java program that reads a file and displays a file and displays the file on the screen, with a line number before each line.
10. Write a Java program that displays the number of characters, lines and words in a text file.
11. Write a Java program that:
  - a) Implements stack ADT.
  - b) Converts infix expression into Postfix form.
12. Write an applet that displays a simple message.
13. Write an applet that computes the payment of a loan based on the amount of the loan, the interest rate and the number of months. It takes one parameter from the browser: Monthly rate; if true, the interest rate is per month; Other wise the interest rate is annual.
14. Write a Java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the + - X % operations. Add a text field to display the result.
15. Write a Java program for handling mouse events.
16. Write a Java program for creating multiple threads
17. Write a Java program that correctly implements producer consumer problem using the concept of inter thread communication.
18. Write a Java program that lets users create Pie charts. Design your own user interface (with swings & AWT)
19. Write a Java program that allows the user to draw lines, rectangles and Ovals.
20. Write a Java program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.
21. Write a Java program that illustrates how run time polymorphism is achieved.

**(EI05331) INSTRUMENTATION LAB – III**

1. Gas analyzer.
2. Gas and liquid chromatography.
3. Spectrometer: UV and VIS spectrometer.
4. Spectrometer: IR and FT IR Spectrometer.
5. Flame photometer.
6. Measurement of calorific value.
7. Mass spectrometer.
8. Nuclear radiation detector.
9. Interfacing of an analog signal to microcomputer through ADC.
10. Interfacing of a Digital signal to Microcomputer through DAC.
11. Interconnection of two microcomputers through serial interface through serial ports.
12. Data Acquisition System.

**(EC05399) MICROCONTROLLERS AND APPLICATIONS**

**UNIT I**  
**OVERVIEW OF ARCHITECTURE AND MICROCONTROLLER RESOURCES**  
 Architecture of a microcontroller – Microcontroller resources – Resources in advanced and next generation microcontrollers – 8051 microcontroller – Internal and External memories – Counters and Timers – Synchronous serial-cum-asynchronous serial communication - Interrupts.

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

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

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

**UNIT V**  
**SYSTEMS DESIGN : DIGITAL AND ANALOG INTERFACING METHODS**  
 Switch, Keypad and Keyboard interfacings – LED and Array of LEDs – Keyboard-cum-Display controller (8279) – Alphanumeric Devices – Display Systems and its interfaces – Printer interfaces – Programmable instruments interface using IEEE 488 Bus – Interfacing with the Flash Memory – Interfaces – Interfacing to High

Power Devices – Analog input interfacing – Analog output interfacing – Optical motor shaft encoders – Industrial control – Industrial process control system – Prototype MCU based Measuring instruments – Robotics and Embedded control – Digital Signal Processing and Digital Filters.

**UNIT VI****REAL TIME OPERATING SYSTEM FOR MICROCONTROLLERS**

Real Time operating system – RTOS of Keil (RTX51) – Use of RTOS in Design – Software development tools for Microcontrollers.

**UNIT VII****16-BIT MICROCONTROLLERS**

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

**UNIT VIII****ARM 32 Bit MCUs**

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

**TEXT BOOKS**

1. Microcontrollers Architecture, Programming, Interfacing and System Design – Raj Kamal, Pearson Education, 2005.
2. The 8051 Microcontroller and Embedded Systems – Mazidi and Mazidi, PHI, 2000.

**REFERENCES**

1. Microcontrollers (Theory & Applications) – A.V. Deshmuk, WTMH, 2005.
2. Design with PIC Microcontrollers – John B. Peatman, Pearson Education, 2005.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4**(ME05508) ROBOTICS AND AUTOMATION**

(ELECTIVE - III)

**UNIT – I BASIC CONCEPTS**

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

**UNIT – II POWER SOURCES AND SENSORS**

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

**UNIT – III MANIPULATORS**

Construction of Manipulators, Manipulator Dynamic and Force Control, Electronic and Pneumatic manipulators.

**UNIT – IV ACTUATORS AND GRIPPERS**

Pneumatic, Hydraulic Actuators, Stepper Motor Control Circuits, End Effector, Various types of Grippers, Design consideration.

**UNIT – V**

Differential transformation and manipulators, Jacobians – problems, Dynamics: Lagrange – Euler and Newton – Euler formations – Problems.

**UNIT VI KINEMATICS**

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

**UNIT VII PATH PLANNING**

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

**UNIT VIII CASE STUDY**

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

**TEXT BOOKS:**

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

**REFERENCES:**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(CS05308) INDUSTRIAL ELECTRONICS**

(ELECTIVE - III)

**UNIT I**

**DC AMPLIFIERS:**

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

**UNIT II**

**REGULATED POWER SUPPLIES:**

Block diagram, Principle of voltage regulation, Series and Shunt type Linear Voltage Regulators, Protection Techniques— Short Circuit, Over voltage and Thermal Protection.

**UNIT III**

**SWITCHED MODE & IC REGULATORS :**

Switched Mode voltage regulator, Comparison of Linear and Switched Mode Voltage Regulators, Servo Voltage Stabilizer, monolithic voltage regulators Fixed and Adjustable IC Voltage regulators, 3-terminal Voltage regulators—Current boosting.

**UNIT IV**

**SCR AND THYRISTOR:**

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

**UNIT V**

**APPLICATIONS OF SCR IN POWER CONTROL:**

Static circuit breaker, Protection of SCR, Inverters—Classification, Single Phase inverters, Converters – single phase Half wave and Full wave.

**UNIT VI**

**DIAC, TRIAC AND THYRISTOR APPLICATIONS:**

Chopper circuits – Principle, methods and Configurations, Diac and Triac, Triacs – Triggering modes, Firing Circuits, Commutation.

**UNIT VII**

**INDUSTRIAL APPLICATIONS - I**

Industrial timers -Classification, types, Electronic Timers – Classification, RC and Digital timers, Time base Generators. Electric Welding – Classification, types and methods of Resistance and ARC welding, Electronic DC Motor Control.

**UNIT VIII**

**INDUSTRIAL APPLICATIONS - II**

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

**TEXTBOOKS:**

1. Industrial and Power Electronics – G.K. Mithal and Maneesha Gupta, Khanna Publishers, 19<sup>th</sup> Ed., 2003.
2. Integrated Electronics – J. Millman and C.C Halkias, McGraw Hill, 1972.

**REFERENCES :**

1. Electronic Devices and circuits – Theodore.H.Bogart, Pearson Education, 6<sup>th</sup> Edn., 2003.
2. Thyristors and applications – M. Rammurthy, East-West Press, 1977.
3. Integrated Circuits and Semiconductor Devices – Deboo and Burroughs, ISE.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(EC05215) EMBEDDED AND REAL TIME SYSTEMS**

(ELECTIVE - III)

**UNIT I**

**INTRODUCTION**

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

**UNIT II**

**GENERAL PURPOSE PROCESSORS**

Basic architecture, operation, Pipelining, Programmer's view, development environment, Application Specific Instruction-Set Processors (ASIPs) – Micro Controllers and Digital Signal Processors.

**UNIT III**

**STATE MACHINE AND CONCURRENT PROCESS MODELS**

Introduction, models Vs. languages, finite state machines with data path model (FSMD), using state machines, program state machine model (PSM), concurrent process model, concurrent processes, communication among processes, synchronization among processes, implementation, data flow model, real-time systems.

**UNIT IV**

**COMMUNICATION INTERFACE**

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

**UNIT V**

**EMBEDDED / RTOS CONCEPTS – I**

Architecture of the Kernel, Tasks and Task scheduler, Interrupt service routines, Semaphores, Mutex.

**UNIT VI**

**EMBEDDED / RTOS CONCEPTS – II**

Mailboxes, Message Queues, Event Registers, Pipes, Signals

**UNIT VII**

**EMBEDDED / RTOS CONCEPTS – III**

Timers, Memory Management, Priority inversion problem, Embedded operating systems Embedded Linux, Real-time operating systems, RT Linux, Handheld operating systems, Windows CE.

**UNIT VIII**

**DESIGN TECHNOLOGY**

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

**TEXT BOOKS**

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

**REFERENCES**

1. Embedded Microcomputer Systems – Jonathan W. Valvano, Brooks / Cole, Thompson Learning.
2. An Embedded Software Primer – David E. Simon, Pearson Ed., 2005.
3. Introduction to Embedded Systems – Raj Kamal, TMS, 2002.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(EI05351) MANAGEMENT INFORMATION SYSTEMS**

(ELECTIVE - IV)

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

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

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

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

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

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

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

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

**TEXT BOOK**

1. Management Information Systems Kenneth - C. Laudon, Jane P. Laudon & VM Prasad, 9/e, Pearson Education, 2005.

**REFERENCES**

1. Management Information Systems - Efty Oz, Third Edition, Thomson, 2002.
2. Information Technology-Strategic Decision Making for Managers - M Henry C.Lucas, Jr., John Wiley & Sons, Inc, 2005.
3. Introduction to Information Systems, - James A. O'Brien, TMH, New Delhi, 2002.
4. Information Systems Today - Jessup & Velach, PHI, 2004.
5. Management Information Systems - Sadagopan, PHI, 2004.
6. Information Systems, Pearson Education - Steven Alter, Fourth Edition, 2004.
7. Information Technology, - Turban, Rainer, Potter, John Wiley, 2003.
8. Management Information Systems - W S Jawadekar, TMH, Second Edition, 2002.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4

**(EN05544) TELEMETRY & TELECONTROL**

(ELECTIVE - IV)

**UNIT – I: TELEMETRY PRINCIPLES**

Introduction, Functional blocks of Telemetry system, Methods of Telemetry - Non Electrical, Electrical, Pneumatic, Frequency, Power Line Carrier Communication .

**UNIT – II: SYMBOLS AND CODES**

Bits and Symbols, Time function pulses, Line and Channel Coding, Modulation Codes, Intersymbol Interference.

**UNIT – III: FREQUENCY DIVISION MULTIPLEXED SYSTEMS**

FDM, IRIG Standard, FM and PM Circuits, Receiving end, PLL

**UNIT – IV: TIME DIVISION MULTIPLEXED SYSTEMS**

TDM-PAM, PAM /PM and TDM – PCM Systems. PCM reception. Differential PCM. Introduction, QAM, Protocols.

**UNIT – V: SATELLITE TELEMETRY**

General considerations, TT&C Service, Digital Transmission systems, TT&C Sub-systems, Telemetry and Communications.

**UNIT – VI: OPTICAL TELEMETRY**

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

**UNIT – VII & VIII: TELECONTROL METHODS**

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

**TEXT BOOKS:**

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

**REFERENCES:**

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

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY**

HYDERABAD

IVth Year B.Tech. EIE (II Semester)

T P C  
4+1 0 4**(EC05183) DSP PROCESSORS AND ARCHITECTURES**

(ELECTIVE - IV)

**UNIT I****INTRODUCTION TO DIGITAL SIGNAL PROCESSING**

Introduction, A Digital signal-processing system, The sampling process, Discrete time sequences, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Linear time-invariant systems, Digital filters, Decimation and Interpolation, Analysis and Design tool for DSP Systems MATLAB, DSP using MATLAB.

**UNIT II****COMPUTATIONAL ACCURACY IN DSP IMPLEMENTATIONS**

Number formats for signals and coefficients in DSP systems, Dynamic Range and Precision, Sources of error in DSP implementations, A/D Conversion errors, DSP Computational errors, D/A Conversion Errors, Compensating filter.

**UNIT III****ARCHITECTURES FOR PROGRAMMABLE DSP DEVICES**

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

**UNIT IV****EXECUTION CONTROL AND PIPELINING**

Hardware looping, Interrupts, Stacks, Relative Branch support, Pipelining and Performance, Pipeline Depth, Interlocking, Branching effects, Interrupt effects, Pipeline Programming models.

**UNIT V****PROGRAMMABLE DIGITAL SIGNAL PROCESSORS**

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

**UNIT VI****IMPLEMENTATIONS OF BASIC DSP ALGORITHMS**

The Q-notation, FIR Filters, IIR Filters, Interpolation Filters, Decimation Filters, PID Controller, Adaptive Filters, 2-D Signal Processing.

**UNIT VII****IMPLEMENTATION OF FFT ALGORITHMS**

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

**UNIT VIII****INTERFACING MEMORY AND I/O PERIPHERALS TO PROGRAMMABLE DSP DEVICES**

Memory space organization, External bus interfacing signals, Memory interface, Parallel I/O interface, Programmed I/O, Interrupts and I/O, Direct memory access (DMA).

A Multichannel buffered serial port (McBSP), McBSP Programming, a CODEC interface circuit, CODEC programming, A CODEC-DSP interface example.

**TEXT BOOKS**

1. Digital Signal Processing – Avtar Singh and S. Srinivasan, Thomson Publications, 2004.

2. DSP Processor Fundamentals, Architectures & Features – Lapsley et al. S. Chand & Co, 2000.

**REFERENCES**

1. Digital Signal Processors, Architecture, Programming and Applications – B. Venkata Ramani and M. Bhaskar, TMH, 2004.
2. Digital Signal Processing – Jonatham Stein, John Wiley, 2005.