B.TECH. WEEKEND SEMESTER- I
MATH(W)-101 : MATHEMATICS-III
(COMMON TO ECE, EE, CSE, ME)

L	P	Credits
3	0	5

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Part-A

Fourier Series and Fourier Transforms : Euler's formulae, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and consine series.

Fourier integrals, Fourier transforms, Shifting theorem (both on time and frequency axes), Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Part-B

Functions of Complex Variable: Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and Analyticity.

Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems. Integration of complex functions. Cauchy-Integral theorem and formula.

Power series, radius and circle of convergence, Taylor's Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues. Evaluation of real integrals using residues (around unit and semi circle only).

Part-C

Probability Distributions and Hypothesis Testing : Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions.

Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (applications only), Chi-square test of goodness of fit.

Linear Programming : Linear programming problems formulation, Solving linear programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

TEXT BOOKS :

1. Advanced Engg. Mathematics : F Kreyszig.
2. Higher Engg. Mathematics : B.S. Grewal.

REFERENCE BOOKS :

1. Advance Engg. Mathematics : R.K. Jain, S.R.K.Iyenger.
2. Advanced Engg. Mathematics : Michael D. Greenberg.
3. Operation Research : H.A. Taha.
4. Probability and statistics for Engineers : Johnson. PHI.

Note: Examiner will set eight questions, taking two from Part-A, three from Part-B and three from Part-C. Students will be required to attempt five question taking atleast one from each part.

B.TECH. WEEKEND SEMESTER- I
HUM(W)-101 : ECONOMICS
(COMMON TO ECE, EE, CSE, ME)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

COURSE OBJECTIVE: The purpose of this course is to:

1. Acquaint the student in the basic economic concepts and their operational significance and
2. Stimulate him to think systematically and objectively about contemporary economic problems.

UNIT-I

Definition of Economics - various definitions, Nature of Economic problem, Production possibility curve Economic laws and their nature. Relation between Science, Engineering, Technology and Economics.

UNIT-II

Concepts and measurement of utility, Law of Diminishing Marginal Utility, Law of equi-marginal utility - its practical application and importance.

UNIT-III

Meaning of Demand, Individual and Market demand schedule, Law of demand, shape of demand curve, Elasticity of demand, measurement of elasticity of demand, factors effecting elasticity of demand, practical importance & applications of the concept of elasticity of demand.

UNIT-IV

Meaning of production and factors of production; Law of variable proportions, Returns to scale, Internal and External economics and diseconomies of scale.

Various concepts of cost - Fixed cost, variable cost, average cost, marginal cost, money cost, real cost opportunity cost. Shape of average cost, marginal cost, total cost etc. in short run and long run.

UNIT-V

Meaning of Market, Types of Market - Perfect Competition, Monopoly, Oligoply, Monoplistic Competition (Main features of these markets)

Supply and Law of Supply, Role of Demand & Supply in Price Determinition and effect of changes in demand and supply on prices.

UNIT-VI

Nature and characteristics of Indian economy (brief and elementary introduction), Privatization - meaning, merits and demerits. Globalisation of Indian economy - merits and demerits. Elementary Concepts of VAT, WTO, GATT & TRIPS agreement.

Books Recommended :

TEXT BOOKS :

1. Principles of Economics : P.N. Chopra (Kalyani Publishers).
2. Modern Economic Theory – K.K. Dewett (S.Chand)

REFERENCE BOOKS :

1. A Text Book of Economic Theory Stonier and Hague (Longman's Landon)
2. Micro Economic Theory – M.L. Jhingan (S.Chand)
3. Micro Economic Theory - H.L. Ahuja (S.Chand)
4. Modern Micro Economics : S.K. Mishra (Pragati Publications)
5. Economic Theory - A.B.N. Kulkarni & A.B. Kalkundrikar (R.Chand & Co.)
6. Indian Economy : Rudar Dutt & K.P.M. Sundhram

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- I
HUM(W)-103 : FUNDAMENTALS OF MANAGEMENT
(COMMON TO ECE, EE, ME)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT-I

Meaning of management, Definitions of Management, Characteristics of management, Management Vs. Administration. Management-Art, Science and Profession. Importance of Management, Development of Management thoughts.

Principles of Management. The Management Functions, Inter-relationship of Managerial functions.

UNIT-II

Nature and Significance of staffing, Personnel management, Functions of personnel management, Manpower planning, Process of manpower planning, Recruitment, Selection; Promotion - Seniority Vs. Merit. Training - objectives and types of training.

UNIT-III

Production Management : Definition, Objectives, Functions and Scope, Production Planning and Control; its significance, stages in production planning and control. Brief introduction to the concepts of material management, inventory control; its importance and various methods.

UNIT-IV

Marketing Management - Definition of marketing, Marketing concept, objectives & Functions of marketing. Marketing Research - Meaning; Definition; objectives; Importance; Limitations; Process. Advertising - meaning of advertising, objectives, functions, criticism.

UNIT-V

Introduction of Financial Management, Objectives of Financial Management, Functions and Importance of Financial Management. Brief Introduction to the concept of capital structure and various sources of finance.

BOOKS RECOMMENDED :

TEXT BOOKS :

1. Principles and Practice of Management - R.S. Gupta, B.D.Sharma, N.S. Bhalla. (Kalyani Publishers)
2. Organisation and Management - R.D. Aggarwal (Tata Mc Graw Hill)

REFERENCE BOOKS :

1. Principles & Practices of Management – L.M. Prasad (Sultan Chand & Sons)
2. Management – Harold, Koontz and Cyrilo Donell (Mc.Graw Hill).
3. Marketing Management – S.A. Sherlikar (Himalaya Publishing House, Bombay).
4. Financial Management - I.M. Pandey (Vikas Publishing House, New Delhi)
5. Management - James A.F. Stoner & R.Edward Freeman, PHI.

NOTE: Eight questions are to be set atleast one question from each unit and the students will have to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- I
ECE(W)-101 : ELECTRICAL ENGINEERING MATERIALS AND SEMICONDUCTOR DEVICES

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 CONDUCTING MATERIALS:
Review of energy bands, description of materials, drift velocity, collision time, Mean free path, mobility, conductivity, relaxation time, factors affecting conductivity of materials, types of thermal conductivity, Wiedmann-Franz law, super conductivity, effect of magnetic field, conducting materials, applications.

UNIT 2 DIELECTRIC MATERIALS:
Behaviour of dielectric materials in static electric field, Dipole moments, Polarization, Dielectric constant, Polarizability, Susceptibility, mechanisms of polarization, behaviour in alternating field, dielectric loss, loss tangent, types of dielectric & insulating materials, electrostriction, Piezo-electricity, Applications.

UNIT 3 MAGNETIC MATERIALS:
Permeability, Magnetic susceptibility, magnetic moment, Magnetization, Dipole moment, types of magnetic materials, Magnetostriction, eddy current & hysteresis losses, applications.

UNIT 4 SEMICONDUCTORS:
Review of Si and Ge as semiconducting materials, Continuity Equation, P-N junction, Drift & Diffusion, Diffusion & Transition capacitances of P-N junction.

UNIT 5 CONSTRUCTION AND CHARACTERISTICS OF DEVICES:
Brief introduction to Planar Technology for device fabrication., metal -semiconductor junctions (ohmic and non-ohmic), breakdown mechanisms in p-n junction, zener diode, electrical and optical excitation in diodes, LED, solar cells and photo-detectors.

UNIT 6 BIPOLAR AND MOS DEVICES : BJT, UJT, JFET, MOSFETS

UNIT 7 POWER DEVICES : Thyristor, Diac, Triac, GTO, IGBT, VMOS

TEXT BOOKS:

1. Electrical Engineering Materials: A.J. Dekker; PHI.
2. Solid State Electronic Devices : StreetMan & Banerjee; Pearson.
3. Electronic Devices & Circuits: Millman & Halkias; MGH.

REFERENCE BOOKS:

1. Electrical Engineering Materials: S.P Seth & P.V Gupta; Dhanpat Rai.
2. Text Book of Power Electronics : H.C.Rai; Galgoitia Publications.
3 Electronic Devices & Circuit Theory : Boylestad & Nashelsky; Pearson.
4. Semiconductor devices : Jaspreet Singh; John Wiley.

NOTE : Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- I
EE(W)-103 : ELECTROMAGNETIC THEORY
(COMMON TO EE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1.STATIC ELECTRIC FIE0LDS:
Coulomb's Law, Gauss's Law, potential function, field due to a continuous distribution of charge, equi-potential surfaces, Gauss's Theorem, Poison's equation, Laplace's equation, method of electrical images, capacitance, electro-static energy, boundary conditions, the electro-static uniqueness theorem for field of a charge distribution, Dirac-Delta representation for a point charge and an infinitesimal dipole.

UNIT2. STEADY MAGNETIC FIELDS :
Faraday Induction law, Ampere's Work law in the differential vector form, Ampere's law for a current element, magnetic field due to volume distribution of current and the Dirac-delta function, Ampere's Force Law, magnetic vector potential, vector potential (Alternative derivation), far field of a current distribution, equation of continuity.

UNIT3. TIME VARYING FIELDS :
Equation of continuity for time varying fields, inconsistency of Ampere's law, Maxwell's field equations and their interpretation, solution for free space conditions, electromagnetic waves in a homogeneous medium, propagation of uniform plane-wave, relation between E & H in a uniform plane-wave, wave equations for conducting medium, Maxwell's equations using phasor notation, wave propagation in a conducting medium, conductors, dielectrics, wave propagation in good conductor and good dielectric, depth of penetration, polarization, linear, circular and elliptical,

UNIT4. REFLECTION AND REFRACTION OF E M WAVES:
Reflection and refraction of plane waves at the surface of a perfect conductor & perfect dielectric (both normal incidence as well as oblique incidence), Brewester's angle and total internal reflection, reflection at the surfaces of a conductive medium, surface impedance, transmission-line analogy, poynting theorem, interpretation of E x H, power loss in a plane conductor.

UNIT5.TRASMISSION LINE THEORY :
Transmission line as a distributed circuit, transmission line equation, travelling ,standing waves , characteristic impedance, input impedance of terminated line, reflection coefficient, VSWR, Smith's chart and its applications.

TEXT BOOK :
1. Electro-magnetic Waves and Radiating System : Jordan & Balmain, PHI.

Refrence Books:
1. Engineering Electromagnetics : Hayt; TMH
2. Electro-Magnetics : Krauss J.DF; Mc Graw Hill.

NOTE: 8 questions are to be set –atleast one from each unit. Students have to attempt any five questions.

B.TECH. WEEKEND SEMESTER- I

ECE(W)-121 : ELECTRICAL ENGINEERING MATERIALS AND SEMICONDUCTOR DEVICES LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. To study V-I characteristics of diode, and its use as a capacitance.

2. Study of the characteristics of transistor in Common Base configuration.

3. Study of the characteristics of transistor in Common Emitter configuration.

4. Study of V-I characteristics of a photo-voltaic cell.

5. Study of characteristics of MOSFET/JFET is CS configuration.

6. To plot characteristics of thyristor.

7. To plot characteristics of UJT .

8. To plot characteristics of diac & Triac.

9. Study of loss factor in a dielectric by an impedance bridge.

10. Study of photo-resist in metal pattern for planar technology/PCB technology.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- II
ECE(W)-102 : ANALOG ELECTRONICS
(COMMON TO ECE, EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 SEMICONDUCTOR DIODE :
P-N junction and its V-I Characteristics, P-N junction as a rectifier, Switching characteristics of Diode.

UNIT 2 DIODE CIRCUITS :
Diode as a circuit element, the load-line concept, half-wave and full wave rectifiers, clipping circuits, clamping circuits, filter circuits, peak to peak detector and voltage multiplier circuits.

UNIT 3 TRANSISTOR AT LOW FREQUENCIES:
Bipolar junction transistor : operation, characteristics, Ebers-moll model of transistor, hybrid model, h-parameters (CE, CB, CC configurations), analysis of a transistor amplifier circuits using h-parameters, emitter follower, Miller's Theorem , frequency response of R-C coupled amplifier.

UNIT 4 TRANSISTOR BIASING :
Operating point, bias stability, collector to base bias, self-bias, emitter bias, bias compensation, thermistor & sensistor compensation.

UNIT 5 TRANSISTOR AT HIGH FREQUENCIES:
Hybrid P model, CE short circuit current gain, frequency response, alpha, cutoff frequency, gain bandwidth product, emitter follower at high frequencies.

UNIT 6 FIELD EFFECT TRANSISTORS :
Junction field effect transistor, pinch off voltage, volt-ampere characteristics, small signal model, MOSFET Enhancement & Depletion mode, V-MOSFET.Common source amplifier, source follower, biasing of FET, applications of FET as a voltage variable resistor (V V R).

UNIT 7 REGULATED POWER SUPPLIES :
Series and shunt voltage regulators, power supply parameters, three terminal IC regulators, SMPS.

TEXT BOOK :
1 .Integrated Electronics: Millman & Halkias ; McGrawHill
2. Electronic circuit analysis and design (Second edition): D.A.Neamen; TMH

REFERENCE BOOKS:
1. Electronics Principles: Malvino ; McGrawHill
2. Electronics Circuits: Donald L. Schilling & Charles Belove ; McGrawHill
3. Electronics Devices & Circuits: Boylestad & Nashelsky ; Pearson.

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- II
CSE(W)-108 : DATA STRUCTURES & ALGORITHMS
(COMMON TO CSE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Unit-1: Introduction to Data Structures: Definition of data structures and abstract data types, Static and Dynamic implementations, Examples and real life applications; The Stacks : Definition, Array based implementation of stacks, Linked List based implementation of stacks, Examples : Infix, postfix, prefix representation, Conversions, Applications.

Unit-2: Queues and Lists: Definition, Array based implementation of Queues / Lists, Linked List implementation of Queues / Lists, Circular implementation of Queues and Singly linked Lists, Straight / circular implementation of doubly linked Queues / Lists, Priority Queues, Applications.

Unit-3: Trees: Definition of trees and Binary trees, Properties of Binary trees and Implementation, Binary Traversal pre-order, post order, In- order traversal, Binary Search Trees, Implementations, Threaded trees, Balanced multi way search trees, AVL Trees, Implementations

Unit-4: Graphs: Definition of Undirected and Directed Graphs and Networks, The Array based implementation of graphs, Adjacency matrix, path matrix implementation, The Linked List representation of graphs, Shortest path Algorithm, Graph Traversal – Breadth first Traversal, Depth first Traversal, Tables : Definition, Hash function, Implementations and Applications.

Unit-5: Running time: Time Complexity, Big – Oh - notation, Running Times, Best Case, Worst Case, Average Case, Factors depends on running time, Introduction to Recursion, Divide and Conquer Algorithm, Evaluating time Complexity.

Unit-6: Sorting Algorithms : Introduction, Sorting by exchange, selection, insertions : Bubble sort, Straight selection sort, Efficiency of above algorithms,; Shell sort, Performance of shell sort, Merge sort, Merging of sorted arrays& Algorithms; Quick sort Algorithm analysis,

Heap sort: Heap Construction, Heap sort, bottom – up, Top – down Heap sort approach;

Searching Algorithms: Straight Sequential Search, Binary Search (recursive & non–recursive Algorithms)

Text Book:

Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's Outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – William J. Collins, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- II
EE(W)-102 : NETWORK THEORY
(COMMON TO EE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT I TRANSIENT RESPONSE :
Transient Response of RC, RL, RLC Circuits to various excitation signals such as step, ramp, impulse and sinusoidal excitations using laplace transform.

UNIT 2 NETWORK FUNCTIONS :
Terminal pairs or Ports, Network functions for one-port and two-port networks, poles and zeros of Network functions, Restrictions on pole and zero Locations for driving point functions and transfer functions, Time domain behavior from the pole-zero plot.

UNIT 3 CHARACTERISTICS AND PARAMETERS OF TWO PORT NETWORKS :
Relationship of two-port variables, short-circuit Admittance parameters, open circuit impedance, parameters, Transmission parameters, hybrid parameters, relationships between parameter sets, Inter-connection of two port networks.

UNIT 4 TOPOLOGY :
Principles of network topology , graph matrices, network analysis using graph theory.

UNIT 5 TYPES OF FILTERS AND THEIR CHARACTERISTICS :
Filter fundamentals, high-pass, low-pass, band-pass, and band-reject Filters.

UNIT 6 NETWORK SYNTHESIS :
Positive real functions, synthesis of one port and two port networks, elementary ideas of Active networks.

TEXT BOOKS:

1. Network Analysis & Synthesis : Umesh Sinha; Satya Prakash Pub.
2. Network Analysis & Synthesis : F.F.Kuo; John Wiley & Sons Inc.

REFERENCE BOOKS:

1. Introduction to modern Network Synthesis : Van Valkenburg; John Wiley
2. Network Analysis: Van Valkenburg; PHI
3. Basic circuit theory:Dasoer Kuh; McGraw Hill.
4. A Course in Electrical Circuit Analysis by Soni & Gupta; Dhanpat Rai Publication.
5. Circuit Analysis : G.K. Mithal; Khanna Publication.
6. Networks and Systems : D.Roy Choudhury; New Age International.

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- II
MATH(W)-102: NUMERICAL METHODS
(COMMON TO EE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Part-A

Interpolation and curve fitting : Interpolation problem, Lagrangian polynomials, Divided differences, Interpolating with a cubic spline, Bezier curves and B-spline curves, Least square approximations.

Non-Linear Equations : Bisection method, Linear Interpolation methods, Newton's method, Muller's method, fixed-point method.

Simultaneous Linear Equations : Elimination method, Gauss and Gauss-Jordan method, Jacobi's method, Gauss-Seidal method, Relaxation method.

Numerical Differentiation and Integration : Derivatives from differences tables, Higher order derivatives, Extrapolation techniques, Newton-cotes integration formula, Trapezoidal rule, Simpson's rules, Boole's rule and Weddle's rule, Romberg's Integration.

Part-B

Numerical Solution of Ordinary Differential Equations : Taylor series method, Euler and modified Euler method, Runge-Kutta methods, Milne's method, Adams-Moulton method, Power method for Eigen values by iteration.

Numerial Solution of Partial Differential Equations : Finite difference approximations of partial derivatives, solution of Laplace equation (Standard 5-point formula only), one-dimensional heat equation (Schmidt method, Crank-Nicolson method, Dufort and Frankel method) and wave equation.

TEXT BOOKS :

1. Applied Numerical Analysis : Curtis F. Gerald and Patrick G. Wheatley-Pearson, Education Ltd.
2. Numerical Method : E. Balagurusamy T.M.H.

REFERENCE BOOKS :

1. Numerical Methods for Scientific and Engg. Computations : M.K. Jain, S.R.K. Iyenger and R.K. Jain- Wiley Eastern Ltd.
2. Introductory Methods of Numerical Analysis S.S. Sastry, P.H.I.
3. Numerical Methods in Engg. & Science : B.S. Grewal.

Note: Examiner will set eight questions, taking four from Part-A and four from Part-B. Students will be required to attempt five questions taking atleast two from each part.

B.TECH. WEEKEND SEMESTER- II
ECE(W)-122 : ANALOG ELECTRONICS LAB
(COMMON TO ECE, EE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Study of Half wave & full wave rectifiers.
2. Study of power supply filters.
3. Study of Diode as clipper & clamper.
4. Study of Zener diode as a voltage regulator.
5. Study of CE amplifier for voltage, current & Power gains and input, output impedances..
6. Study of CC amplifier as a buffer.
7. To study the frequency response of RC coupled amplifier.
8. Study of 3-terminal IC regulator.
9. Study of transistor as a constant current source in CE configuration.
10. Study of FET common source amplifier.
11. Study of FET common Drain amplifier.
12. Graphical determination of small signal hybrid parameters of bipolar junction transistor.
13. Study & design of a d.c. voltage doubler.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- II
EE(W)-122 : NETWORK THEORY LAB
(COMMON TO EE, ECE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Transient response of RC circuit.
2. Transient response of RL circuit.
3. To find the resonance frequency, Band width of RLC series circuit.
4. To calculate and verify "Z" parameters of a two port network.
5. To calculate and verify "Y" parameters of a two port network.
6. To determine equivalent parameter of parallel connections of two port network.
7. To plot the frequency response of low pass filter and determine half-power frequency.
8. To plot the frequency response of high pass filter and determine the half-power frequency.
9. To plot the frequency response of band-pass filter and determine the band-width.
10. To calculate and verify "ABCD" parameters of a two port network.
11. To synthesize a network of a given network function and verify its response.
12. Introduction of P-Spice

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- II
MATH(W)-122 : NUMERICAL METHODS LAB
(COMMON TO EE, ECE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

WRITE DOWN AND EXECUTE THE FOLLOWING PROGRAMS USING C++/MATLAB

1. To find the roots of non-linear equation using Bisection method.
2. To find the roots of non-linear equation using Newton's method.
3. Curve fitting by least - square approximations.
4. To solve the system of linear equations using Gauss- Elimination method.
5. To solve the system of linear equations using Gauss-Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jorden method.
7. To Integrate numerically using Trapezoidal rule.
8. To Integrate numerically using Simpson's rules.
9. To find the largest eigen value of a matrix by power-method.
10. To find numerical solution of ordinary differential equations by Euler's method.
11. To find numerical solution of ordinary differential equations by Runge-Kutta method.
12. To find numerical solution of ordinary differential equations by Milne's method.
13. To find the numerical solution of Laplace equation.
14. To find numerical solution of wave equation.
15. To find numerical solution of heat equation.

BOOKS SUGGESTED :

1. Applied Numerical Analysis by Curtis F. Gerald and Patrick G. Wheatley-Pearson, Education Ltd.
2. Numerical Methods : E. Balagurusamy T.M.H.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- III
ECE(W)-201 : DIGITAL ELECTRONICS
(COMMON TO ECE, EE, CSE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 FUNDAMENTALS OF DIGITAL TECHNIQUES :
Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray, EBCDIC, ASCII, Error detection and correction codes.

UNIT 2 COMBINATIONAL DESIGN USING GATES:
Design using gates, Karnaugh map and Quine Mcluskey methods of simplification.

UNIT 3 COMBINATIONAL DESIGN USING MSI DEVICES
Multiplexers and Demultiplexers and their use as logic elements, Decoders, Adders / Subtractors, BCD arithmetic circuits, Encoders, Decoders / Drivers for display devices.

UNIT 4 SEQUENTIAL CIRCUITS:
Flip Flops : S-R, J-K, T, D, master-slave, edge triggered, shift registers, sequence generators, Counters, Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

UNIT 5 DIGITAL LOGIC FAMILIES:
Switching mode operation of p-n junction, bipolar and MOS. devices. Bipolar logic families:RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic, Interfacing of CMOS and TTL families.

UNIT 6 A/D AND D/A CONVERTERS:
Sample and hold circuit, weighted resistor and R -2 R ladder D/A Converters, specifications for
D/A converters. A/D converters : Quantization, parallel -comparator, successive approximation, counting type, dual-slope ADC, specifications of ADCs.

UNIT 7 PROGRAMMABLE LOGIC DEVICES:
ROM, PLA, PAL, FPGA and CPLDs.

TEXT BOOK :
1. Modern Digital Electronics(Edition III) : R. P. Jain; TMH

REFERENCE BOOKS :
1. Digital Integrated Electronics : Taub & Schilling; MGH
2. Digital Principles and Applications : Malvino & Leach; McGraw Hill.
3. Digital Design : Morris Mano; PHI.

NOTE : Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- III
EE(W)-205 : ELECTROMECHANICAL ENERGY CONVERSION

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 MAGNETIC CIRCUITS AND INDUCTION:
Magnetic Circuits, Magnetic Materials and their properties, static and dynamic emfs and force on current carrying conductor, AC operation of Magnetic Circuits, Hysteresis and Eddy current losses.

UNIT 2 PRINCIPLES OF ELECTROMECHANICAL ENERGY CONVERSION:
Force and torque in magnetic field system, energy balance, energy and force in singly excited magnetic field system, concept of co-energy, forces and torques in system with permanent magnets, dynamic equation.

UNIT 3 TRANSFORMERS :
Basic theory, construction , operation at no-load and full-load, equivalent circuit, phasor diagram, O.C. and S.C. tests for parameters determination, efficiency and regulation, auto-transformer, introduction to three-phase transformer ; Current and Potential Transformers : Principle, construction, analysis and applications.

UNIT 4 DC MACHINES :
Basic theory of DC generator, brief idea of construction, emf equation, load characteristics, basic theory of DC motor, concept of back emf, torque and power equations, load characteristics, starting and speed control of DC motors, applications.

UNIT 5 INDUCTION MOTOR:
Basic theory, construction, Phasor diagram, Equivalent circuit, Torque equation, Load characteristics, starting and speed control of induction motor, Introduction to single phase Induction motor and its applications, Fractional H.P. Motors, Introduction to stepper, servo reluctance and universal motors.

UNIT 6 SYNCHRONOUS MACHINES:
Construction and basic theory of synchronous generator, emf equation, model of generator, Phasor diagram, Regulation, Basic theory of synchronous motor, v-curves, synchronous condenser, applications.

TEXT BOOK:

1. Electrical Machines: Nagarath and Kothari; TMH

REFERENCE BOOKS:

1. Electrical Machines :P.S. Bimbhra; Khanna
2. Electrical Machines: Mukherjee and Chakravorti; Dhanpat Rai & Sons
3. Electrical Technology (Vol-II) : B.L Theraja; S. Chand.

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- III
ECE(W)-203 : COMMUNICATION SYSTEMS
(COMMON TO ECE, EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. INTRODUCTION TO COMMUNICATION SYSTEMS :
The essentials of a Communication system, modes and media's of Communication, Classification of signals and systems , Fourier Analysis of signals.

UNIT 2. AMPLITUDE MODULATION :
Amplitude modulation, Generation of AM waves, Demodulation of AM waves, DSBSC, Generation of DSBSC waves, Coherent detection of DSBSC waves, single side band modulation, generation of SSB waves, demodulation of SSB waves, vestigial sideband modulation (VSB).

UNIT 3. ANGLE MODULATION :
Basic definitions: Phase modulation (PM) & frequency modulation(FM), narrow band frequency modulation, wideband frequency modulation, generation of FM waves, Demodulation of FM waves.

UNIT 4. PULSE ANALOG MODULATION :
Sampling theory, time division (TDM) and frequency division (FDM) multiplexing, pulse amplitude modulation (PAM), pulse time modulation.

UNIT 5. PULSE DIGITAL MODULATION :
Elements of pulse code modulation, noise in PCM systems, Measure of information, channel capacity, channel capacity of a PCM system, differential pulse code modulation (DPCM). Delta modulation (DM)

UNIT 6. DIGITAL MODULATION TECHNIQUES:
ASK, FSK, BPSK, QPSK, M-ary PSK.

UNIT 7. INTRODUCTION TO NOISE:
External noise, Internal noise, S/N ratio, noise figure.

TEXT BOOKS :
1. Communication systems (4th edn.) : Simon Haykins; John wiley & sons.
2. Communication systems: Singh & Sapre; TMH.
3. Analog Communication: Manoj Duhan; I.K International.

REFERENCE BOOKS :
1. Electronic Communication systems : Kennedy; TMH.
2. Communication Electronics : Frenzel; TMH.
3. Communication system : Taub & Schilling; TMH.
4. Communication systems : Bruce Carlson.

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- III
CSE(W)-203 : COMPUTER ARCHITECTURE AND ORGANISATION

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Unit-1: Basic Principles: Boolean algebra and Logic gates, Combinational logic blocks(Adders, Multiplexers, Encoders, de-coder), Sequential logic blocks(Latches, Flip-Flops, Registers, Counters)

Unit-2: General System Architecture: Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

Unit-3: Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MSAM.

Unit-4: Basic non pipelined CPU Architecture: CPU Architecture types (accumulator, register, stack, memory/ register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining.

Unit-5: Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations.

Unit-6: Introduction to Parallelism: Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).

Unit-7: Computer Organization [80x86]: Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy.

Text Books:

- Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
- Computer Architecture and Organization, 3rd Edi, by John P. Hayes, 1998, TMH.

Reference Books:

- Operating Systems Internals and Design Principles by William Stallings,4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
- Computer Organization, 5th Edi, by Carl Hamacher, Zvonko Vranesic,2002, Safwat Zaky.
- Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
- Computer Organisation & Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International edition.
- Computer System Architecture by M. Mano, 2001, Prentice-Hall.
- Computer Architecture- Nicholas Carter, 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- III
EE(W)-225 : ELECTROMECHANICAL ENERGY CONVERSION LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. To find turns ratio and polarity of a single phase transformer.
2. To perform open and short circuit tests on a single phase transformer.
3. To perform Sumpner's back to back test on single phase transformers.
4. Parallel operation of two single phase transformers.
5. Study of construction of a DC machine.
6. To plot O.C.C of a DC shunt generator and find its Critical Resistance.

6. To perform direct load test of a DC motor.

8. Speed control of a DC motor by armature control and field control methods.
9. To perform open circuit and block rotor tests of an induction motor.
10. Star-delta starting of a three phase induction motor.
11. Plot O.C.C of a synchronous generator.
12. To plot V-curve of a synchronous motor.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- III
EE(W)-223 : ELECTRICAL WORKSHOP
(COMMON TO EE, ECE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Introduction of tools, electrical materials, symbols and abbreviations.
2. To study stair case wiring.
3. To study house wiring i.e., batten, cleat, casing-caping and conduit wirings.
4. To study fluorescent tube light.
5. To study high pressure mercury vapour lamp (H.P.M.V).
6. To study Sodium lamp.
7. To study repairing of home appliances such as heater, electric iron, fans etc.
8. To study construction of moving iron, moving coil, electrodynamic & induction type meters.
9. To design & fabricate single phase transformer.
10. To study fuses, relays, contactors, MCBs and circuit breakers.
11. Insulation testing of electrical equipments.
12. To design, fabricate a PCB for a circuit, wire-up and test.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- III
ECE(W)-221 : DIGITAL ELECTRONICS LAB
(COMMON TO ECE, EE, CSE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.

2. Design & realize a given function using K-maps and verify its performance.

3. To verify the operation of multiplexer & Demultiplexer.

4. To verify the operation of comparator.

5. To verify the truth tables of S-R, J-K, T & D type flip flops.

6. To verify the operation of bi-directional shift register.

7. To design & verify the operation of 3-bit synchronous counter.

8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.

9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flip-flops & drive a seven-segment display using the same.

10. To design & realize a sequence generator for a given sequence using J-K flip-flops.

11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.

12. Design a 4-bit shift-register and verify its operation . Verify the operation of a ring counter and a Johnson counter.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- III
ECE(W)-223 : COMMUNICATION SYSTEMS LAB
(COMMON TO ECE,EE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Study of Amplitude Modulation and determination of Modulation index.

2. Study of Frequency Modulation and determination of Modulation index.

3. Study of Phase Modulation.

4. Study of Pulse Amplitude Modulation.

5. Study of Pulse Width Modulation.

6. Study of Pulse Frequency Modulation.

7. Study of Pulse Code Modulation.

8. Study of frequency Shift Keying.

9. Study of ASK and QASK.

10. Study of PSK and QPSK.

11. Project related to the scope of the course.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-202: COMMUNICATION ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 SPECTRAL ANALYSIS :
Fourier Series, Fourier tranforms, Convolution Theorem, Correlation, Cross-Correlation and autocorrelation.

UNIT 2 INFORMATION THEORY :
Introduction to information and entropy, channel capacity for discrete and continuous channels, Shannon's Theorem, Shannon-Hartley Theorem, Noisy channels, coding theory : Shannon-Fano coding, minimum redundance coding, maximization of entropy of a continuous message transmission rate, effect of medium on the information, selection of channels ,effect of noise and its minimization.

UNIT 3 RANDOM SIGNAL THEORY :
Representation of random signals, concept of probability, probability of joint occurrence, conditional probability, discrete probability theory, continuous random variables, probability distribution function, probability density function, joint probability density functions. Statistical average and moments, Ergodic processes, correlation function, power spectral density, central limit theory, response of linear system to random signals. Error function, regularity, covariance relation among the spectral densities of the two input-output random processes. Cross spectral densities, optimum filters.

TEXT BOOK :
1. Principles of Communication Systems : Taub Schiling; TMH

REFERENCE BOOKS.
1. Communication Systems : Singh and Sapre ; TMH
2. Communication Systems : A Bruce Carlson; TMH

NOTE: Eight questions are to be set, at least two from each unit. Students have to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-204 : ELECTRONIC MEASUREMENT AND INSTRUMENTATION
(COMMON TO ECE,EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. OSCILLOSCOPE:
Block diagram, study of various stages in brief, high frequency CRO considerations. Sampling and storage oscilloscope.

UNIT 2. ELECTRONIC INSTRUMENTS:
Instruments for measurement of voltage, current & other circuit parameters, Q-meters, R.F. power measurements, introduction to digital meters.

UNIT 3. GENERATION & ANALYSIS OF WAVEFORMS:
Block diagram of pulse generators, signal generators, function generators wave analysers, distortion analysers, spectrum analyser, Harmonic analyser, introduction to power analyser.

UNIT 4. FREQUENCY & TIME MEASUREMENT:
Study of decade counting Assembly(DCA), frequency measurements, period measurements, universal counter, introduction to digital meters.

UNIT 5. DISPLAY DEVICES:
Nixie tubes, LED's LCD's, discharge devices.

UNIT 6 TRANSDUCERS:
Classification, Transducers of types: RLC photocell, thermocouples etc. basic schemes of measurement of displacement, velocity, acceleration, strain, pressure, liquid level & temperature.

UNIT 7 INTRODUCTION TO SIGNAL CONDITIONING:
DC signal conditioning system, AC signal conditioning system, data acquisition and conversion system

TEXT BOOK:
1. A course in Electrical & Electronics Measurements & Instrumentation: A.K.Sawhney; Dhanpat Rai & Sons.

REFERENCE BOOKS.

1. Electronics Instrumentation & Measurement Techniques : Cooper; PHI.

NOTE: Eight questions are to be set – at least one from each unit. Students have to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-206 : ANALOG ELECTRONIC CIRCUITS
(COMMON TO ECE, EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. SINGLE AND MULTISTAGE AMPLIFIERS:
Classification of amplifiers, distortion in amplifiers, frequency response of an amplifier, step response of an amplifier, pass-band of cascaded stages, RC-coupled amplifier, low frequency response of RC coupled stage, effect of an emitter bypass capacitor on low Frequency response, multistage CE amplifier .

UNIT2. FEEDBACK AMPLIFIERS :
Feedback concept, transfer gain with feedback, general characteristics of negative feedback amplifiers, input resistance, output resistance, voltage series feedback, current series feedback, current shunt feedback, voltage shunt feedback.

UNIT3. OSCILLATORS:
Sinusoidal oscillators, Barkhausen criteria, R-C phase shift oscillator, generalform of oscillator circuit, wien-bridge oscillator, crystal oscillator.

UNIT4. POWER AMPLIFIERS:
Class A, B, and C operations; Class A large signal amplifiers, higher order harmonic distortion, efficiency, transformer coupled power amplifier, class B amplifier : efficiency & distortion; class A and class B push-pull amplifiers; class C power amplifier.

UNIT5. OPERATIONAL AMPLIFIERS :
Ideal and practical operational amplifiers, inverting and non-inverting amplifier, differential amplifier, emitter coupled differential amplifier, transfer characteristics of a differential amplifier, offset error : voltage and current, common mode rejection ratio (CMRR) .

UNIT6. LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIERS :
Scale changer, phase shifter, adder, voltage to current converter, current to voltage converter, DC voltage follower, Bridge amplifier, AC coupled amplifier, AC voltage follower, Integrator, differentiator.

UNIT7. NON-LINEAR APPLICATIONS OF OPERATIONAL AMPLIFIERS :
Comparators, sample & hold circuits, Logarithmic amplifier, anti-log amplifier, logarithmic multiplier, waveform generators , Miller & Bootstrap sweep generators, regenerative comparator (Schmitt Trigger), multivibrators, ADC.

TEXT BOOK:
1. Integrated Electronics: Milman Halkias, TMH.
2. Microelectronic Circuits : Sedra & Smith.

REFERENCE BOOKS:
1. Operational Amplifiers:Gaikwad
2. Electronic Circuit Analysis and Design (Second edition) : D.A.Neamen; TMH

NOTE: Eight questions are to be set – at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-208 : ANTENNA AND WAVE PROPAGATION

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. RADIATION OF ELECTROMAGNETIC WAVES :
Retarded potential, field of short dipole, Antenna pattern & antenna parameters.

UNIT 2. ANTENNA PARAMETERS :
Antenna pattern, Gain, Directivity, Radiation resistance, Aperture, Beam-width etc, Reciprocity theorem for antenna.

UNIT 3. ELEMENTAL ANTENNA:
Wave equation for radiated fields from current and voltage sources in terms of electric scalar potential and magnetic vector potential .Fields and pattern of an infinitesimal dipole. Definition of various potentials used in antenna theory .

UNIT 4. PRACTICAL LINEAR ANTENNAS:
Relation between current distribution and field pattern of an antenna, linear antenna, half wave dipole, Antenna impedance, Directivity, Radiation resistance, Directional properties, Effect of ground on antenna pattern, Input impedance Broad band matching. Mutual impedance .

UNIT 5. ANTENNA ARRAYS :
Two element array, broad side, End fired pattern, Beam width pattern multiplication, multi element array and their properties, Synthesis of an array.

UNIT 6. VARIOUS TYPES OF ANTENNA :
parabolic feeds, conical, helix, log periodic, horn, Microwave antenna .

UNIT 7. PROPAGATION :
Ground waves, Space waves, Effect of Earth, Duct formation, Ionosphere, and sky waves.

TEXT BOOKS : 1. Antennas by J.D.Kraus, TMH.
2. Antenna & Wave Propagation by K.D Prasad.

REF. BOOKS : 1.Antenna & Radiowave Propogation by Collin,TMH
2.Electromagnetic Waves & Radiating Systems by Jordan & Balman, PHI.

NOTE : Eight questions are to be set - at least one question from each unit. Students have to attempt five question in all.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-226 : ANALOG ELECTRONIC CIRCUITS LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Design & measure the frequency response of an RC coupled amplifier using discrete components.
2. Design a two stage RC coupled amplifier and determine the effect of cascading on gain and bandwidth
3. Study the effect of voltage series, current series, voltage shunt, and current shunt feed-back on amplifier using discrete components.
4. Design & realize inverting amplifier, non-inverting and buffer amplifier using 741 Op Amp.
5. Verify the operation of a differentiator circuit using 741 op amp and show that it acts as a high pass filter.
6. Verify the operation of a integrator circuit using 741 op amp and show that it acts as a low pass filter.
7. Design and verify the operations of op amp adder and subtractor circuits.
8. Plot frequency response of AC coupled amplifier using op amp 741 and study the effect of negative feedback on the bandwidth and gain of the amplifier.
9. Design & realize using op amp 741, Wein -bridge oscillator.
10. To design & realize using op amp 741, square wave generator.
11. To design & realize using op amp 741, logarithmic amplifier & VCCS.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-224 : ELECTRONIC MEASUREMENT AND INSTRUMENTATION LAB
(COMMON TO ECE, EE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Measurement of displacement using LVDT.
2. Measurement of distance using LDR.
3. Measurement of temperature using R.T.D.
4. Measurement of temperature using Thermocouple.
5. Measurement of pressure using Strain Guage.
6. Measurement of pressure using Piezo-Electric Pick up.
7. Measurement of distance using Capacitive Pick up.
8. Measurement of distance using Inductive Pick up.
9. Measurement of speed of DC Motor using Magnetic Pick up.
10. Measurement of speed of DC Motor using Photo Electric Pick up.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- IV
ECE(W)-232 : ELECTRONICS CIRCUIT SIMULATION LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS

1. Simulate and study half-wave, full-wave, and bridge-rectifier using PSPICE windows
2. Simulate and study diode clipper and clamper circuits using PSPICE windows
3. Simulate and study emitter bias and fixed bias BJT and JFET circuits using PSPICE windows, and determine quiescent conditions.
4. Simulate a common emitter amplifier using self biasing and study the effect of variation in emitter resistor on voltage gain , input and output impedance using PSPICE windows .
5. Determine the frequency response of Vo/Vs for CE BJT amplifier using PSPICE windows. Study the effect of cascading of two stages on band width.
6. Simulate and study Darlington pair amplifier circuit using PSPICE windows and determine dc bias and output ac voltage .
7. Study an operational amplifier using PSPICE windows and find out: CMMR, gain band width product, slew rate, 3-db frequency, and input offset voltage.
8. Simulate and study active low pass, high pass, and band pass filters using PSPICE windows.
9. Simulate and study class A, B, C, and AB amplifier using PSPICE windows.
10. Study the operation of 555 timer oscillator using PSPICE.
11. Simulate logic expression……..and determine its truth table.
12. Simulate logic expression of full adder circuit and determine its truth table.
13. Simulate a synchronous 4-bit counter and determine its count sequence.
14. Simulate a master-slave flip-flop using NAND gates and study its operation. Study the operation of asynchronous preset and clear .

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- V
ECE(W)-301 : MICROWAVE AND RADAR ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. WAVEGUIDES:
Introduction, comparison with transmission lines, propagation in TE & TM mode, rectangular wave guide, TEM mode in rectangular wave guide, characteristic impedance, introduction to circular waveguides and planar transmission lines.

UNIT2 . MICROWAVE COMPONENTS:
Directional couplers, tees, hybrid ring, S-parameters, attenuators, cavity resonators ,mixers & detectors, matched Load, phase shifter ,wave meter, Ferrite devices: Isolators, circulators.

UNIT3. MICROWAVE TUBES:
Limitation of conventional tubes; Construction, operation and properties of Klystron amplifier, reflex Klystron, magnetron, TWT , BWO , crossed field amplifiers.

UNIT4. MICROWAVE SOLID STATE DEVICES :
Varactor diode, Tunnel diode, Schottky diode, GUNN diode, IMPATT, TRAPATT and PIN diodes. MASER, parametric amplifiers.

UNIT5. MICROWAVE MEASUREMENTS :
Power measurement using calorimeter & bolometers, measurement of SWR, frequency , wavelength and impedance. Microwave bridges.

UNIT6. INTRODUCTION TO RADAR :
Block Diagram and operation, Radar Frequencies, Simple form of Radar Equation, Prediction of Range Performance, Pulse Repetition frequency and Range Ambiguities, Applications of Radar

TEXT BOOKS:
1. Microwave devices and circuits :Samuel Liao;PHI
2. Microwave devices & Radar Engg :M .Kulkarni;Umesh

REFERENCE BOOK :
1. Microwaves and Radar : A.K. Maini; Khanna

NOTE : Eight questions are to be set –atleast one from each unit. Students have to attempt any five questions

B.TECH. WEEKEND SEMESTER- V
ECE(W)-303: MICROPROCESSORS AND INTERFACING
(COMMON TO ECE, CSE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

PART A

UNIT1. THE 8085 PROCESSOR :
Introduction to microprocessor, 8085 microprocessor : Architecture, instruction set, interrupt structure, and assembly language programming.

UNIT2. THE 8086 MICROPROCESSOR ARCHITECTURE :
Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

UNIT3. INSTRUCTION SET OF 8086 :
Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

PART B

UNIT4. INTERFACING DEVICE :
The 8255 PPI chip: Architecture, control words, modes and examples.

UNIT 5. DMA :
Introduction to DMA process, 8237 DMA controller,

UNIT6. INTERRUPT AND TIMER :
8259 Programmable interrupt controller, Programmable interval timer chips.

TEXT BOOKS :
1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

REFERENCE BOOKS:
1. Microprocessors and interfacing : Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn A Gibson; PHI.
4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

NOTE : 8 questions are to be set selecting FIVE questions from PART A and THREE questions from PART B. Students have to attempt any five questions.

B.TECH. WEEKEND SEMESTER- V
EE(W)-303 : CONTROL SYSTEM ENGINEERING
(COMMON TO EE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. INTRODUCTORY CONCEPTS :
System/Plant model, types of models, illustrative examples of plants and their inputs and outputs, controller, servomechanism, regulating system, linear time-invariant (LTI) system, time-varying system, causal system, open loop control system, closed loop control system, illustrative examples of open-loop and feedback control systems, continuous time and sampled data control systems. Effects of feedback on sensitivity (to parameter variations), stability, external disturbance (noise), overall gain etc. Introductory remarks about non-linear control systems.

UNIT2. MATHEMATICAL MODELLING :
Concept of transfer function, relationship between transfer function and impulse response, order of a system, block diagram algebra, signal flow graphs : Mason's gain formula & its application, characteristic equation, derivation of transfer functions of electrical and electromechanical systems. Transfer functions of cascaded and non-loading cascaded elements. Introduction to state variable analysis and design.

UNIT3. TIME DOMAIN ANALYSIS:
Typical test signals, time response of first order systems to various standard inputs, time response of 2nd order system to step input, relationship between location of roots of characteristics equation, w and wn, time domain specifications of a general and an under-damped 2nd order system, steady state error and error constants, dominant closed loop poles, concept of stability, pole zero configuration and stability, necessary and sufficient conditions for stability, Hurwitz stability criterion, Routh stability criterion and relative stability.

UNIT4. ROOT LOCUS TECHNIQUE:
Root locus concept, development of root loci for various systems, stability considerations.

UNIT5. FREQUENCY DOMAIN ANALYSIS:
Relationship between frequency response and time-response for 2nd order system, polar, Nyquist, Bode plots, stability, Gain-margin and Phase Margin, relative stability, frequency response specifications.

UNIT6. COMPENSATION:
Necessity of compensation, compensation networks, application of lag and lead compensation, basic modes of feedback control, proportional, integral and derivative controllers, illustrative examples.

UNIT7. CONTROL COMPONENTS : Synchros, AC and DC techo-generators, servomotors, stepper motors, & their applications, magnetic amplifier.

TEXT BOOK :
1. Control System Engineering : I.J.Nagrath & M.Gopal; New Age

REFERENCE BOOKS :
1. Automatic Control Systems : B.C.Kuo, PHI.
2. Modern Control Engg : K.Ogata; PHI.
3. Control Systems - Principles & Design : Madan Gopal; Tata Mc Graw Hill.
4. Modern Control Engineering.R.C.Dorl & Bishop; Addison-Wesley

NOTE: Eight questions are to be set - at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- V
CSE(W)-305: COMPUTER NETWORKS
(COMMON TO CSE, ECE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Unit-1: OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular – Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Unit–2: TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Unit-3: Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Unit–4: Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.

Unit-5: Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

Text Book:

- Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

Reference Books:

- Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
- Business Data Communications, Fitzgerald Jerry,.
- Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2nd Edition
- Computer Networking – ED Tittel , 2002, T.M.H.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- V
EE(W)-323: CONTROL SYSTEM ENGG. LAB
(COMMON TO EE, ECE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1. To study A.C. servo motor and to plot its torque speed characteristics.
2. To study D.C. servo motor and to plot its torque speed characteristics.
3. To study the magnetic amplifier and to plot its load current v/s control current characteristics for :
   (a) series connected mode
   (b) parallel connected mode.
4. To plot the load current v/s control current characteristics for self exited mode of the magnetic amplifier.
5. To study the synchro & to:
   (a) Use the synchro pair (synchro transmitter & control transformer) as an error detector.

   (b)Plot stator voltage v/s rotor angle for synchro transmitter i.e. to use the synchro transmitter as position transducer.
6. To use the synchro pair (synchro transmitter & synchro motor) as a torque transmitter.
7. (a) To demonstrate simple motor driven closed loop position control system.
   (b) To study and demonstrate simple closed loop speed control system.
8. To study the lead, lag, lead-lag compensators and to draw their magnitude and phase plots.
9. To study a stepper motor & to execute microprocessor or computer-based control of the same by changing number of steps, direction of rotation & speed.
10. To implement a PID controller for level control of a pilot plant.
11. To implement a PID controller for temperature control of a pilot plant.
12. To study the MATLAB package for simulation of control system design.

Note:
1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- V
ECE(W)-323: MICROPROCESSORS AND INTERFACING LAB
(COMMON TO ECE, CSE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :
    a. Addition of two 8-bit numbers.
    b. Addition of two 8-bit numbers (with carry).
3. Write a program using 8085 and verify for :
    a. 8-bit subtraction (display borrow)
    b. 16-bit subtraction (display borrow)
4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.
6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.
7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.
8. Study of 8086 microprocessor kit
9. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double Word division and verify.
10. Write a program using 8086 for finding the square root of a given number and verify.
11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.
12. Write a program using 8086 and verify for:
    a. Finding the largest number from an array.
    b. Finding the smallest number from an array.
13. Write a program using 8086 for arranging an array of numbers in descending order and verify.
14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.
15. Write a program for finding square of a number using look-up table and verify.
16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.
17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- V

CSE(W)-325 : NETWORK PROGRAMMING LAB.

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

The socket programming can be done on Unix/Linux operating or/and Windows. Socket programming, and the language can be C/VC++ and/or Java

1. Write a program to Create Sockets For Sending And Receiving Data.
2. Write a program to Obtain The Local & Remote Socket Address.
3. Write a program to Create Sockets For Handling Multiple Connection
4. Write a program to Obtain The Information About The (A) Host (B) Network (C) Protocols (D) Domains
5. Write a program to Manipulate The IP Address.
6. Write a program to Write A Telnet Client.
7. Write a program to Make An FTP Client

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- V
ECE(W)-321 : MICROWAVE LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1. Study of wave guide components.
2. To study the characteristics of reflex Klystron and determine its timing range.
3. To measure frequency of microwave source and demonstrate relationship among guide dimensions, free space wave length and guide wavelength.
4. To measure VSWR of unknown load and determine its impedance using a smith chart.
5. To match impedance for maximum power transfer using slide screw tuner.
6. To measure VSWR, insertion losses and attenuation of a fixed and variable attenuator.
7. To measure coupling and directivity of direction couplers.
8. To measure insertion loss, isolation of a three port circulator.
9. To measure the Q of a resonant cavity.
10. To study the V-I characteristics of GUNN diode.

Note:
1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- VI
ECE(W)-302: MOS IC'S AND TECHNOLOGY

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. REVIEW OF MOS TECHNOLOGY :
Introduction to IC technology, MOS Transistor enhancement mode and depletion mode operations, fabrication of NMOS, CMOS and BiCMOS devices. Equivalent circuit for MOSFET and CMOS.

UNIT2. MOS TRANSISTOR THEORY:
MOS device design equations, MOS transistor, Evaluation aspects of MOS transistor, threshold voltage, MOS transistor transconductance & output conductance, figure of merit, determination of pull-up to pull-down ratio for an n-MOS inverter driven by another n-MOS inverter & by one or more pass transistor, alternative forms of pull-up, CMOS and BiCMOS-inverters. Latch up in CMOS circuitry and BiCMOS Latch up susceptibility.

UNIT3. MOS CIRCUITS AND LOGIC DESIGN :
Basic physical design of simple logic gates using n-MOS, p-MOS and CMOS, CMOS logic gate design considerations, CMOS logic structures, clocking strategies.

UNIT4. CIRCUIT CHARACTERIZATION AND PERFORMANCE ESTIMATION :
Resistance estimation, capacitance estimation, inductance, switching characteristics, CMOS gate transistor sizing, power dissipation.

UNIT5. VLSI FABRICATION :
Crystal growth, wafer preparation, epitaxy, oxidation, lithography, etching, diffusion, dielectric and poly-silicon film deposition, ion implantation, yield and reliability, metalization.

UNIT6. DESIGN EXAMPLE USING CMOS :
Incrementer / decrementer, left/right shift serial/parallel register, comparator for two n-bit number, a two-phase non-overlapping clock generator with buffered output on both phases, design of an event driven element for EDL system

TEXT BOOKS :
1. Introduction to Digital Integrated Circuits : Rabaey,Chandrakasan & Nikolic.
2. Principles of CMOS VLSI Design : Neil H.E. Weste and Kamran Eshraghian; Pearson.

REFERENCE BOOKS :
1. Introduction to Digital Circuits : Rabaey and ……..LPE (PH)
2. ……: S.K.Gandhi.
3. VLSI Technology: S.M. Sze; McGraw-Hill.
4. Integrated Circuits: K.R. Botkar; Khanna

NOTE: Eight questions are to be set –atleast one from each unit. Students have to attempt any five questions

B.TECH. WEEKEND SEMESTER- VI
ECE(W)-304 : DIGITAL SYSTEM DESIGN
(COMMON TO ECE, EE, CSE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. INTRODUCTION :
Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, logical operators.Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

UNIT 2. VHDL STATEMENTS :
Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.
Subprograms: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

UNIT 3. COMBINATIONAL CIRCUIT DESIGN:
VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

UNIT 4. SEQUENTIAL CIRCUITS DESIGN :
VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

UNIT 5. DESIGN OF MICROCOMPUTER :
Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

UNIT 6. DESIGN WITH CPLDs AND FPGAs :
Progr ammable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

REFERENCE BOOKS:

1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDL and Synthesis : KC Chang; IEEE Computer Society Press.
3. "A VHDL Primmer" : Bhasker; Prentice Hall 1995.
4. "Digital System Design using VHDL" : Charles. H.Roth ; PWS (1998).
5. "VHDL-Analysis & Modelling of Digital Systems" : Navabi Z; McGraw Hill.
6. VHDL-IV Edition :Perry; TMH (2002)
7. "Introduction to Digital Systems" : Ercegovac. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
9. Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).

NOTE : Eight questions are to be set - at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- VI
ECE(W)-306 : SIGNALS & SYSTEMS

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

Unit-I : Signals and Systems
Continuous-time and discrete-time Signals, Transformations of the Independent Variable, Exponential and Sinusoidal Signals, Continuous-Time and Discrete-Time LTI Systems and their properties, convolution sum and convolution integrals, LTI System described by differential and difference equation.

Unit-II : Fourier Series and Fourier Transform
The response of LTI Systems to Complex Exponentials, Fourier Series, Representation of Continuous-time Periodic Signals and their Properties, Continuous time and discrete time Fourier Transforms and their properties, System Characterized by Linear Constant Coefficient Differential equations and Difference equation.

Unit-III : Time and Frequency Characterization of Signals and Systems
Magnitude Phase Representation of the Fourier Transform, Magnitude Phase, Representation of the Frequency response of LTI systems, Time domain Properties of Ideal Frequency Selective filter, Time Domain and Frequency Domain aspects of Non ideal filters, First Order and Second Order Continuous Time and Discrete time Systems.

Unit-IV : Sampling and Laplace Transform
Signal representation by samples, sampling theorem, Impulse train sampling, sampling of discrete time signals, discrete time processing of continuous time signals. Laplace Transform, Region of convergence, inverse Laplace Transform, Analysis and characterization of LTI System, Block diagram representation, Unilateral Laplace transform, Bilateral LT, Regions of convergence (ROC).

Unit-V : Z-Transform
Z-Transform, Region of convergence, Inverse Z-transform, analysis and characterization of LTI system, Block diagram representation, Unilateral Z-transform.

Text Book
1. V. Oppenheim, A.S. Willsky and S. Hamid Nawab, 'signals & System', PEARSON Education, Second Edition, 2003.

Reference Book
1. Roberts, "Signals and Systems" TATA McGraw Hills.
2. P. Ramesh Babu, R. Ananda Natarajan, ."Signals and Systems", SCITECH Publications.
3. Charles L. Phillips, John M.PARR and EVEA. RISKIN, "Signals, Systems and Transforms", PEARSON Education, Third Edition.
4. Chen 'Signals & Systems, Oxford University, Press.

Note: Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all.

B.TECH. WEEKEND SEMESTER- VI
ECE(W)-308 : DATA COMMUNICATION
(COMMON TO ECE, EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 DIGITAL COMMUNICATION :
Introduction, digital communication, Shannon limit for information capacity, digital radio, digital amplitude modulation, frequency shift keying (FSK), phase shift keying (PSK), quadrature amplitude modulation (QAM), band width efficiency, carrier recovery, differential phase shift keying,(DPSK), clock recovery, probability of error & bit error rate, trellis encoding.

UNIT 2 DATA COMMUNICATIONS:
Introduction, history of data communication, standard organization for data communication, data communication circuits, data communication codes, error control, synchronization, data communications hardware, serial interfaces: RS-232, RS-449 & RS-530, CCITT X.21, parallel interfaces: centronics parallel interfaces. the telephone network: DDD network, private-line service, the telephone circuit, data modems: synchronous modems, asynchronous modems, modem synchronization.

UNIT 3 DATA COMMUNICATIONS PROTOCOLS AND NETWORK CONFIGURATIONS :
Introduction, open system interconnection (OSI), data transmission mode, asynchronous protocols, synchronous protocols, public data network, integrated services digital network (ISDN), local area networks, token pass ring, Ethernet.

UNIT 4 MULTIPLEXING :
Introduction, time division multiplexing, T1 digital carrier system, CCITT time division multiplexed carrier systems, CODECS, COMBO chips, line encoding, T-CARRIERS, frame synchronization, bit interleaving VS word interleaving, frequency division multiplexing, AT&T's FDM hierarchy, composite base band signal, formation of a master group.

UNIT 5 INTERNET AND TCP/IP:
Introduction, history, use of Internet, accessing the Internet, Internet addresses, security on the internet, authentication, firewalls, intranet and extranet, TCP/IP reference model, domain name service, world wide web.

TEXT BOOK:
1. Electronic Communications Systems (4th Ed.) : Wayne Tomasi; Pearson
2. Data Communication and Networking (2nd -edition): Forauzan;

NOTE: Eight questions are to be set at-least one from each unit. Students have to attempt any five questions

B.TECH. WEEKEND SEMESTER- VI
ECE(W)-328 : DATA COMMUNICATION LAB
(COMMON TO ECE, EE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1) To study different types of transmission media

2) To study Quadrature Phase Shift Keying Modulation.

3) To study Quadrature Amplitude Modulation.

4) To Study !6 Quadrature Amplitude Multiplexing.

5) To Study Serial Interface RS-232 and its applications.

6) To study the Parallel Interface Centronics and its applications.

7) To configure the modem of a computer.

8) To make inter-connections in cables for data communication in LAN.

9) To install LAN using Tree topology.

10) To install LAN using STAR topology.

11) To install LAN using Bus topology.

12) To install LAN using Token-Ring topology

13) To install WIN NT

14) To configure a HUB/Switch.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- VI
DIGITAL SYSTEM DESIGN LAB
(COMMON TO ECE, CSE)

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1. Design all gates using VHDL.

2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. half adder
   b. full adder

3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. multiplexer
   b. demultiplexer

4. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. decoder
   b. encoder

5. Write a VHDL program for a comparator and check the wave forms and the hardware generated

6 Write a VHDL program for a code converter and check the wave forms and the hardware generated

7. Write a VHDL program for a FLIP-FLOP and check the wave forms and the hardware generated

8. Write a VHDL program for a counter and check the wave forms and the hardware generated

9. Write VHDL programs for the following circuits, check the wave forms and the hardware generated
   a. register
   b. shift register

10. Implement any three (given above) on FPGA/CPLD kit

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus.

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-401 : DIGITAL SIGNAL PROCESSING
(COMMON TO ECE, EE)

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. DISCRETE-TIME SIGNALS:
Signal classifications, frequency domain representation, time domain representation, representation of sequences by Fourier transform, properties of Fourier transform, discrete time random signals, energy and power theorems.

UNIT2. DISCRETE-TIME SYSTEMS : Classification, properties, time invariant system, finite impulse Response (FIR) system, infinite impulse response (IIR) system.

UNIT3. SAMPLING OF TIME SIGNALS:
Sampling theorem, application, frequency domain representation of sampling, reconstruction of band limited signal from its samples. discrete time processing of continuous time signals, changing the sampling rate using discrete time processing.

UNIT4. Z-TRANSFORM :
Introduction, properties of the region of convergence, properties of the Z-transform, inversion of the Z-transform, applications of Z-transform.

UNIT5. BASICS OF DIGITAL FILTERS : Fundamentals of digital filtering, various types of digital filters, design techniques of digital filters : window technique for FIR, bi-linear transformation and backward difference methods for IIR filter design, analysis of finite word length effects in DSP, DSP algorithm implementation consideration. Applications of DSP.

UNIT6. MULTIRATE DIGITAL SIGNAL PROCESSING:
Introduction to multirate digital signal processing, sampling rate conversion, filter structures, multistage decimator and interpolators, digital filter banks.

TEXT BOOKS :
1. Digital Signal Processing : Proakis and Manolakis; PHI
2. Digital Signal Processing: Salivahanan, Vallavaraj and Gnanapriya;TMH

REFERENCE BOOKS:
1. Digital Signal Processing: Alon V. Oppenhelm;PHI
2. Digital Signal processing(II-Edition): Mitra, TMH

NOTE: Eight questions are to be set - at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-403 : EMBEDDED SYSTEMS DESIGN

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 : INTRODUCTION
Different types of microcontrollers: Embedded microcontrollers, External memory microcontrollers; Processor Architectures: Harvard V/S Princeton , CISC V/S RISC; microcontrollers memory types; microcontrollers features : clocking, i/o pins, interrupts, timers, peripherals.

UNIT 2 : MICROCONTROLLER ARCHITECTURE
Introduction to PIC microcontrollers, Architecture and pipelining, program memory considerations, Addressing modes, CPU registers, Instruction set, simple operations.

UNIT 3 : INTERRUPTS AND I/O PORTS
Interrupt logic, Timer2 scalar initialization, IntService Interrupt service routine, loop time subroutine, External interrupts and timers, Synchronous serial port module, Serial peripheral device, O/p port Expansion, I/p port expansion, UART.

UNIT 4 : SOFTWARE
Development tools/ environments, Assembly language programming style, Interpreters, High level languages, Intel hex format object files, Debugging.

UNIT 5 : PROGRAMMING WITH MICROCONTROLLERS
Arithmetic operations, Bit addressing, Loop control, Stack operation, Subroutines, RAM direct addressing, state machines, Oscillators, Timer Interrupts, Memory mapped I/O.

UNIT 6 : DESINING USING MICROCONTROLLERS
Music box, Mouse wheel turning, PWM motor control, Aircraft Demonstration, ultra sonic distance measuring, Temperature Sensor, Pressure Sensor, Magnetic Field Sensor.

TEXT BOOK:
1. Design with PIC Microcontrollers by John B. Peatman , Pearson.

REFERENCE BOOKS :
1. Programming and Customizing the 8051 Microcontroller : Predko ; TMH.
2. Designing Embedded Hardware : John Catsoulis ;SHROFF PUB. & DISTR. ND.
3. Programming Embedded Systems in C and C++ : Michael Barr; SHROFF PUB. & DISTR. ND.

NOTE: Eight questions are to be set at-least one from each unit. Students have to attempt any five questions

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-405 : WIRELESS COMMUNICATION

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS:
Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

UNIT 2. MODERN WIRELESS COMMUNICATION SYSTEMS:
Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

UNIT 3. INTRODUCTION TO CELLULAR MOBILE SYSTEMS:
Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

UNIT 4. CELLULAR SYSTEM DESIGN FUNDAMENTALS:
Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

UNIT 5. MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION:
Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

UNIT 6. WIRELESS NETWORKING:
Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.

UNIT 7. INTELLIGENT CELL CONCEPT AND APPLICATION:
Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

TEXT BOOKS:

1. Wireless Communications: Theodore S. Rappaport; Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill

REFERENCE BOOK:

1. Mobile Communications: Jochen Schiller; Pearson

NOTE: Eight questions are to be set -one question from each unit. Students have to attempt any five question.

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-425 : PROJECT

L	P	Credits
-	1	4

Class Work : 50 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

The primary objective of this course is to develop in students the professional quality of synthesis employing technical knowledge obtained in the field of Engineering & Technology through a project work involving design, analysis augmented with creativity, innovation and ingenuity.

Project involving design/ fabrication/ testing/ computer simulation/ case studies etc. which commences in the VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairperson of Department	**: Chairperson**
Project coordinator	**: Member Secretary**
Respective project supervisor	**: Member**

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 1 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-421 : DIGITAL SIGNAL PROCESSING LAB
(COMMON TO ECE, EE)

L	P	Credits			
-	2	2	Class Work	:	25
			Exam	:	25
			Total	:	50
			Duration of Exam	:	3 HRS

LIST OF PRACTICALS / DEMONSTRATIONS:

Perform the experiments using MATLAB:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To design analog filter (low-pass, high pass, band-pass, band-stop).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop).
8. To design FIR filters using windows technique.
9. To design a program to compare direct realization values of IIR digital filter
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter
12. To develop a program for computing inverse Z-transform of a rational transfer function.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus

B.TECH. WEEKEND SEMESTER- VII
ECE(W)-423 : EMBEDDED SYSTEMS DESIGN LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

8051 Micro Controller

1. Write an Assembly language Programme (ALP) to generate 10kHz square wave.
2. Write an ALP to generate 10 kHz frequency using interrupts.
3. Write an ALP to interface one Microcontroller with other wring serial/parallel communication.
4. Write an ALP for temperature & pressure measurement & to display on intelligent LCD display

PIC Microcontroller

5. Write an ALP for PWM based speed control of motor .
6. Write an ALP for PWM based regulator of voltage.
7. Write an ALP to send/receive the data from an computer to MC through serial communication

General

8. Study of Development tools/environment for Microcontroller Programme.
9. Develop an embedded system for traffic light controller using Micro controller
10. Develop an embedded system for the automatic motion of a car (Model of car) & Subsequent display on LCD using Microcontroller..

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-402 : SATELLITE COMMUNICATION ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1. PRINCIPLES OF SATELLITE COMMUNICATION:
Evolution & growth of communication satellite, Synchronous satellite, Satellite frequency allocation & Band spectrum, Advantages of satellite communication, Active & Passive satellite, Modem & Codec. Applications of satellite communication.

UNIT2. COMMUNICATION SATELLITE LINK DESIGN:
Introduction, General link design equations, System noise temperature, C/N & G/T ratio, Atmospheric & Ionospheric effects on link design, Complete link design, Earth station parameters.

UNIT3. ANALOG SATELLITE COMMUNICATION :
Introduction, Baseband analog(Voice) signal, FDM techniques, S/N & C/N ratio in frequency modulation in satellite link, S/N ratio in FM with multiplexed telephone signal in satellite link, Single channel per carrier(SCPC) systems, Companded single sideband (CSSB) systems, Analog FM/FDM TV satellite link, Intermodulation products & their effects in FM/FDM systems, Energy disposal in FM/FDM systems.

UNIT4. DIGITAL SATELLITE COMMUNICATION :
Advantages of digital communication, Elements of digital satellite communication systems, Digital baseband signals, Digital modulation techniques, Satellite digital link design, Time Division Multiplexing.

UNIT5. MULTIPLE ACCESS TECHNIQUES: Introduction, TDMA, TDMA-Frame structure, TDMA-Burst structure, TDMA-Frame efficiency, TDMA-superframe, TDMA-Frame acquisition & Synchronization, TDMA compared to FDMA, TDMA Burst Time Plan, Multiple Beam (Satellite switched) TDMA satellite system, Beam Hopping(Transponder Hopping) TDMA, CDMA & hybrid access techniques.

UNIT6. SATELLITE ORBITS:
Introduction, Synchronous orbit, Orbital parameters, Satellite location with respect to earth, Look angles, Earth coverage & slant range, Eclipse effect, Satellite placement in geostationary orbit, station keeping, Satellite stabilization.

UNIT7. SPECIAL PURPOSE COMMUNICATION SATELLITES :
BDS, INMARSAT, INTELSAT, VSAT(data broadband satellite), MSAT(Mobile Satellite Communication technique), Sarsat(Search & Rescue satellite) & LEOs (Lower earth orbit satellite), Satellite communication with respect to Fiber Optic Communication, LANDSAT, Defense satellite.

UNIT8. LASER SATELLITE COMMUNICATION:
Introduction, Link analysis, Optical satellite link transmitter, Optical satellite link receiver, Satellite Beam Acquisition, Tracking & Positioning, Deep Space Optical Communication Link.

TEXT BOOK:
1. Satellite Communication : D.C. Aggarwal ; Khanna.

REFERENCE BOOK :
1. Satellite Communication :Gagliardi ; CBS

NOTE: Eight questions are to be set - one question from each unit. Students have to attempt any five question.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-404 : OPTICAL COMMUNICATION SYSTEMS

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1 INTRODUCTION TO OPTICAL COMMUNICATION SYSTEMS :
Electromagnetic spectrum used for optical communication, block diagram of optical communication system. Basics of transmission of light rays. Advantages of optical fiber communication.

UNIT2 OPTICAL FIBERS:
Optical fibers structures and their types, fiber characteristics : attenuation, scattering, absorption, fiber bend loss, dispersion; fiber couplers and connectors

UNIT3. LED LIGHT SOURCE :
Light emitting diode : recombination processes, the spectrum of recombination radiation, LED characteristics, internal quantum efficiency, external quantum efficiency, LED structure, lens coupling to fiber, behavior at high frequencies.

UNIT4. LASER LIGHT SOURCE :
Basic principles of laser action in semi -conductors, optical gain, lasing threshold, laser structures and characteristics, laser to fiber coupling, comparison with LED source.

UNIT5 . AVALANCHE AND PIN PHOTODETECTORS:
Principles of optical detection, quantum efficiency, responsivity, general principles of PIN photodetector, intrinsic absorption, materials and designs for PIN photodiodes, impulse and frequency response of PIN photodiodes, noise in PIN Photodiodes, multiplication process, APD Design, APD bandwidth, APD noise.

TEXT BOOK:
Optical Fiber Communications: John M Senior; PHI.

REFERENCE BOOKS :
1. Optical Communication Systems : John Gowar; PHI.
2. Optical Fiber Communications : Gerd Keiser; TMH
3. Optical fiber Communication : Selvarajan, Kar, Srinivas; TMH.

NOTE: Eight questions are to be set at least one question from each unit. Students have to attempt five question in all.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-406 : MOBILE COMMUNICATION

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1 MOBILE RADIO SYSTEM:
A reference model, Frequencies for radio transnussion, Signals, Antennas, Signal Propagation, Multiplexing. Modulation

UNIT 2 CHARACTERISTICS OF RADIO WAVES:
Multipath Characteristics of radio waves signal fading, time dispersion, Doppler spread, coherence time, LCR. fading statistics. Diversty techniques

UNIT 3 MOBILE RADIO PROPAGATION:
Mechanism, free space path loss, long distance path loss model, Okumara model, Hata model, PCS model, wideband PCS, Microcell model, Indoor propagation model, Jake's channel model.

UNIT 4 WIRELESS SYSTEMS:
Standards – GSM, signaling & call control, mobility management, location racking wireless data services IS-95, GPRS.

UNIT 5 WIRELESS DATA NETWORKING:
IEEE Standards, Models Different layers, wireless LAN, Hypes LAN, Blue tooth. Performance analysis of link & transport layer protocols over wireless channels.

UNIT 6 MOBILE NETWORK LAYER:
Mobile IP: Goals, assumptions & requirements, IP packet delivery, Agent discovery, Registration, tunneling and en capsulation, optimization, Reverse tunneling, IP-V6, Mobile ad-hoc networks.

UNIT 7 MOBILE TRANSPORT LAYS:
Tradition TCP, Classical TCP improvement, TCP over 2.5G/3G wireless networks. Performance enhancing proxies.

TEXT BOOKS:
Mobile Communication: II nd edition Jochen Schiller Pearson Education

REFERENCE BOOKS:

1. Mobile Cellular Telecommunications: 2nd Edition: William, C Y Lee Mc Graw Hill
2. Wireless and Digital Communication: Dr. Kamilo Feher (PHI)
3. T.S. Rappaport, "Wireless Communication, Principles & Practice", PHI 2001.

Note: Eight questions are to be set – at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-408 : DSP PROCESSORS

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

1. SDP 56002: Architecture, CPU, ALU, Program Controller, Address Generation Unit, Addressing Modes, Interrupt, Priority register.

2. DSP 56002 Instruction Set: Instruction Formats Parallel move operating parallel move types, instructions set, move arithmetic logic, bit manipulation, loop, programmed control instructions.

3. Applications: Designing and implementing FIR, IIR filters, implementing Fast Fourier. Transforms with DSP 56002.

4. TMS - 320 Architecture, and Instruction Set, Addressing, Interrupt Structure, Programming.

TEXT BOOK:

1. Mohammed EL. Sharkawy: Digital Signal Processor Applications with Motorola's DSP 56002. PTR.
2. Venkat Ramani, “Digital Signal Processor :Theory, Programming & Applications”, TMH

Note: Eight questions are to be set – at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-410 : TELECOMMUNICATION SWITCHING CIRCUITS

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

1. **EVOLUTION OF SWITCHING SYSTEM:**

   What is Switching, Types of Switching, Block Diagram of Telecommunication Network, Switching System Fundamentals, Classification of Switching System, Elements of a Switching System, Basic Function of Switching System, Basic Telephone Communication, Function of a Manual Switching System, Magneto or Local Battery Switchboard, Common Battery Switchboard, Limitations of Manual Switching System, Introduction to strowger switching system.

2. **CROSSBAR SWITCHING SYSTEM:**

   Introduction, Principle of Common Control, Touch Tone Dial Telephone, Crossbar Switch Mechanism, Principle of Crossbar Switching, Crossbar Switch Configurations, Organisation of a Crossbar Telephone Switch, A General Trunking, Electronic Switching, Classification Crosspoint Technology

3. **SPACE DIVISION SWITCHING:**

   Stored Program control, Centralised SPC, Distributed SPC, Software Architechture, Application software, Enhanced Services, Two Stage Networks, n-Stage Networks.

4. **TIME DIVISION SWITCHING:**

   Introduction, Analog Time Division Switching, Digital Time Division Switching, A Digital Memory Switch, Time Stages in General, Two-Dimensional Switching, Multiple Stage Time and Space Switching

5. **PACKET SWITCHING:**
   Statistical Multiplexing, Local area & wide area networks, Large Scale Networks, Broadband Networks

6. **TELETRAFFIC ENGINEERING:**

   Introduction, Network Traffic Load, CCITT Recommended Busy Hours, Traffic Terminology, The Unit of Traffic, Congestion, Grade of Service, Blocking Probability, Traffic Measurements, Modelling Switching System, Markov processes representing traffic. Calculation of blocking probability, stationary probability measures for Ergodic Markov processes. Combinatorial interpretation, calculation of blocking probability.

7. **CONTROL OF SWITCHING SYSTEMS:**
   Call Processing functions, common control, Reliability, Availability & Security.

8. **SIGNALLING:**
   Customer Line Signalling, Audio frequency junctions & trunk circuits, FDM carrier Systems, PCM signalling, Inter – register signalling, Common channnel Signalling Principles.

Text Books:

1. Thiagarajan Viswanathan, “Telecommunication Switching Systems and Networks”, PHI
2. Syed Riffat Ali, “Digital switching Systems, system reliability and analysis”, Tata MC Graw, 2002.

Reference Books:

1. Keshav S, “An Engineering Approach to Computer Network Networking”, Addison Wesley, 1998.
2. Martin, “Telecommunication & Computer 3e”, PHI

Note: Eight questions are to be set – at least one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-412 : DIGITAL IMAGE PROCESSING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

1. **Introduction:** Fundamental steps in Digital Image Processing, Components of an Image Processing system, Digital Image Fundamentals: Elements of Visual Perception, Light and the electromagnetic spectrum, Image sensing and Acquisition, simple image formation model.

2. **Image sampling and Quantization:** concept of sampling & quantization, Representation of digital images, spatial and Gray-level resolution, Relationships between pixels-neighbors of pixel, Adjacency, connectivity, regions, and boundaries, distance measures, Image operations on a pixel basis.

3. **Image enhancement in Spatial domain:** some basic Gray Level Transformations, Image negatives, log transformations, Power-Law transformations, piecewise –Linear Transformation functions; Histogram Processing, Enhancement using arithmetic/logic operations, Basics of spatial filtering.

4. **Image Enhancement in frequency domain:** Introduction to Fourier Transform and frequency domain, Two dimensional DFT and its inverse, Filtering in the frequency domain, correspondence between filtering in the spatial and frequency domains; Smoothing frequency domain filters: Ideal lowpass filters, butterworth lowpass filters, Gaussian lowpass filters; sharpening frequency domain filters(Ideal, butterworth & Gaussian highpass filters) Homomorphic filtering, Implementation: properties of 2-D Fourier Transform, Computation of inverse Fourier Treansform using forward Transform algorithm, Fast Fourier Transform.

5. **Image Restoration:** A model of the image degradation/ restoration process, Noise models: Spatial and frequency properties of noise, Periodic noise, Estimation of noise parameters, Restoration in the presence of noise only spatial filtering: Mean Filters, Order statistics Filters, Adaptive filters; Periodic noise reduction by frequency domain filtering, Estimating the Degradation Function, Inverse Filtering. Minimum Mean Square Error (Wiener) filtering

6. **Image Compression:** Fundamentals, Image Compression Models: The source encoder and decoder, the channel encoder and decoder, elements of information theory: Measuring information, The information channel, Fundamental coding theorems; error free compression, lossy compression.

7. **Image Segmentation:** Detection of Discontinuities: Point detection, Line Detection, Edge detection; Edge Linking and Boundary detection, Thresholding: Role of Illumination, basic global thresholding, basic adaptive thresholding, Regional based segmentation: Basic Formulation, Region growing, region splitting and merging; use of motion in segmentation: Spatial Techniques, Frequency Domain Techniques

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Text Books:

1. Rafael C. Gonzalez and Richard E. Woods, “Digital Image Processing”, Pearson
2. Anil K Jain, “Fundamentals of Digital Image Processing”, PHI Edition 1997.

Reference Books:

1. Keenneth R Castleman, " Digital Image Processing”, Pearson
2. Chanda & Majumder, “Digital Image Processing & Analysis”, PHI

NOTE: 1 In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-414 : RADAR AND SONAR ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT 1. INTRODUCTION TO RADAR:
Radar Block Diagram & operation, Radar Frequencies, Radar development, Application of Radar.

UNIT 2. RADAR EQUATION:
Simple form of Radar Equation, Prediction of Range performance, Minimum detectable signal, Receiver noise, Signal to Noise ratio, Transmitter Power, Pulse repetition frequency & range ambiguities, System losses, Propagation effects.

UNIT 3. CW & FREQUENCY MODULATED RADAR:
The Doppler effect, CW Radar, Frequency-modulated CW Radar, Multiple Frequency CW Radar.

UNIT 4. MTI & PULSE DOPPLER RADAR:
Introduction, Delay Line Cancellors, Multiple or staggered, Pulse repetition frequencies, range-Gated Doppler Filters, Digital Signal Processing, Other MTI delay line, Limitation of MTI performance, Noncoherent MTI, Pulse Doppler Radar, MTI from a moving platform.

UNIT 5. TRACKING RADAR:
Tracking with Radar, Sequential Lobbing, Conical Scan, Monopulse Tracking Radar, Tracking in range, Acquisition.

UNIT 6. RECEIVERS, DISPLAYS & DUPLEXERS:
Radar Receivers, Noise Figure, Mixer, Low-noise Front ends, Displays, Duplexer, Receiver protectors.

UNIT 7. INTRODUCTION TO SONAR

TEXT BOOK:
1. Introduction to Radar Systems: Merrill I. Skolnik, ; MGH

REFERENCE BOOK:
1. Electronic Communication Systems : Kennedy; TMH

NOTE: 8 questions are to be set –at least one from each unit. Students have to attempt any five Questions.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-416 : RELIABILITY ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

1. **Introduction:** Definition for Reliability, Need for reliability engineering, Causes of failures, catastrophic failures and degradation failures. Characteristic types of failures, useful life of components, Exponential case of chance failures, Reliability measures, Derivation for exponential distribution function, other kinds pf distributions, Binomial, Poisson uniform, Rayleigh, Weibull, Gamma distributions, Markov chains, failures data analysis.

2. **Reliability in Systems**: Reliability Block Diagrams, series systems, parallel systems, K-out of - M systems, Open and short circuit failures, standby systems. Reliability Analysis of Non-series Parallel system, Boolean Algebra Method, Cut-set approach, delta star method, logical signal relation method, Bayes Theorem Method

3. **Reliability Prediction:** Objective of reliability Prediction, Classification, information sources for failure rate data, prediction methodologies, general requirement, role and limitations of reliability prediction.

4. **Reliability Allocation:** Subsystems reliability improvement, Apportionment for new units, criticality.

5. **Redundancy Techniques for reliability**: Forms of maintenance, measures of maintainability and availability, maintainability function, availability function, two unit parallel system with repair, Markov model for two unit systems, preventive maintenance, provisioning of spares.

6. **Reliability Testing**: Kinds of testing, component reliability measurements parametric methods, confidence limits, accelerate testing, equipment acceptance testing.

7. **Economics of Reliability Engineering**: Reliability cost, effect of reliability on cost. Reliability achievement cost models, reliability utility cost models, replacement policies.

8. **Integrated performance measures for communication systems**: Integration of reliability and capacity, Delay related reliability.

Text Books:
1. KK Aggarwal, “Reliability Engineering”, Kluwer Academic Netherlands.
2. B Singh, “Quality Control and Reliability Analysis”, Khanna Publishers.
Reference Books
1. KB Mishra: Reliability Prediction & Analysis: A Methodology oriented treatment ,Elseveir,Netherlands

2. Ebeling, “Introduction to Reliability & Maintainability”, TMH

NOTE: 1 In the semester exam., the examiner will set 8 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular phone etc. will not be allowed.
3. The scheme of awarding the grades to a student in the course will be supplied by the University to the examiner of answer books.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-418 :TV ENGINEERING

L	P	Credits
3	0	4

Class Work	: 50 Marks
Exam	: 100 Marks
Total	: 150 Marks
Duration of Exam	: 3 Hrs

UNIT1 ELEMENTS OF A TELEVISION SYSTEM :
Picture transmission, sound transmission, picture reception, sound reception synchronization, receiver controls, color television.

Analysis and Synthesis of Television Pictures: Gross structure, image continuity, no. of scanning lines, flicker, fine structure, tonal gradation.

UNIT2. COMPOSITE VIDEO SIGNAL :
Video signal dimensions, horizontal sync details, vertical sync details, scanning sequence details, functions of vertical pulse train, sync details of 525 line system.

UNIT3. SIGNAL TRANSMISSION AND CHANNEL BANDWIDTH :
Amplitude Modulation, channel bandwidth, vestigial side band transmission, Transmission efficiency, complete channel bandwidth, reception of vestigial side band signals, frequency modulation, FM channel bandwidth, channel bandwidth for color transmission, allocation of frequency bands for television signal transmission, television standards.

UNIT4. THE PICTURE TUBE :
Monochrome picture tube, Beam deflection, screen phosphor, face plate, picture tube characteristics, picture tube circuit controls. Television Camera Tubes: Basic principal, Image orthicon, Videocon.

UNIT5. BASIC TELEVISION BROADCASTING:
Television transmitter, positive & negative modulation.
Television Receiver: Receiver sections, vestigial side band correction, choice of intermediate frequencies, picture tube circuitry & controls, sound signal separation, sound section, Sync processing & AFC circuit, vertical Deflection circuit, Horizontal deflection circuit.
Television Signal propagation & Antennas: Television Transmission antennas , television receiver antennas, color television antennas.

UNIT6. ESSENTIALS OF COLOR TELEVISION:
Compatibility, natural light, color perception, three color television camera, the luminance signal, values of Luminance & color difference signals on Colors, color television display tubes (Delta gun, PIL, Trinitron).

UNIT7. COLOR SIGNAL TRANSMISSION AND RECEPTION :
Color signal transmission, bandwidth for color signal transmission.

UNIT8. TELEVISION APPLICATIONS:
Cable television, CCTV, picture phone & fascimile, television via satellite, Remote Control (Electronic control system), Introduction to Digital TV Technology and their merits , HDTV.

TEXT BOOK:
Monochrome and Color Television : R.R.Gulati ; New Age.

REFERENCE BOOK :
TV and Video Engineering : Dhake ; TMH.

NOTE: Eight questions are to be set – one from each unit. Students have to attempt five questions.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-442 : SEMINAR

L	P	Credits		
-	1	2	Class Work	: 50 Marks
			Total	: 50 Marks

The objectives of the course remains

- To learn how to carryout literature search
- To learn the art of technical report writing
- To learn the art of verbal communication with the help of modern presentation techniques

A student will select a topic in emerging areas of Engineering & Technology and will carry out the task under the observation of a teacher assigned by the department.

He/ She will give a seminar talk on the same before a committee constituted by the chairperson the department. The committee should comprise of three faculty members from different specializations. The teacher associated in the committee will be assigned 1 hours teaching load per week.

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However, guiding students' seminar will not be considered towards teaching load.

The format of the cover page and the organization of the body of the seminar report for all the undergraduate programs will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-422 : SATELITE COMMUNICATION LAB

L	P	Credits
-	2	2

Class Work : 25 Marks
Exam. : 25 Marks
Total : 50 Marks
Duration of Exam : 3 hrs.

LIST OF PRACTICALS / DEMONSTRATIONS:

1. To set up a active and passive satellite communication link and study their difference.
2. To measure the base-band analog (voice) signal parameters in the satellite link.
3. To measure C/N ratio.
4. To transmit and receive the function generator waveforms through a Sat.Com. link.
5. To measure the digital baseband signal parameters in Sat.Com. link.
6. To send telecommand and receive the telemetry data.
7. To set a PC to PC Sat. Com. Link using RS-232 ports.
8. To measure the propagation delay of signal in a Sat. Com. Link.
9. To measure fading of a received signal.
10. To measure the parameters in an analog FM/FDM TV Sat.Com. link.
11. To measure the S/N ratio.
12. To calculate the figure of merit and FM deviation.

Note:

1. Total ten experiments are to be performed in the Semester.
2. At least seven experiments should be performed from the above list. Remaining three experiments should be performed as designed & set by the concerned Institution as per the scope of the syllabus

B.TECH. WEEKEND SEMESTER- VIII
ECE(W)-425 : PROJECT

L	P	Credits
-	1	8

Class Work : 50 Marks
Exam. : 100 Marks
Total : 150 Marks
Duration of Exam : 3 hrs.

The project started in VII Semester will be completed in VIII Semester and will be evaluated through a panel of examiners consisting of the following:

Chairperson of Department	: Chairperson
Project coordinator	: Member
External expert	: To be appointed by the University

The student will be required to submit two copies of his/her project report to the department for record (one copy each for the department and participating teacher).

Project coordinator will be assigned the project load of, maximum of 1 hrs. per week including his own guiding load of one hr. However, the guiding teacher will be assigned maximum of one period of teaching load irrespective of number of students/groups under him/her.

The format of the cover page and the organization of the body of the report for all the B.Tech. will be finalized and circulated by the Dean, Faculty of Engineering and Technology.

B.TECH. WEEKEND SEMESTER- VIII
GPEC(W)-402 : GENERAL FITNESS FOR THE PROFESSION

Credits 4 | Exam : 100 Marks

The purpose of this course is to inculcate a sense of professionalism in a student along with personality development in terms of quality such as receiving, responding, temperament, attitude and outlook. The student efforts will be evaluated on the basis of his/ her performance / achievements in different walks of life.

The evaluation will be made by the committee of examiners constituted as under:

1.	Dean, Faculty of Engineering & Technology	Chairperson
2.	Chairperson of the department	Member
3.	External expert	Appointed by the university

A. The student will present a written report before the committee with following in view:

The student will present before the committee his/her achievements during the current academic session in the Form of a written report highlighting following:

I.	Academic Performance	--------
II.	Extra Curricular Activities	**(8 Marks)**
III	Technical Activities	**(8 Marks)**
IV	Industrial, Educational tour	**(8 Marks)**
V	Sports/games	**(8 Marks)**
VI	Community Service, Hostel Activities	**(8 Marks)**

NOTE: Report submitted by the students should be typed on both sides of the paper.

B. A student will support his/her achievement and verbal & communicative skill through presentation before the examiners. **(40 Marks)**

C. Faculty Counselor Assignment **(20 Marks)**

It will be the duty of the student to get evaluated by respective faculty counselor and to submit the counselor assessment marks in a sealed envelop to the committee.

A counselor will assess the student which reflects his/her learning graph including followings:

1. Discipline throughout the year
2. Sincerity towards study
3. How quickly the student assimilates professional value system etc.