8.3.a B.E. 1st year ANNUAL PATTERN – (Common to All Branches, Except in Architecture)

Year	Sub.Code	Subject Name	L	T	P	D	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
1	1-1	Applied Mathematics-I	3	1			4	100	80	20	0			3
1	1-2	Applied Mathematics-II	3	1			4	100	80	20	0			3
1	1-3	Applied Physics	2	1	4		7	100	80	20	50	25	25	3
1	1-4	Applied Chemistry	2	1	4		7	100	80	20	50	25	25	3
1	1-5	English	1	1			2	100	80	20	0			3
1	1-6	Social Sciences	1	1			2	100	80	20	0			3
1	1-7	Engineering Mechanics	2	1	1.5		4.5	100	80	20	50	25	25	3
1	1-8	Engineering Drawing	1	0		3	4	100	80	20	50	25	25	4
1	1-9	Electrical Engineering	2	1	1.5		4.5	100	80	20	50	25	25	3
1	1-10	Workshop	0	0	4		4				100	50	50	
		Total	**17**	**8**	**15**	**3**	**43**	**900**			**350**			**Total Max Marks 1250**

8.3.d SEMESTER PATTERN – BRANCH : ELECTRONICS AND TELECOMMUNICATION ENGINEERING , Direction No. 4 of 2001

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
3	3-ET-1	Mathematics-III	3	1	0	4	100	80	20				3 Period
3	3-ET-2	Electronic Devices And Circuits	4	1	2	7	100	80	20	50	25	25	3 Period
3	3-ET-3	Electronic Measurement	4	1	2	7	100	80	20	50	25	25	3 Period
3	3-ET-4	Network Theory	4	1	0	5	100	80	20				3 Period
3	3-ET-5	C And Data Structure	4	1	2	7	100	80	20	50	25	25	3 Period
		Total	**19**	**5**	**6**	**30**	**500**			**150**			**Total 650**

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
4	4-ET-1	Mathematics-IV	3	1	0	4	100	80	20				3 Period
4	4-ET-2	Digital Circuits	4	1	2	7	100	80	20	50	25	25	3 Period
4	4-ET-3	Electronic Engg.Materials &	4	1	0	5	100	80	20				3 Period

		Compouent											
4	4-ET-4	Electromagnetic Fields	4	1	0	5	100	80	20				3 Period
4	4-ET-5	Basic Electrical Machines	4	1	2	7	100	80	20	50	25	25	3 Period
		Total	**19**	**5**	**4**	**28**	**500**			**100**			**Total 600**

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
5	5-ET-1	Engineering Eco. & Indl. Management	3	1	0	4	100	80	20				3 Period
5	5-ET-2	Linear Electronic Circuits	4	1	2	7	100	80	20	50	25	25	3 Period
5	5-ET-3	Signal And Systems	4	1	0	5	100	80	20				3 Period
5	5-ET-4	Power Electronics	4	1	2	7	100	80	20	50	25	25	3 Period
5	5-ET-5	Microprocessor Interfacing	4	1	2	7	100	80	20	50	25	25	3 Period
		Total	**19**	**5**	**6**	**30**	**500**			**150**			**Total 650**

8.3.d SEMESTER PATTERN – BRANCH : ELECTRONICS AND TELECOMMUNICATION ENGINEERING , Direction No. 4 of 2001

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
6	6-ET-1	Fields And Radiating Systems	4	1	0	5	100	80	20				3 Period
6	6-ET-2	Control System Engineering	4	1	2	7	100	80	20	50	25	25	3 Period
6	6-ET-3	Line Communication	4	1	0	5	100	80	20				3 Period
6	6-ET-4	Communication Electronics	4	1	2	7	100	80	20	50	25	25	3 Period
6	6-ET-5	Computer Organization	4	1	0	5	100	80	20				3 Period
6	6-ET-6	Electronic Workshop Practice	0	0	2	2				50	25	25	
		Total	**20**	**5**	**6**	**31**	**500**			**150**			**Total 650**

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
7	7-ET-1	Television Engineering	4	1	2	7	100	80	20	50	25	25	3 Period
7	7-ET-2	Advanced Microprocessor & Peripherals	4	1	2	7	100	80	20	50	25	25	3 Period
7	7-ET-3	Digital Signal Processing	4	1	2	7	100	80	20	50	25	25	3 Period
7	7-ET-4	Digital Communication	4	1	0	5	100	80	20				3 Period
7	7-ET-5	Elective-I	4	1	0	5	100	80	20				3 Period
7	7-ET-6	Project Seminar	0	0	3	3				50		50	
		Total	**20**	**5**	**9**	**34**	**500**			**200**			**Total 700**

Sem	Sub.Code	Subject Name	L	T	P	Period .per week	Max marks theory	Paper	College Asses.	Max marks pract	Pract	College Asses.	Paper Duration
8	8-ET-1	Electronic System Design	4	1	2	7	100	80	20	50	25	25	3 Period
8	8-ET-2	UHF And Microwave	4	1	2	7	100	80	20	50	25	25	3 Period
8	8-ET-3	Mobile Communication	4	1	0	5	100	80	20				3 Period
8	8-ET-4	Optical Communication	4	1	0	5	100	80	20				3 Period
8	8-ET-5	Elective-II	4	1	0	5	100	80	20				3 Period
8	8-ET-6	Project	0	0	6	6				150	75	75	
		Total	**20**	**5**	**10**	**35**	**500**			**250**			**Total 750**

ELECTIVE-I

1] Digital System Design
2] Radar Engineering
3] Satellite Communications

ELECTIVE-II

1] Digital Image Processing
2] Computer Communication & Networks
3] Fuzzy logic and neural network

3-ET-1

UNIT-I:

Laplace Transforms: Laplace transforms and their simple properties, simple applications for Laplace transform to solve ordinary differential equations including simultaneous equations, solution of one-dimensional partial differential equations by transforms method.

UNIT-II:

Complex Variables: Analytic function, Cauchy-Riemann conditions, conjugate functions, singularities, Cauchy's integral theorem and integral formula (statement only), Taylor's and Laurent's theorem (statement only), Residue theorem, contour integration.

UNIT-III:

Calculus of Variations: Maxima and Minima of functions, variation and its properties Euler's equation, functional dependent on first and second order derivatives, simple applications.

UNIT-IV:

Fourier series and Signal Spectra: Introduction, the Fourier theorem, Evaluation of Fourier coefficients, consideration of symmetry, (odd, even, and rotational), exponential form: Fourier series, Fourier integral theorem, Fourier transform and continuous spectra.

UNIT-V:

Partial Differential Equation: Partial Differential Equation of first order first degree i.e. Langrage's form, Linear, homogeneous p.d.e. of nth order with constant coefficient, method of separation of variables. Application to transmission lines.

UNIT-VI:

Matrices: Inverse of matrix by adjoint method and its use in solving simultaneous equations, rank of a matrix , consistency of system of equation, Inverse of matrix by partitioning method.Linear dependence, Linear and orthogonal transformations. Characteristics equations, eigen values and eigen vectors. Reduction to diagonal form, Cayley- Hamilton Theorem (without proof) statement and verification, Sylvester's theorem, Association of matrices with linear differential equation of second order with constant coefficient. Determination of largest eigen value and eigen vector by iteration method.

Text Books:

1. Advance Engineering Mathematics: Kreyszing.
2. Higher Engineering Mathematics: B.S. Grewal
3. Linear Network Theory by Kelkar, Pandit (for Unit No. 4)

Reference Books :

1. Mathematics for Engineers: Chandrika Prasad.
2. Advanced Mathematics for Engineers: Chandrika Prasad.
3. Applied Mathematics for Engineers: L.A. Pipes and Harville.
4. A text Book of Applied Mathematics: P.N. and J.N. Wartikar.

B.E. III Semester Electronics & Telecommunication Engineering
Electronics Devices and Circuits

3-ET-2

UNIT-I:

Semiconductor Diodes and Power Supplies: Intrinsic and extrinsic semiconductors, P-N junction diode, open circuited junction, Forward and reverse bias, V-I characteristics, dynamic resistance, temperature dependence, junction capacitance. Avalanche and zener breakdown, Schottkey diode, photodiode, LEDs, LCD, Varactor diode, Tunnel diode. Power supplies, Halfwave & Fullwave Rectifiers, Voltage doublers, filters, ripple-factor. Zener & Emitter follower type and series regulators.

UNIT-II:

Junction Transistors: Theory of operation, static characteristics, Break down voltages, current voltage power limitations, Biasing of BJT different biasing arrangements, stability factor. Thermal runaway, Power transistors.

UNIT-III:

BJT Analysis: Small signal analysis CE, CB, CC amplifiers and comparison. High frequency analysis calculation of frequency response, gain bandwidth product.

UNIT-IV:

Power Amplifiers: Classification A, B, AB, C classes efficiency, Push Pull configuration (A, B, AB) complimentrary symmetry, second harmonic and cross over distortion.

UNIT-V:

Positive and Negative Feedback Amplifiers: Feedback amplifiers, classification, Practical circuits applications, and advantages. Oscillators, Stability, Barkhausen Kriterion RC, LC & Crystal Oscillators.

UNIT-VI:

FET And Its Analysis: Field effect transistor & MOSFET, Principal of Operation & characteristic, biasing arrangement, small signal analysis of CG, CD, CS High frequency analysis.

Text Books:

1. Milman and Halkias: Integrated Electronics, McGraw Hill.
2. Milman and Halkias: Electron Devices and Circuits, McGraw Hill.

Reference books:

1. Schilling & Beloove: Electronics circuits-Discrete & integrated (McGraw Hill)
2. Bapat: Theory & problems in circuit analysis (McGraw Hill)

3. Carr: Electronic Devices (Tata Mc-Graw Hill)

Practical List:

1. Diode Characteristics.
2. CE amplifier characteristics
3. FET & MOSFET characteristics.
4. Half wave, fullwave rectifiers with & without filters.
5. EF type regulator.
6. RC phase shift oscillator.
7. Push-pull amplifier.
8. Voltage series feedback amplifier frequency response.
9. Voltage doubler.
10. Zener regulator

B.E. III Semester Electronics & Telecommunication Engineering
Electronics Measurements

3-ET-3

UNIT-I:

Statistical analysis of measurement of errors, accuracy, Precision, types of errors, Fundamental and Derived units, conversion of units. Classification of standards: for mass, length, time, volume, frequency, temperature light intensity, electrical properties.

UNIT-II:

PMMC galvanometer, dc voltmeter, ammeter, multimeter, Watt-hour meter, three phase wattmeter, power factor meter instrument transformers. Measurement of low, medium & high resistance.

UNIT-III:

Bridges: Wheat stone, Kelvin, Max-well, Hay, Schering, Wienbridge. Potentiometers, Measurement of Inductance, Capacitance using AC Bridge.

UNIT-IV:

Amplified dc meters, Ac voltmeter using rectifiers, True/RMS voltmeter, Electronics Multimeter, Digital Voltmeter, Component measuring instruments, Q-meter, RF power and voltage measurement.

UNIT-V:

Oscilloscopes: Block Diagram, CRT deflection system, delay line multiple trace, triggering, delayed sweep, digital storage oscilloscope.

UNIT-VI:

Frequency, Time and Power measurement signal analysis.

(Practical based on above syllabus)

Text Books:

1. Electronics Instrumentation and Measurement Techniques by Copper and Helfrick, PHI Publications.

Reference Books:

1. Electronics Instrumentation by Terman & Petil.
2. Electronics Instrumentation by Kalsi (TMH Pub.)
3. Electronics Measurement and Instrumentation by Oliver (TMH Pub.)
4. Measurement Analysis by Earnest Frank.
5. Electric Measurement and Measuring Instruments by Drydate and Jolley.
6. Electric and Electronic Measurement and Measuring Instruments by Rama Bhadra (Khanna Pub.)

B.E. III Semester Electronics & Telecommunication Engineering
Network Theory

3-ET-4

UNIT-I:

Nodal and Mesh-Basis equilibrium equation, matrix approach for complicated Network containing voltage current-sources and reactances, source transformations, duality, Mesh basis equation for coupled circuits.

UNIT-II:

Network Theorems: Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power transfer, compensation, Tellggen's theorem as applied to A.C. circuits.

UNIT-III:

Trigonometric and exponential Fourier series, discrete spectra and symmetry of waveforms, steady state response of a Network to non-sinusoidal periodic inputs. Power factor, erective values, Fourier transforms and continuous spectra, three phase unbalance circuit and power calculations.

UNIT-IV:

Laplace transforms and properties, partial fractions singularity functions, waveforms synthesis. Analysis of RC, RL and RLC networks with and without initial conditions with laplace transforms, Evaluation of initial conditions.

UNIT-V:

Transient behaviour, concept of complex frequency, driving points and transfers functions, poles and zeros of Immittance functions their properties, sinusoidal response from pole-zero locations, convolution theorem and integral solutions.

UNIT-VI:

Two port Network parameters and inter-connections, Behaviour of series and parallel resonant circuits. Introductions to band pass, Low Pass, high pass and band reject filters.

Text Books:

1. Network Analysis: Van Velkenburg
2. Linear Network Theory: Kelkar & Pandit

Reference Books:

1. Network and System: D.P. Roychoudhary.
2. Network Analysis: G.K. Mittal.
3. Electrical Circuits: Del. Tore, Prantice Hall.
4. Modern Network Analysis by Reza and Seely, McGraw Hill.

B.E. III Semester Electronics & Telecommunication Engineering
C & Data Structure

3-ET-5

UNIT-I:

Structure of C programs-Data Types storage classes, scope of variables, expressions and operators.

UNIT-II:

Program Control Statements – for, if, while. Switch concept of function and recursion.

UNIT-III:

I/O through printf, scanf functions, files I/O Open., Close, read & write.

UNIT-IV:

Arrays searching (Linear & Binary) Sorting (Bubble. Selection sort).

UNIT-V:

Pointers and Structures. Singly linked list Insertion, deletion, updation.

UNIT-VI:

Study of following numerical methods with reference to algorithm development and error analysis.

- Newton Raphson Method
- Gauss Seidal Method
- Rung Kutta Method (Second Order)

(Practical Based on above syllabus.)

Text Books:

1. 'C' programming language ANSI C- Kernighan and Rietohe.
2. A textbook on Programming Languages C and C++ - Kakde and Deshpande.
3. Introduction to numerical Methods – S.S. Shastri Prentice Hall India.

Reference Books:

1. Venugopal: Pascal & C Programming (Tata McGraw Hill).
2. Dale, Lilly: Pascal plus Data Structure (Tata McGraw Hill).
3. Gottfried (Schaum series): Computer programming with 'C'- McGraw Hill.
4. Computer Algorithms: Rajaraman.

B.E. IV Semester Electronics & Telecommunication Engineering
Applied Mathematics-IV

4-ET-1

UNIT-I:

Numerical Methods: Error Analysis, Solution of algebraic and transcendental equations, method of false position, Newton-Raphson method and their convergence.System of Linear equations, Gauss elimination method, Gauss seidel method, Crouts method. Numerical solution of ordinary differential equation by Taylor's series method, Rung Kutta methods, Euler modified method, Milne's predictor corrector method.

UNIT-II:

The Z-Transform: Z-Transform, inverse Z-Transform, Relationship of the Fourier transform to Z-transform, Properties of Z-transform, Convolution of two sequences, Poles and Zeros, The inverse Z-transform by power series expansion, The inverse Z-transform form by partial fraction expansion, The one sided Z-transform: Definition and properties, Solution of Difference equations.

UNIT-III:

Random Variable and Probability Distribution: Random variables: Discrete and continuous, probability density function, probability distribution function for discrete and continuous random variable joint distributions.

UNIT-IV:

Mathematical Expectations: Definition of mathematical expectation, function of random variables, the variance and standard deviations, moment generating function other measures of central tendency and dispersion, Skewness and Kurtosis.

UNIT-V:

Probability Distributions: Bernoulli Distribution, Poisson distribution, Relation between Binomial and Poisson distribution. Normal distribution, Relation between Binomial and Normal distribution. The central limit theorem, Exponential distribution.

UNIT-VI:

Special Functions and Series Solution: Series solution of differential equation by : Frobanius method, Bessel's functions, Legendre's polynomials, Recurrence relations, Rodrigu's formula generating functions, orthogonal properties $j_n(x)$ and $P_n(x)$.

Text Books:

1. Introductory methods of numerical analysis - S.S. Shastri.
2. Higher Engineering mathematics- B.S. Grewal.
3. Theory and Problems of Probability and statistics- R. Soiegal (McGraw Hill) Schaum Series.
4. Digital Signal Processing Principle, Algorithms and Applications- John Proakis, D.G. Manolakis, 2nd Edition.

B.E. IV Semester Electronics & Telecommunication Engineering
Digital Circuits

4-ET-2

UNIT-I:

Analog V/s. Digital Systems, Transistor as a switch, Boolean Algebra, Boolean identities, Logical Problems, Binary, Gray, Octal, Hex & ASCII codes, Gates and their truth tables, D Morgan's Laws, Sum of products & Product of Sums.

Logical families: TTL, ECL, CMOS etc., Fan-in, Fan-out, propagation delay properties.

UNIT-II:

Combinational logic - concepts, SSI, MSI & VLSI Circuits. Classifications Standard TTL, CMOS characteristics, Decoders, Encoders. Multiplexers, Demultiplexers, code converters, characteristics of display devices, standard configuration of gates as SSI/MSI/LSI circuits.

UNIT-III:

Karnaugh map, simplification of sum of products and products of sum, solution to problems using K-maps; conversion of Decoders/ MUX to one another use of MUX as function generator.

UNIT-IV:

Introduction to Flip Flop, Latches, Concept of clock, Memories conversation with Flip Flop as basic cell, RAM, ROM, EPROM & EEPROM-an overview, Master slave combination and conversion of one type to another type Flip Flops.

UNIT-V:

Excitation tables & introduction to sequential circuits counters synchronous / asynchronous. Different modulo counters with reset / clear facility. Design of counters of arbitrary modulo with K-maps, Lock free counters.

UNIT-VI:

Arithmetic Circuits- Adders, Subtractor (Half & Full). BCD adder / subtractor concept of ALU and its design. Integrated circuits version of multivibrators and their design parameters.

Text Books:

1. Digital Logic and Computer Design- Mano (PHI).
2. Digital Integrated Electronics- Herbert Taub, McGraw Hill.
3. Digital Electronics Principles- Malvino and Leeach, PHT.
4. Modern digital Electronics- R. P. Jain.
5. Introduction to Digital System- Palmer, Tata McGraw Hill.
6. Digital Electronics- Ryan, McGraw Hill.
7. Digital Circuits and Microprocessor- Herbert Taub, McGraw Hill.

B.E. IV Semester Electronics & Telecommunication Engineering
Electronics Engineering Materials & Components

4-ET-3

UNIT-I:

Dielectric, Properties of insulators in static fields, Polarization, dielectric constant dielectric behavior of monatomic & polyatomic gases, Liquids & solids, polar & non-polar dielectrics, Clasius-Mosotti equation, ferroelectric, piezo electric & pyroelectric materials.

UNIT-II:

Dielectric properties of insulators in alternating fields, complex dielectric constant, dipolar relaxation, dielectric loss, loss tangent, dielectric breakdown, fixed and variable capacitors, electrolytic, paper, plastic, ceramic & mica capacitors used in electronics circuits, dielectrics used in cables & transformers.

UNIT-III:

Conductivity of pure meters & alloys temperature coefficient of resistivity, high conductivity materials, high resistivity materials, heating elements, fuses, contact materials, connectors, switches, heat sinks, solders, fixed variable resistors, nonlinear resistors, resistors used in electronics circuits, super conductivity, type I & II materials, high temperature superconductivity, applications of superconductivity.

UNIT-IV:

Spin & orbital magnetic dipole moment of electron, dia, para, ferro, ferry & anti ferromagnetism, soft and hard magnetic materials, ferrites, magnetic cores of conductors, transformers, relays, electric machines & memory elements, magnetic resistors, magnetic tapes.

UNIT-V:

Semiconductors, band gap, electron & hole mobilities purification & doping of semiconductor materials, characteristics of semiconductor devices, diodes, zener & breakdown diodes, tunnel diodes, varactors, transistors (BJT, FET, MOSFET, UJT), Diac, SCR & Triac, Hall effect devices.

UNIT-VI:

Fabrication of linear & digital ICs, LSI, VLSI, CMOS devices, optoelectronics devices, LCD, LED, phototransistors, Optical couplers, detectors, optical fibers, lasers.

Text Books:

1. A course in Electrical Engineering Materials. S.P. Seth & A.V. Gupta : Dhanpatrai & Sons, New Delhi
2. Electronics Components & Materials M.A. Joshi, A.H. Wheeler ECO, Allahabad 211001.

Reference Books:

1. Discrete Electronics Components. F.F. MAZDA, Cambridge Univ, Press, New York.
2. Electronics Engineering Material A.J. Dekker.

B.E. IV Semester Electronics & Telecommunication Engineering
Electromagnetic Fields

4-ET-4

UNIT-I:

Gradient, Divergence & curl of a vector & their physical interpretation, Divergence & Stoke's theorem, their proof & validity for vector fields. Irrotational & solenoidal fields. The uniqueness & Helmholtz theorems.

UNIT-II:

Electrostatic fields, Coulomb's law, Electric field for different charge distributions. Gauss's law & its applications. Electric potential for different charge distributions. Poisson's & Laplace equations.

UNIT-III:

Magnetic fields, Lorentz law, Biot-Savart law, Magnetic field due to different current distributions. Gauss's law & Ampere's law. Magnetic vector potential & magnetic flux. Magnetic vector potential for different current distributions. Lenz's & Faraday's laws, Energy stored in magnetic fields.

UNIT-IV:

Electric scalar potential, solution of Laplace equation in two dimensions using method of separation of variables, displacement current. Maxwell's equations for time varying fields & their physical significance. Boundary conditions of the vector fields.

UNIT-V:

Poynting Vector theorem & its proof, Uniform plane wave, wave equation & its solution in free space, relation between E. & H. vectors, intrinsic impedance, wave equations & their solutions & conducting & dielectric media.

UNIT-VI:

Plane waves, normal & oblique incidence on a perfect conductor & dielectric, reflection & refraction, Snell's law, Brewster angle, polarization, linear, circular & elliptical.

Text Books:

1. Electromagnetic waves & radiating systems: E.C. Jordan & K.G. Balmain.
2. Principals & applications of Electromagnetic fields: Pionsey & Collins.
3. Electromagnetic Fields: Hayt.
4. Massar: 2000 solved Problem in Electromagnetic.

B.E. IV Semester Electronics & Telecommunication Engineering
Basic Electrical Machines

4-ET-5

UNIT-I:

Transformer: Single Phase and three phase-effect of loading, regulation, open circuit and short-circuit tests, efficiency, all day efficiency, parallel operation. Autotransformers.

UNIT-II:

D.C. Generators, series shunt and compound, Commutator, armature EMF, armature reaction and commutation, equivalent circuit, characteristics, parallel operation, Applications.

UNIT-III:

D.C. Motor: Series shunt and compound, Back emf, characteristics, starting, speed control, applications.

UNIT-IV:

Three Phase, Induction Motor: Principal of operation, type torque and slip equivalent circuit. No. Load and blocked rotor test starting speed control and applications.

UNIT-V:

Single Phase Motors: Principle of operation of single-phase induction motor, starting methods, principle of a.c. series motor, Universal motor.

UNIT-VI:

Three phase synchronous Machines: Motor and Generator action synchronous impedance and excitation. Equivalent circuit, voltage regulation, starting of motor, effect of excitation variation in case of motor.

Text Books:

1. Electrical Machinery : Nagarath Kothari (TATA – McGraw Hill)
2. Electric Machinery : Fitzerald, Kingsley.
3. EMEC Devices : Deltord (McGraw Hill).
4. Electrical Machines by Dr. P.K. Mukherjee and S. Chakravarti (Dhanpatrai).

B.E. V Semester Electronics & Telecommunication Engineering
Engineering Economics and Industrial Management

5-ET-1

UNIT-I:

Demand Utility and Indifference curves, Approaches to analysis of demand, Elasticity of demand, Measures of demand elasticity Factors of production. Advertising elasticity, Marginalism.

UNIT-II:

Laws of returns and. costs, Price and output determination under perfect competition, Monopoly, Monopolistic competition, oligopoly, Depreciation and methods for its determination.

UNIT-III:

Functions of central and commercial banks Inflation, Deflation, Stagflation, Direct and Indirect taxes. . Monetary and cycles, new economic policy, Liberalisation, Globalisation, privatisation, market friendly state, fiscal policy of the government, Meaning and phases of business.

UNIT-IV:

Definition , nature and scope of management, Functions of Management-Planning, Organising, Directing, Controlling, Communicating.

UNIT-V:

Meaning of Marketing managements, Concepts of Marketing. Marketing Mix, Administrative and cost plus pricing, Channels off distribution, advertising and sales promotion.

UNIT-VI:

Meaning, nature and scope of financial management Brief outline of profit and loss account, Balance sheet, Budgets and their importance, Ratio analysis, Principles of costing.

Text Books:

1. Modem Economics by H.L. Ahuja.
2. Modem Economic Theory by K.K. Dewett.
3. Monetary Economics by M.L. Seth.
4. Industrial Management by I.K. Chopde, A.M. Sheikh.

Reference Book:

1. Business Organisation and Management by S.A. Sherlekar.
2. Managerial Economics by Joel Dean.
3. Managerial Economics by Pylee.
4. Economics by Samuelson.

B.E. V Semester Electronics & Telecommunication Engineering
Linear Electronic Circuits

5-ET-2

UNIT-I:

Basic operational amplifier circuit: Differential amplifier stages, current source biasing, level shifting techniques, common mode and differential mode gains and impedances of a differential stage.

UNIT-II:

Overload protection circuits, Frequency response and compensation characteristics of ideal and non-ideal operational amplifiers, and error measurement of various parameters.

UNIT-III:

Simple circuits like inverting, non-inverting, buffer amplifiers, summers, integrators and differentiator, log, antilog, multiplier, divider circuits, Differential amplifier configurations, bridge amplifiers, instrumentation amplifier, grounding and shielding problem in instrumentation amplifiers.

UNIT-IV:

Precision rectifiers, RMS to DC conversion; constant current and voltage source sinusoidal oscillators, with frequency and amplitude stabilization, Elementary idea of active filter, Second order: Butterworth chebyshew filter.

UNIT-V:

Non-linear OP-AMP circuits for clipping, Clamping and comparator circuits with nonlinear components, multiplexers and demultip1exers, bistable, monostable astable multivibrator circuits using OP-AMP, Sample/Hold circuits, D/A and conversion circuits, phased Locked loops.

UNIT-VI:

Applications of Linear ICs like LM741 (Industrial OP-AMP IC)-LM55 (Industrial timer IC), LM566, (VCO) LM565 (PLL), LM339 (Comparator), LM1723 (Voltage regulator), Regulator IC series 78xx, 79xx, switch mode power supply.

Text Books:

1. Operational Amplifiers Design and Applications Tobey, Graham, Huelsman McGraw Hill.
2. Operational Amplifiers and Applications: R. Gaikwad.

Reference Books:

1. Linear Integrated circuits Manual I, II, III: National Semiconductor.
2. Linear Applications Handbook National Semiconductors.
3. Dailey: Operational Amplifiers (Tata McGraw Hill).
4. Wait: Introduction to Operational Amp) (McGraw Hill)
5. Franco: Designing with Op-Amps (McGraw Hill)
6. Tobey: Operational Amplifiers**.**

(Practical based on the above syllabus.)

B.E. V Semester Electronics & Telecommunication Engineering
Signals and Systems

5-ET-3

UNIT-I:

Spectral analysis, Fourier series, Fourier transforms, Dirac Delta function, Fourier transform of periodic signals, Spectral density, Auto correlation and Cross Correlation, Transmission of signals through linear systems ideal L.P .E. pre -envelope, band pass signals & systems, phase and group delay.

UNIT-II:

Random process, probability, random variables, process stationarity, mean co- relation covariance functions, time averages and ergodicity, transmission of random process through a linear filter, spectral density, Guassian process, noise, narrow band noise, envelope of sinewave plus narrow band noise.

UNIT-III:

Elementary theory of SSB, DSB & Noise calculation, Noise calculations .in SSBSC, DSB with carrier, square law demodulation, envelope demodulator, Noise in FM reception, Effect of transmitter noise, FM threshold effect.

UNIT-IV:

Bandwidth and rate of pulse transmission pulse spreading & inter£erenc, PSD of digital signals line coding, signalling schemes like on-off, polar and bipolar signalling, Control of PSD by pulse shaping, Nyquist first & second criteria.

UNIT-V:

Digital Carrier Systems: Matched filter detection of binary signals, decision, threshold, error probability, Salient features of ASK, FSK & PSK system DPSK systems including Mary Communication Systems.

UNIT-VI:

Information theory, information measure, Entropy, channel capacity of Discrete & continuous channels, error control coding concepts of hamming distance and hamming codes, Convolution codes, comparison of codes & uncoded systems.

Text Books:

1. Communication Systems: B.P. Lathi.

2. Modern Digital & Analog Communication Systems: B.P.Lathi.

Reference Books:

1. Communication Systems: A.B. Carlson.

B.E. V Semester Electronics & Telecommunication Engineering
Power Electronics

5-ET-4

UNIT-I:

Semiconductor devices used in power electronics: Silicon controlled rectifier (SCR), Asymmetrical .SCR (ASCR), Reverse, conduction thyristor (RCT), Light activated SCR (LASCR), Field controlled thyristor (FCT), TRIAC, Monolithic Darlington (MD), Insulated Gate Bipolar transistor: (IGBT), power MOSFET, GTO, Triggering devices: UJT PUT, SLAC, GOS, SCS, SUS, and SBU. Device treatment should deal with construction characteristics, ratings, application.Thermal equivalent circuit, Heat sink calculation; protection requirements and methods.

UNIT-II*:*

Thyristor as power controller: Phase angle control, Extinction angle control, Symmetrical angle control, time ratio control, Pulse width modulation, Burst-Integral cycle.

Turn on Systems: Requirements: METHODS CIRCUITS, r, re, UJT MSI (Medium Scale Integrated circuits) for single phase line communicated converter single phase converter, single phase inverter, Digital methods, Turn off (commutation) systems Requirements: Methods (Circuits) types A, B, C, D, E, and F.

UNIT-III:

Uncontrolled Rectifiers: Single Phase: Midpoint two Pulse (M-2) bridge two pulse- (B-2 for resistive, inductive and motor loads). 3-phase: midpoint three phase (m-s) midpoint six phase (M-6), Bridge three phase (B-3), Bridge six pulse (B-6) for resistive, inductive and motor load, filter –C input, L input, LC. Analysis of wave form , Fourier.

UNIT IV:

Single phase-/three phase half controlled (one quadrant operation). Single phase, midpoint two pulse, bridge two pulse of resistive, inductive and motor load

Three phase: mid point three phase, mid point six pulse bridge three pulse, bridge six pulse for resistive, inductive, and motor loads.

Full controll (Two quadrant operation): Single phase –mid point two pulse, bridge two pulse, for resistive, inductive and motor loads.

Three phase –mid point three pulse, mid point six pulse, bridge six pulse for resistive, inductive and motor loads. Dual converter for quadrant operation: Single-phase bridge, three-phase bridge, circulating, non-circulating.

UNIT V:

Inverters: Types-series, parallel, bridge, PWM voltage source inverters, current source inverter (CSI), Filters –Types, calculations

Commutations method: Auxiliary, complimentary, transistorised, power controllers, circuits (treatment for inverter should consist of circuits, waveform and analysis).

UNIT VI:

Choppers: Types A, B, C, D, E multiphase, line filter one, two and four quadrant operation of choppers, Commutation methods: Voltage current, load (treatment should consist of circuits, waveform analysis). AC regulators: single phase and three phase manual auto, solid state, servo control, uninterrupted power supply, UPS, switch mode power supply (SMPS).

Text Books:

1. Power electronics :P.C.Sen
2. Thyristorised power controller: Joshi, Dubey, Doradla, Sinha
3. Thyristor and their application: Rammoorthy
4. GEC Manual.

Reference Books:

1. Power electronics :Cyril W. Landet
2. Power electronics :Kjeld Thorborg
3. Power semiconductor devices and applications by Rasid

(Practical based on the above syllabus.)

B.E. V Semester Electronics & Telecommunication Engineering
Microprocessors and Interfacing

5-ET-5

UNIT-I:

Approach to integrated system Design using Microprocessor, Bus concepts, Address Data & Control, organisation of a computer with MPU. Bits/Bytes/Words/ Long Words their ranges - accuracy-& precision Memory organisation, linear/ Absolute decoding.

UNIT-II :

Introduction to Intel's 8085 A Architecture -description, software Instruction, Addressing modes-Timing Diagrams, Assemblers & Dissembles -(by Hand Coding).

UNIT-III:

Flag structure, concept of PSW stacks & subroutines-simple &Nested, PUSH, POP Instructions & CALL/RETURN instructions, Stack manipulation, Simple programs.

UNIT-IV:
Interrupts-concept and structure in 8085. Interrupt service routine, advanced instructions & Programming of 8085 A.
UNIT-V:
Methods of data transfer-serial, parallel, synchronous & asynchronous IN/OUT instructions. Timing diagrams simple hardware interface to 8085 of standard Latches/Buffers/Keys /Displays as I/O ports. Handshaking concepts Architecture and interface of 8255 & 8085. Interfacing of ADC & DAC, Stepper motor Interface with 8085.
UNIT VI:
Hardware consideration-bus contention, slow memory interfacing, complete signal description of 8085, multiplexed keyboard/display interface and assembler directives. General awareness about microcomputer system related products.
Text Books:
1. Programming & Interfacing 8085 A.Wiley Eastern: Gaonkar
2. Programming of 8085, McGraw Hill: D.V.Hall

Reference Book:
1. Microprecessor and Interfacing: Barry Brey

B.E. VI Semester Electronics & Telecommunication Engineering
Fields and Radiating Systems

6-ET-1
UNIT–I:
Guided waves: Waves between parallel planes, TE, TM, TEM waves and their characteristics, Attenuation in parallel plane guides, wave impedances.
UNIT-II:
Rectangular waveguides: TM, TE waves in rectangular guides and their characteristics, wave velocity, guide wavelength, wave impedances, field configurations.
UNIT-III:
Transmission lines: Transmission line equations and their solution. Transmission line parameters, characteristic impedance, propogation constant, attenuation constant and phase constant, waveform distortion, distortionless transmission lines, loading of transmission lines, reflection coefficient and VSWR.Equivalent circuits of transmission lines, transmission lines at radio frequency, open and short circuited lines, smith chart, stub matching.
UNIT-IV:
Scalar and vector potentials, retarded potentials, field due to a current elements, power radiated and radiation resistance for field due to a dipole, power radiated and radiation resistance, reciprocity theorem applied to antennas gain and aperture of an antenna, radiation intensity, directivity and antenna gain.
UNIT-V:
Two element arrays and their directional characteristics, linear array analysis, broadside and end-fire arrays, pattern multiplication, binomial arrays, Design of broadcast array for a specific pattern.
UNIT-VI:
Basic principles of parabolic reflectors, analysis and power pattern, lens antennas, folded dipole, turnstile and yagi antenna, log-periodic antennas, horn antennas, traveling wave antennas,cassegrain antenna.
Books: -
1. Electromagnetic waves and radiating systems: Edward C.Jordan & Keith G. Balmain
2. Antennas: Krauss.

Reference Book:
1. Communication Electronics: George Kennedy

B.E. VI Semester Electronics & Telecommunication Engineering
Control System Engineering

6-ET-2
UNIT-I:
Introduction to need for automation and automatic control, use of feedback, Broad spectrum of system application. Mathematical modelling, Diff.equations, transfer functions, block diagram, signal flow graphs, Application to elementary system simplifications, Effect of feedback on parameter variation, disturbance signal, servomechanisms and regulators. Control system components, Electrical. Electromechanical, hydraulic, pneumatic and other components. Their functional analysis and input, output representation.
UNIT-II:
Time response of the system, first order & second order system, (standard input) concept of gain & time constant, steady state error, type of control system, approximate method for higher order system.
UNIT-III:
Root location and its effect on time response, elementary idea of Root Locus, effect of adding pole and zero and proximity of imaginary axis.

UNIT-IV:
Stability of control systems, conditions of stability characteristic equation, Routh Hurwitz criterion, special cases for determining relative stability.
UNIT-V:
Frequency response method of analysing linear system, Nyquist & Bode Plot, stability & accuracy analysis from frequency response, open loop & closed loop frequency response.
Nyquist criteria, effect of variation of gain & addition of poles & zeros on response plot, stability margin in frequency response.
UNIT-VI:
State variable method of analysis, characteristic of system, state choice of state representation of vector matrix differential equation, standard form, relation between transfer function and state variable.

Text Books:
1. Control system analysis: Nagrath and Gopal
Reference Book:
1. Linear system analysis : D. Azzo & Honpis, 1975

(Practical based on the above syllabus.)

B.E. VI Semester Electronics & Telecommunication Engineering
Line Communication & Switching System

6-ET-3
UNIT: I
Telegraphy: telegraph codes, morse code, cable code, 7.5 unit code, telegraph speed, baud, morse key, morse sounder, telegraph relays, polarised and non-polarised relays, operate and release lag, telegraph distortion. Telegraph circuit: simplex and duplex telegraph ckt, differential duplex ckt, bridge duplex telegraph ckt, telegraph repeater.
UNIT:II
Teleprinter, teleprinter transmitter receiver, baudat multiplex, telex, fascimile.
UNIT:III
Manual telephony: telephone transmitter and receiver, side tone, strowger exchange, subscribers telephone set, principles of manual switching system, electronic telephone, transmission bridge, local and central battery system, telephone relays, trunk exchange, junction working.
UNIT: IV
Automatic telephony: strowger exchange, line switches and selectors, ringing and tone ckt, subscriber uniselsctor ckt, hybrid coil, line balancing n/w, two and four wire repeaters, trunking diagram, cross bar switching system, traffic engg, traffic unit, grade of service, calculation of switches and selectors, director systems, busy hour call attempts(bhca).
UNIT: V
electronic switching systems: pcm principles, companding, hdba, coding borscht function, subscriber line interface ckt (slic), trunk side interface, cas, ccs, ccitt no. 7 signalling, cellular telephony, introduction to isdn.
UNIT: VI
I carrier communication: carrier equipments, attenuator,
Equilizer filters, long haul carrier telephone system, power line carrier communication.
Text Books:
1. Telegraphy by M.B. Bishwas
2. Telephony by N.M. Bishwas

B.E. VI Semester Electronics & Telecommunication Engineering
Communication Electronics

6-ET-4
UNIT-I:
Frequency spectrum of electromagnetic waves, their properties, wave propagation etc.Tuned Amplifiers, gain and bandwidth, neutralization, Noise, types, source, noise figure calculation.
UNIT-II :
AM .modulators, series plate modulated class 'C' amplifier, efficiency and power calculations, SSB modulation SSS-SC modulations. A.M. Demodulators, square law detector, diode peak detector, envelope detector, detectors for SSB and SSB-SC AM signals, AM using transistors .
UNIT-III :
Angle Modulation, Frequency modulation spectrum, Reactance tube and FET modulators Armstrong method, .F.M. transmitters, frequency stabilization methods. FM discriminator .Foster Selly, PLL detectors, .stereophonic FM.
UNIT-IV:

Pulse modulation, pulse amplitude modulation (PAM), Pulse width Modulation (PWM), Pulse Position Modulation (PPM), Pulse code modulation (PCM), Delta Modulation DM).

UNIT-V:

Radio Receivers and its measurements: TRF receiver, superhetrodyne receiver. Detailed study of block schematic and circuits of mixer, RF-stage, I .F stage detector, Automatic gain control (AGC), FM radio receivers.

Receiver Measurements: Sensitivity, selectivity, image frequency rejection etc. communication Receiver, block schematic and its special features.

UNIT-VI:

Line telephony: Elementary phone System, central switching, simple exchange, two and four wire connections, Time division multiplexing, Analog Time division switching, time slot interchanging (TSI), space array for digital signal, combined space time switching.

Text Books:

1. Communication Electronics: Kennedy, TMH
2. Communication Electronics: Deshpande, TMH

Reference Book:

1. Communication Electronics: Forest Bakeries
2. Radio Communication: Miller
3. Electron Tybe Circuits: Seely
4. Principals of Communication System: Taub and Schilling,PHI
5. Communication Electronics: Roddy and Coolen, PHI

(Practical based on the above syllabus.)

B.E. VI Semester Electronics & Telecommunication Engineering
Computer Organisation

6-ET-5

UNIT-I

Resister Level Design: General characteristic, description languages, combinational and sequential components, design methods. Processor level design– components, design techniques.

UNIT-II:

Processor design : Processor organisation, information representation, number formats. Instruction set, instruction formats, instruction types, multiplication and division ALU design, floating point arithmetic, IEEE 754 floating point formats.

UNIT-III:

Control design: Instruction sequencing, interpretation, hard wire control design, methods, multiplier and CPU control unit. Micro programmed Control**:** Basic concept, minimizing microinstruction size, multiplier control unit Micro programmed Computers: CPU control unit. A conventional & inconventional computers.

UNIT-IV:

Memory organisation: Device characteristics, RAM, serial access memories, Virtual memory, concept of Cache memory & associative memories.

UNIT V:

System Organisation: Local & long distance communication, Input & output system, Interrupts, DMA, introduction to parallel processing.

UNIT VI:

Concept of parallel processing, pipelining, vector processors, Introduction to RISC
architecture, data flow architecture.

Text Books:

1. A.S Tanen Baum, "Structured computer Organisation" Third edition, PHI
2. Y. Chu 11 Computer organisation & Microprogramming. Prentice Hall, Englewood Chiffs. N. J

Reference Books

1. M. H. Mano, "Computer system Architecture", Prentice Hall, Engle wood chiffs.N.J
2. C. H. Gear, "Computer organisation & Programming", McGraw Hill, N.V.
3. Computer Architecture and Organisation: J.P Hayes, Second edition, PAI.

B.E. VI Semester Electronics & Telecommunication Engineering
Electronic Workshop Practise

6-ET-6

Fabrication and testing of small electronics circuit, PCB Design and technical report presentation.

Study of Indian standards in Electronic Industry.

Manufacturing, practices in Electronic Industry.

Reference material:-

PCB Design: Boshar TMH Pub.

Elliot: Integrated circuit Fabrication Technology (TMH)
(Practicals as per above syllabus)

B.E. Seventh Semester Electronics & Telecommunication Engineering
Television Engineering

7-ET-1
UNIT I:
Standard scanning sequence, line frequency and frame frequency and frame frequency, Video bandwidth, blanking, synchronizing and equalizing pulses, composite video signal, VSB transmission and reception.

UNIT II:
TV camera tube (Monochrome), the image orthicon, vidicon and plumbicon tubes. Monochrome TV transmitter, I.F. modulation, diplexer, the sound transmitter. TV transmitter and receiving antennas, service area of a TV transmitter.
UNIT III:
TV receiver (Monochrome), Intercarrier sound system, R.F. tuner, Balun, video I.F. Amplifier, video detector and video amplifier, sound I.F. take-off, Keyed AGC, Horizontal and Vertical deflection circuit and EHT generator.
UNIT IV:
Essential of colour TV, compatibility and reverse compatibility, three colour theory, the chromaticity diagram, colour TV camera, production of Luminance and colour difference signals, colour TV picture tubes, delta-Gun, P.I.L. and Trinitron tubes.
UNIT V:
Colour signal transmission and reception, frequency interfacing modulation of colour difference signal PAL colour TV system, choice of colour sub carrier frequency the PAL decoder, PAL colour receiver, comparison of PAL with NTSC and SECAM systems.
UNIT VI:
Remote control circuit, MATV CATV and CCTV systems video tape recording and playback circuit. HD & TV, TV vai satellite.

B.E. VII Semester Electronics & Telecommunication Engineering
Advanced Microprocessor & Peripherals

7-ET-2
UNIT-I:
Introduction to 16 bit microprocessors, 8086/8088 CPU architecture, memory organization, interfacing addressing modes, Instruction set, programming examples, pseudo opcodes, assembler directives.
UNIT-II:
Interfacing of peripherals 8255, 8253 & 8251. Interfacing of ADC & DAC, stepper motor, serial communication standards RS232, I^2 C Bus.
UNIT-III:
Architecture, organization operation & interfacing of 8259, ICWs, OCWS, Cascading 8279- keyboard display mode, sensor matrix mode, command words and programming DTMF transceiver (Mittel 8880), real time clock DS 1307, EEPROM.
UNIT-IV:
8086/88 maximum mode, 8087 architecture, 80386 architecture, real and protected mode, 8237 DMA controller, organization, control words.
UNIT-V:
Introduction to 8051 family architecture, pin diagram, operation, ports, addressing modes, internal & external memory, SFR, flags, organization, counters and timers, serial communication.
UNIT-VI:
8051 instruction set, interrupts, programming exercises for interfaced with keyboard, LED matrix, time delays, serial communications.
Text Books:
1. Intel Reference Manuals, Microprocessors & Microcontrollers: Intel.
2. Programming & Interfacing of 8086/8088, D.V. Hall, TMH.
3. Microcontrollers – Peatman, Mc Graw Hill.]
4. Microcontroller – Ayala, TMH.

Reference Books:
1. Advanced Microprocessors & Peripherals, A.K. Ray, (TMH)
2. Microprocessor 8086/8088 Family Programme Interfacing : Liu & Gibson

(**Practicals based on above syllabus.)**

B.E. VII Semester Electronics & Telecommunication Engineering
Digital Signal Processing

7-ET-3
UNIT -I:

Discrete time signals & systems: Discrete time signals, Discrete time systems, Linearity, causality, stability, static/dynamic, Time Invariance/Time variance, classification of discrete time system, Linear convolution, Circular convolution Cross Correlation, Autocorrelation. Linear constant coefficient difference equations, sampling theorem & sampling process. Reconstruction of sampling data, convolution.

UNIT -II:

Frequency domain representation of discrete time signals and systems, Fourier transform of discrete time signals, properties of discrete time, Fourier transform.

UNIT-III:

The Z-transform: Definition, properties of the region of convergence for the Z-transform, Z-transform properties, Inverse Z-transform using contour integration, complex convolution theorem, Parseval's, unilateral Z-transform, stability interpretation using Jury's array.

UNIT-IV:

Transform analysis of LTI system & structures for discrete-time system: Frequency response of LTI system, relationship between magnitude & phase, all pass systems, minimum phase system. Linear system with generalized linear phase. Block diagram representation & signal flow graph representation of Linear constant. Coefficient difference equations, Basic structures for IIR systems, transposed forms, basic network structures for FIR systems, lattice structures.

UNIT-V:

Filter design Techniques: Design of discrete time IIR filters from continuous time filters, frequency transformations of low pass IIR filters, Design of FIR filters by windowing, FIR filter design by Kaiser window method. Frequency sampling method.

UNIT -VI:

Discrete Fourier Transform: Discrete Fourier series, properties of discrete Fourier series, Discrete Fourier transform, properties of DFT, circular convolution using discrete Fourier transform. Decimation in time FFT algorithm, decimation in frequency FFT, FFT of long sequences using overlap add and overlap save method.

Text Books:

1. Discrete time signal processing 2nd Ed. Alan V. Oppenheim, Ronald W. Schafer & Buch, Pearson.
2. Digital Signal Processing - A Computer based approach. Sanjit K. Mitra.

Reference Books:

1. Digital signal Processing Theory and application. Proakis and Manolakis – 3rd edition PHI Ltd.

Practicals:

Digital Signal Processing**: Suggested experiments are as follows**

1. Signal generation, sampling principles.
2. Convolution.
3. LTI system characteristics
4. DTFT & Properties.
5. Z-transform and applications, solution of difference equation.
6. DFT, FFT linear & circular convolution.
7. Design of IIR filter.
8. Design of FIR filter.
   - Windows method.
   - Kaiser window method.

Note: At least one experiment with C and At least one with MATLAB.

Optional – with DSP kit and Excel.

B.E. VII Semester Electronics & Telecommuication Engineering
Digital Communication

7-ET-4

UNIT- I:

Digital modulation: - PCM systems, Channel capacity, Delta modulation, Adaptive digital waveform coding schemes, matched filter receiver.

Coherent Binary: PSK, FSK, QPSK, MSK, DPSK.

UNIT-II:

Source coding methods: - Review of information theory, Huffman and L-Z encoding algorithm. Rate distortion theory for optimum quantization, scalar and vector quantization.

UNIT-III:

Waveform coding methods, ADPCM, Adaptive sub-band and transform coding, model based speech coding like LP coding , CELP coding. Introduction to Image compression, Review of techniques used in JPEG and MPEG standards.

UNIT- IV:

Advanced modulation methods:-The signal space concept, Gram-Schmitt procedure, Signal space representation of modulated signals, nonlinear modulation methods with memory, Error probability and optimum receivers for AWGN channels.

UNIT-V:
Advanced transmission methods:- Review of channel coding , convolution, encoding and decoding , distance properties, Viterbi algorithm and Fano algorithm. Trellis coded modulation methods.
UNIT-VI:
Spread - Spectrum methods:- Study of PN sequences, direct sequence methods, Frequency hop methods, digital spread spectrum, slow and fast frequency hop, performance analysis, synchronization methods for spread spectrum. Application of spread spectrum, CDMA.
Text Books:
1. Digital communication: John G Prokis (TMG)
2. Digital communication: Simon Haykin (WEP)
Reference Books:
1. Modern Communication systems (Principles and application):Leon W. Couch II (PHI)
2. Digital Communication: Shanmugam

B.E. VII Semester Electronics & Telecommunication Engineering
Digital System Design

7-ET-5DSD
UNIT-I:
Introduction to VHDL, design units, data objects, signal drivers, inertial and transport delays, delta delay, VHDL data types, concurrent and sequential statements.
UNIT-II:
Subprograms – Function, Procedures, attributes, generic, generate, package, IEEE std logic library, file I/O, test bench, component declaration, instantiation, configuration.
UNIT-III:
Combinational logic circuit design and VHDL implementation of following circuits – Fast adder, subtractor, decoder, encoder, multiplexer, ALU, barrel shifter, 4 X 4 key board encoder, multiplier, divider, Hamming code encoder and correction circuits.
UNIT-IV:
Synchronous sequential circuit design – Finite state machines, Mealy and Moore, state assignments, design and VHDL implementation of FSMs, Linear feedback shift register (pseudorandom and CRC).
UNIT-V:
Asynchronous sequential circuit design – primitive flow table, concept of race, critical race and hazards, design issues like metastability, synchronizers, clock skew and timing considerations.
UNIT-VI:
Introduction to place & route process, Introduction to ROM, PLA, PAL, Architecture of CPLD (Xilinx / Altera), FPGA architecture (Xilinx / Altera).
Text Books:
1. VHDL – 3rd Edition – Douglas Perry – TMH
2. Fundamentals of Digital Logic with VHDL design – Stephen Brown, Zvonko Vranesic – TMH.
3. Digital Design principles – Fletcher
4. VHDL Synthesis – J. Bhasker
5. VHDL Primer – J .Bhasker – Pearson Education
Reference Books:
1. Digital System Design Using VHDL – Chales H. Roth
2. Digital System Design – John Wakerley
3. VHDL – Zainalabedin Navabbi.
4. VHDL – D. Smith.

(Practicals based on above syllabus)
B.E. VII Semester Electronics & Telecommunication Engineering
Radar Engineering

7-ET-5RE

UNIT-I	RADAR Range Equation, CW and FM modulated RADAR.
UNIT-II	MTI and Pulse Doppler RADAR, Tracking RADAR.
UNIT-III	RADAR transmitter, Magnetron oscillator, Traveling tube amplifier, Klystron amplifier, Modulator.
UNIT IV	RADAR antennas, Parabolic reflector, Scanning field reflector, Lens antennas.
UNIT-V	RADAR Receivers, Displays and Duplexer, Detection of RADAR; signals in noise.
UNIT-VI	RADAR clutter, Effects of weather on RADAR, Detection of targets in Precipitation, synthetic Aperture RADAR, HF over the Horizon RADAR.

BOOKS:-

1. Introduction of RADAR system By Skolnik (McGraw Hill)
2. Principles of RADAR system By Herts & Coates (McGraw Hill)
3. Introduction to RADAR system By Kingslles (McGraw Hill)
4. Navigational Aids By Sen & Bhattacharya.

B.E. VII Semester Electronics & Telecommunication Engineering
Satellite Communication

7-ET-5SC

UNIT-I:

Introduction:- Origin of Satellite communication. Current state of satellite Communication.

Orbital aspect of satellite communication:- Orbital mechanism, equation of orbit, locating satellite in orbit, orbital elements, orbital perturbation .

Space craft subsystem:- Attitude and orbit control system, Telemetry tracking and command power system , communication subsystem.

UNIT-II:

Satellite link design:- System noise temperature and G/T ratio, down link design, domestic satellite system, uplink design, design of satellite link for specified (C/N).

UNIT-III:

Multiple access techniques: - FDMA, FDM/FM/FDMA , effects of intermodulation, companded FDM/FM/FDMA. TDMA, TDMA frame structure and design, TDMA synchronization and timing, code division multiple access, SS transmission and reception applicability of CDMA to commercial system, multiple access on board processing, SCPS system, digital speech interpolation system, DAMA.

UNIT-IV:

Propagation on satellite:- Earth's path—propagation effects, atmospheric absorption, Scintillation effects. Land and Sea multipath, Rain and ice effects, Rain drop distribution, calculation of Attenuation. Rain effects on Antenna noise temperature. Eliminating propagation effects: - Attenuation, Site diversity, Depolarization.

UNIT-V:

Encoding and forward error correction: Error detection and correction, channel capacity, error detecting codes, linear block codes, error correction with linear block codes, performance of block error correction codes, convolution codes, cyclic codes, BCH codes, error detection on satellite links.

UNIT-VI:

Earth Station technology – Earth Station design antennas tracking, LNA, HPA, RF multiplexing, factors affecting orbit utilization. Tracking, equipment for earth stations.

Text Books:

1. Satellite Communication by T. Pratt
2. Satellite Communication by D.C. Agrawal
3. Satellite Communication by Dennis Roddy
4. Satellite Communication by T.T. Hai

B.E. VIII Semester Electronics & Telecommunication Engineering
Electronic System Design

8-ET-1

UNIT-I:

Design of Power supply system: Unregulated D.C. power supply system with rectifiers and filters. Design of emitter follower regulator, series regulators; overload protection circuits for regulators. Design of SMPS: Step up and step down.

UNIT-II:

Design of class A small signal amplifiers: Emitter follower, Darlington pair amplifiers with and without Bootstrapping, Two stage direct coupled amplifier. Design of class A, Class AB audio power amplifier with drivers.

UNIT -III:

Design of sinusoidal oscillators: OPAMP based Wein Bridge and Phase Shift oscillators with AGC circuits, Transistor based Hartley, Colpitts and Crystal oscillators, Evaluation of figure of merit for all above oscillator circuits.

UNIT-IV:

Design of constant current sources, Design of function generators, Design of tuned amplifiers. Design of Butterworth, Chebyshev filters upto sixth order with VCVS and IGMF configuration.

Text Books:

1. Regulated Power supply Handbook. Texas Instruments.
2. Electronics : BJT's, FETS and Microcircuits – Anielo.
3. Monograph on Electronic circuit Design : Goyal & Khetan.

(Practicals based on above syllabus.)

Note: 50% practicals should be based on SPICE simulation.

B.E. VIII Semester Electronics & Telecommunication Engineering
UHF & Microwave

8-ET-2

UNIT-I:

Causes of failure of conventional tubes at high frequency. Two cavity klystron amplifier, Reflex klystron oscillator.

UNIT- II:

Traveling wave tube, Slow wave structure. Backward wave architecture (Carcinotron)

Magnetron: cylindrical magnetron, parallel plate magnetron, voltage tunable magnetron.

UNIT -III:

Microwave components : Attenuators , Tees , Directional couplers , Circulators ,Isolators, Gyrators, Phase shifter , Cavity resonator, Transmission line resonator.

UNIT -IV:

Scattering matrices: Scattering matrices of transmission lines, microwave junction and tees, directional coupler ,circulator.

UNIT -V:

Microwave filters: Design of microwave filters by Image parameter method, Insertion loss method.

Microwave measurement: microwave power measurement - Bolometer method and Calorimeter method, VSWR measurement, Attenuation measurement, Impedance and Q factor measurement.

UNIT-VI:

Microwave solid state devices : GaAs oscillator, Parametric amplifier ,PIN diode, Detector diode ,MASER.

Strip lines: Microstrip lines, coplanar, shielded, parallel strip lines.

Text Books:

1. Microwave device and circuits: Samuel Y.Lio
2. Foundations of microwave engineering : R.E. Collins.
3. Microwave engineering : R Chatterjee.

Reference books:

1. Microwave communication: Hund
2. Microwave theory and measurement: G. Lance.

(Practicals based on above syllabus.)

B.E. VIII Semester Electronics & Telecommunication Engineering
Mobile Communication

8-ET-3

UNIT-I:

The cellular concept: Evolution of mobile radio communication. Cellular telephone system, frequency reuse, channel assignment and handoff strategies, interference and system capacity, trunking and grade of service, improving capacity in cellular system.

UNIT-II:

The mobile radio environment: causes of propagation path loss, causes of fading -long term and short term, definition of sample average, statistical average, probability density function, cumulative probability distribution, level crossing rate and average duration of fade, delay spread, coherence bandwidth, intersymbol interference.

UNIT-III:

Modulation techniques for mobile communication: BPSK, QPSK. Transmission and detection techniques, 4 QPSK transmission and detection techniques. QAM, GMSK.

UNIT-IV:

Equalization, diversity and channel coding: fundamentals of equalization, space polarization, frequency and time diversity techniques, space diversity, polarization diversity, frequency and time diversity, fundamentals of channel coding.

UNIT-V:

Multiple access techniques: Introduction to multiple access, FDMA, TDMA, Spread spectrum multiple access, frequency hopped multiple access (FHMA), code division multiple access (CDMA), space division multiple access (SDMA).

UNIT-VI:

GSM - Global system for mobile: Services and features, GSM system architecture, GSM radio subsystem, GSM channel types, GSM frame structure, signal processing in GSM, introduction to CDMA digital cellular standard.

Text Books:

1. Wireless Communication – Principles and practice by T S. Rappaport.
   (Prentice Hall PTR, upper saddle river, New Jersey.)
2. Mobile Communications – Design fundamentals by William C. Y. Lee, (John Willey)

Reference Books:

1. Wireless digital communication by Kamilo Feher (PHI)
2. Mobile Cellular Communication by W.C.Y.Lee (Mc Graw Hill)

3. The Mobile Radio Propagation channel by J.D. Parson.

B.E. VIII Semester Electronics & Telecommunication Engineering
Optical Communication

8-ET-4

UNIT-I:

Principle of optical communication- Attributes and structures of various fibers such as step index, graded index mode and multi mode fibers. Propagation in fibers-Ray mode, Numerical aperture and multipath dispersion in step index and graded index fibers. Material dispersion and frequency response.

UNIT-II:

Electromagnetic wave equation in step index and graded index fibers Modes and Power flow in fibers. Manufacture of fibers and cables, fiber joints, splices and connectors.

UNIT-III:

Signal degradation in fibers - Attenuation, material dispersion, waveguide dispersion pulse broadening, mode coupling.

UNIT-IV:

Optical sources - LED and LASER. Structures and properties. Source launching and coupling.

UNIT-V:

Photo detector - Pin and Avalanche Photo-detectors. Structures and Properties.
Optical receiver-Operation and performance.

UNIT-VI:

Transmission link - Point to point links, WDM, Data buses, star and T-coupler, NRZ, RZ and block codes. Measurement in optical fibers-Attenuation, dispersion, Refractive index profile and optical source characteristic measurements.

Text Books:

1. Optical fiber communication, principles and practice: John M. Senior (PH International Service).
2. Optical fiber communication : B. Keiser (Mc Graw Hill)
3. Optical communication system : J. Gower (Prentice Hall of India)
4. Optical Fiber System : Kao (Tata Mc Graw Hill)

B.E. VIII Semester Electronics & Telecommunication Engineering
Computer Communication Network

8-ET-5CCN

UNIT-I:

Network & Services: Communication Network, Approaches to network Design, types of Network, Two Stage, Three stage Network, Time Division Switching, Time Multiplexed Switching. Time Multiplexed Time Switching.

UNIT-II:

LAN Network & Medium Access layer : LAN structure, random access, multiple access protocols, IEEE standard 802 for LAN & MAN. High speed LANS, FDDI, Fast Ethernet.

UNIT-III:

Application & Layered Architecture: OSI reference Model, TCP/IP Architecture, TCP/IP protocol, IP packets, IP addressing, subnet addressing, address resolution & reverse resolution, TCP/IP utilities.

UNIT-IV:

Physical Layer & Data Link Layer: Transmission media, wireless Transmission, X.25 network, Narrow band & Broadband ISDN, ATM. Data link Layer design, Error detection & correction Elementary data link protocols, sliding window protocols.

UNIT-V:

Network Layer & Transport Layer : Network layer design, Routing, congestion, Internetworking Transport layer design issues, Transport services primitives, Internet transport protocol, wireless TCP and UDP.

UNIT-VI:

Application Layer : Network security cryptography , secret key, public-key digital signature, Domain Name system, Electronic Mail system, Multimedia, Real Time Transport protocol.

Text Books:

1. Telecommunication Switching systems & Networks by Vishwanathan
2. Communication Networks by Leon- Gracia, Indra Widjaja
3. Computer Communication by W. Stanlling.
4. Computer Networks - Tanenbaum.

B.E. VIII Semester Electronics & Telecommunication Engineering
Fuzzy Logic & Neural Network

7-ET-5FLNN

UNIT-I:

Introducion:

1. Fuzzy sets, relations, approximate reasoning, Representing set of rules. 2. Fuzzy knowledge based (FKBC) parameters. Introduction rule and data base inference engine choice of fuzzification and defuzzification processes.

UNIT- II:

Nonlinear Fuzzy Control: Introduction, Control Problem, FKBC as nonlinear transfer element, Types of FKBC.

UNIT -III:

Adaptive Fuzzy Control: Introduction, design and performance evaluation, main approach to design.

UNIT -IV:

Fundamental concepts of ANN. Model of artificial Neural Network (ANN), Learning and adaptation learning rules. Feed forward Networks: Classification Model, features and decision, regions, Minimum distance classification, perceptron, Delta learning rules for multiperceptron layer, generalized learning rules, back propagation Algorithm; back propagation training, learning factors.

UNIT V:

Recurrent Networks: Mathematical foundation of discrete time & gradient type Hopfield networks, Transient Response and relaxation modeling.

UNIT VI:

Associative Memories & self organizing Networks: Basic concepts and performance analysis of recurrent associative memory, Bidirectional associative memory. Hamming net and MAXNET, Unsupervised learning of clusters, counter propagation network, feature mapping, self organizing feature maps, cluster discovery network (ART1)**.**

Text Books:

1. Introduction of Artificial Neural Networks, Jacek Zurada (JPH)
2. Neural Network and Fuzzy Systems, Bart Kosko (PHI)
3. Neural Networks: A comprehensive Foundation, Simon Haykin (Maxwell) Macmillan Canada Inc).

Reference Books:

1. An Introduction to Fuzzy Control, D. Driankov, Norsa.
2. Fuzzy sets: Uncertainty & information, Klir and Folger (PHI)
3. Digital Image processing (AWPC) By Gonzalez

B.E. VIII Semester Electronics & Telecommunication Engineering
Digital Image Processing

8-ET-5DIP

UNIT- I:

Digital image representation, elements of digital image processing systems, sampling and quantization, simple image model, basic relationships between pixels and image geometry.

UNIT – II:

Image transforms – Introduction to Fourier transform, DFT, properties of 2- dimensional DFT, FFT, Others separable image transforms – DCT, DST, Walsh, Haar, start transforms.

UNIT -III:

Image enhancement - Basic gray level transformations, Histogram processing enhancement using arithmetic/logic operations, spatial filtering, smoothing and sharpening filters, smoothing frequency domain filters, sharpening frequency domain filters.

UNIT –IV:

Image Compression - Fundamentals, image compression modules, information theory, error - free compression, lossy compression, image compression standards.

Unit- V:

Image Segmentation - Detection of discontinuities, Edge linking and boundary detection, thresholding region based segmentation.

UNIT – VI:

Representation & Description – Representation, boundary descriptors, regional descriptors.

Text Books:

1. Digital image processing, R.C. Gonzaalez, R.E. Woods, Pearson Edition, 2nd Edition.
2. Fundamentals of Digital Image Processing, A.K. Jain (PHI)