Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(1 st SEMESTER)

(Common to all Branches)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-102	English Language **OR**	2	2	-	4	75	25	-	100	3
2	MET-102	Manufacturing Processes	3	1	-	4	75	25	-	100	3
3	HUT-104	Engineering Economics **OR**	3	1	-	4	100	50	-	150	3
4	ECT-103	[Basic Electronics Eng. and	2	2/2	-	3	75	25	-	100	3
5	ECT-105	Basic Electronics Eng. (Pr)]	-	-	2/2	1	-	10	40	50	3
6	MAT-103	Mathematics-I	3	2	-	5	100	25	-	125	3
7	PHT-104	Physics-I	3	1	-	4	100	25	-	125	3
8	CHT-104	Chemistry - I	3	1	-	4	75	25	-	100	3
9	ELT-102	Basic Electrical Engineering **OR**	2	2/2	-	3	75	25	-	100	3
10	COT-103	Computer Engineering *	2	2/2	-	3	75	25	-	100	3
11	CET-102	Engineering Graphics-I	-	-	3	3	75	25	-	100	4
12	PHT-105	Physics-I (Pr)	-	-	2	2	-	10	40	50	3
13	CHT-105	Chemistry-I (Pr)	-	-	2	2	-	10	40	50	3
14	ELT-104	Basic Electrical Engineering.(Pr)	-	-	2/2	1	-	10	40	50	3
15	COT-105	**OR** Computer (Pr) *	-	-	2/2	1	-	10	40	50	3
16	MET-104	Workshop-I (Pr)	-	-	3	3	-	10	40	50	3
TOTAL			15/17	8/7	12/11	35	575/600	225/240	200/160	1000	

- HUT-102 and (ECT-103 +ECT-105) will be offered to first half of the students strength, i.e. (ECE + CO) students.
- HUT-104 and MET-102 will be offered to second half of the students' strength, (i.e. E+M+C) students.
- (ELT-102 + ELT-104) will be offered to (ECE+CO) students
- (COT-103 + COT-105) will be offered to (E+M+C) students

* All engineering departments will share the teaching as well as the examinations.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(2 nd SEMESTER)

(Common to all Branches)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MET-102	Manufacturing Processes **OR**	3	1	-	4	75	25	-	100	3
2	HUT-102	English Language	2	2	-	4	75	25	-	100	3
3	HUT-104	Engineering Economics **OR**	2	2/2	-	3	100	50	-	150	3
4	ECT-103	[Basic Electronics Eng. and	2	1	-	3	100	-	-	100	3
5	ECT-105	Basic Electronics Eng.(Pr)]	-	-	2/2	1	-	10	40	50	3
6	MAT-104	Mathematics-II	3	1	-	4	75	25	-	100	3
7	PHT-106	Physics-II **OR**	3	1	-	4	75	25	-	100	3
8	PHT-108	Physics-II	3	1	-	4	75	25	-	100	
9	CHT-106	Chemistry-II	2	1	-	3	75	25	-	100	3
10	COT-103	Computer Engineering **OR**	2	2/2	-	3	75	25	-	100	3
11	ELT-102	Basic Electrical Eng.	2	2/2	-	3	75	25	-	100	3
12	MET-105	Engineering Graphics-II	-	-	6	6	100	50	-	150	4
13	PHT-107	Physics-II (Pr) **OR**	-	-	2/2	1	-	25	25	50	3
14	PHT-109	Physics-II (Pr)	-	-	2/2	1	-	25	25	50	3
15	CHT-107	Chemistry-II (Pr)	-	-	2	2	-	25	25	50	3
16	MET-106	Workshop-II (Pr)	-	-	3	3	-	25	25	50	3
17	COT-105	Computer (Pr) * **OR**	-	-	2/2	1	-	10	40	50	3
18	ELT-104	Basic Electrical Engineering (Pr)	-	-	2/2	1	-	10	40	50	3
Total			14/15	7/7	14/13	35	575/575	270/310	155/115	1000	

- HUT-102 and (ECT-103 +ECT-105) will be offered to half of the students strength ,i.e.(E+M+C) students.
- HUT-104 and MET-102 will be offered to half of the students' strength , i.e. (ECE+CO), students.
- (ELT-102 + ELT-104) will be offered to (E+M+C) students
- (COT-103 + COT-105) will be offered to (ECE+CO) students
- (PHT-106+PHT-107) will be offered to (ECE+CO+E) students and (PHT-108+PHT-109) will be offered to (C+M) students.

* All engineering departments will share the teaching as well as the examinations.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(3 rd SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-201	Industrial Sociology	2	1	-	3	75	50	-	125	3
2	ECT-201	Semiconductor Devices & Applications	4	2	-	6	100	50	-	150	3
3	ECT-203	Network Analysis & Synthesis	3	2	-	5	75	50	-	125	3
4	ECT-205	Fields & Waves	4	1	-	5	100	50	-	150	3
5	ECT-207	Signals & Systems	4	2	-	6	100	50	-	150	3
6	ECT-209	Digital Circuits & Systems	3	2	-	5	100	50	-	150	3
7	ECT-211	Electronics Devices & Circuits(Pr)	-	-	2	2	-	25	25	50	3
8	ECT-213	Internet Applications (Pr)	-	-	3	3	-	50	50	100	3
		Total	20	10	5	35	550	375	75	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(4 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MAT-202	Numerical Analysis	3	1	-	4	75	50	-	125	3
2	ECT-202	Analog Electronics	4	1	-	5	100	50	-	150	3
3	ECT-204	Analog Communication	4	2	-	6	100	50	-	150	3
4	ECT-206	Instrumentation & Measurement	4	1	-	5	100	50	-	150	3
5	ECT-208	Control Systems	4	2	-	6	100	50	-	150	3
6	MET-202	Workshop-II (Pr)	-	-	2	2	-	25	25	50	3
7	ECT-210	Electronic Circuit Simulation (Pr)	-	-	4	4	-	75	50	125	3
8	ECT-212	Communication-I (Pr)	-	-	3	3	-	50	50	100	3
		Total	19	7	9	35	475	400	125	1000	

NOTE: Students will undergo a practical training of 6 weeks duration after the 4th semester examination.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(5 th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	ECT-301	Antenna and Wave Propagation	3	1	-	4	75	50	-	125	3
2	ECT-303	Computer Architecture & Organization	3	2	-	5	75	50	-	125	3
3	ECT-305	Information Theory and Coding	3	2	-	5	75	50	-	125	3
4	ECT-307	Linear IC Applications	3	2	-	5	75	50	-	125	3
5	ECT-309	Micro-Electronics	3	2	-	5	75	50	-	125	3
6	ECT-311	Microprocessors	3	2	-	5	75	50	-	125	3
7	ECT-313	Communication-II (Pr)	-	-	2	2	-	50	25	75	-
8	ECT-315	Microprocessors (Pr)	-	-	3	3	-	50	25	75	-
9	ECT-317	Seminar	-	1	-	1	-	25	-	25	-
10	ECT-319	Training Report	-	-	-	-	-	75	-	75	-
Total			18	12	5	35	450	500	50	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(6 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-302	Fundamentals of Management	3	1	-	4	75	50	-	125	3
2	ECT-302	Microwave Engineering	3	2	-	5	75	50	-	125	3
3	ECT-304	VHDL & Digital Design	3	1	-	4	75	50	-	125	3
4	ECT-306	Digital Signal Processing	3	2	-	5	75	50	-	125	3
5	ECT-308	Digital Communication	3	2	-	5	75	50	-	125	3
6	ECT-310	Computer Communication Networks	3	1	-	4	75	50	-	125	3
7	ECT-312	Digital Communication (Pr)	-	-	2	2	-	50	25	75	3
8	ECT-314	Electronic Design (Pr)	-	-	3	3	-	50	25	75	3
9	ECT-316	VHDL (Pr)	-	-	2	2	-	50	25	75	3
10	ECT-318	Seminar	-	1	-	1	-	25	-	25	-
Total			18	10	7	35	450	475	75	1000	

NOTE: Students will undergo a practical training of 6 weeks duration after the 6th Semester exam.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(7 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	-	Open Elective-I	3	1	-	4	75	50	-	125	3
2	-	Departmental Electives-I	3	2	-	5	75	50	-	125	3
3	ECT-401	Practical Training Report	-	-	-	-	-	75	-	75	-
4	ECT-403	Physical Design of Digital IC's	3	2	-	5	75	50	-	125	3
5	ECT-405	Television & Radar Engineering	3	1	-	4	75	50	-	125	3
6	ECT-407	Optical Communication	3	2	-	5	75	50	-	125	3
7	ECT-409	Electronic Switching Systems	3	2	-	5	75	50	-	125	3
8	ECT-411	Digital Signal Processing (Pr)	-	-	3	3	-	50	25	75	3
9	ECT-413	Minor Project	-	-	3	3	-	50	25	75	3
10	ECT-415	Seminar	-	1	-	1	-	25	-	25	-
		Total	18	11	6	35	450	500	50	1000	

DEPARTMENTAL ELECTIVES.

1. ECT-417 Micro-controllers
2. ECT-419 Bio-medical Signal Processing
3. ECT-421 Reliability
4. ECT-423 Advanced Microprocessors
5. ECT-425 Industrial Electronics
6. ECT-427 Analog MOS IC Design
7. ECT-429 Introduction to Information Technology

OPEN ELECTIVES.

	Course No.	Course Name	Available To
1.	ECT-431	e-Business	C,E,Ec,Co
2.	ECT-433	Radio and TV Engineering	C,E,Co
3.	ECT-435	Acoustic Engineering	C.E.Ec,Co
4.	ECT-437	Measurement Systems.	C,E
5.	ECT-439	Communication Engineering	E,Co
6.	HUE-461	Modern Trends in Management	
7.	HUE-463	Industrial Social Responsibility	
8.	HUE-475	Advanced Communication Skills in English	
9.	HUE-467	Development & Planning in Indian Economy	
10.	CHE-463	Chemistry of Insulating Materials	
11.	MAE-467	Advanced Mathematics-I	
12.	PHE-465	Lasers	
13.	PHE-467	Ultrasonics	
14.	PHE-469	Non-Conventional Energy Systems	
15.	COT-465	Management Information Systems	
16.	COT-461	Expert Systems & Artificial Intelligence	
17.	COT-463	Design & Analysis of Algorithms	
18.	EE-475	Electric Power Engg.	
19.	EE-471	Electric Utilization & Drives	
20.	CE-471	Finite Element Methods	
21.	ME-475	Heat Transfer & Air Conditioning	
22.	ME-477	Industrial Engg. & Organization	
23.	ME-479	Elements of Robotics.	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(8 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	-	Open Elective-II	3	1	-	4	75	50	-	125	3
2	-	Departmental Electives-II	3	2	-	5	75	50	-	125	3
3	ECT-402	Comprehensive Viva-Voce	-	-	-	-	-	75	-	75	-
4	ECT-404	General Fitness & Professional Aptitude	-	-	-	-	-	-	75	75	3
5	ECT-406	Wireless and Mobile Communication	3	2	-	5	75	50	-	125	3
6	ECT-408	Transport and Access Technologies	3	2	-	5	75	50	-	125	3
7	ECT-410	Neuro-Fuzzy Systems	3	2	-	5	75	50	-	125	3
8	ECT-412	Seminar	-	1	-	1	-	25	-	25	-
9	ECT-414	Microwave (Pr)	-	-	3	3	-	25	25	50	3
10	ECT-416	Audio Visual Electronics (Pr)	-	-	3	3	-	25	25	50	3
11	ECT-418	Major Project	-	-	4	4	-	50	50	100	-
		Total	15	10	10	35	375	450	175	1000	

DEPARTMENTAL ELECTIVES

1. ECT-420 Network Management and Security
2. ECT-422 Image Processing
3. ECT-424 Simulation Modeling and Analysis of Communication Systems.
4. ECT-426 Artificial Intelligence and Expert Systems.
5. ECT-428 Software Engineering
6. ECT-430 Advanced Control Systems
7. ECT-432 Principles of Operating Systems
8. ECT-434 Nanotechnology

OPEN ELECTIVES

	Course No.	Course Name	Available To
1.	ECT-436	IC Fabrication Processes.	E,Co
2.	ECT-438	Op-amp. Applications	C,Co
3.	ECT-440	Theory and Application of DSP.	C,E,Co
4.	ECT-442	Mobile Communication	E,Co
5.	HUE-462	Entrepreneurship	
6.	CHE-464	Polymer Technology	
7.	CE-470	Environmental Eng.	
8.	ME-476	Pollution & Noise Control	
9.	ME-478	Thermal Power Eng.	
10.	ME-480	Computer Aided Design & Manufacturing	
11.	COT-464	Memory Systems in Computers	
12.	COT-462	Cobol Programming & Data Processing	
13.	COT-466	Data Comm. & Computer Networks.	
14.	EE-472	Process Control & Instrumentation	
15.	EE-474	Digital & Non-Linear Control	
16.	EE-476	Industrial Electrical Equipment	
17.	PHE-470	Transducers & their Application	
18.	MAE-468	Advanced Mathematics-II	

B.TECH Ist andIInd SEMESTER
(Common to all branches)
BASIC ELECTRONICS ENGINEERING
(ECT-103)

L	T	P/D		
2	2/2	-	**Theory :**	**75 Marks**
			Sessional :	**25 Marks**
			Time :	**3hrs**

1. Electronic components, Signals, Networks:

-Passive Components: Resistances, Capacitors and Inductors of various types, Component Specifications, Applications, Response to dc and sinusoidal voltage/current excitations.

-Signals : DC/AC, voltage/current, periodic/non-periodic signals, average, rms, peak values, different types of signal waveforms, Ideal/non-ideal voltage/current sources, independent/dependent voltage current sources.

-Networks: Netwok theorems : KCL , KVL , Superposition , Thevenin , Norton , Millman , Maximum Power theorems . Loop and node analysis of simple networks . Steady state (including sinusoidal) and transient response of networks.

2. Basic Analog Circuits:

Operational Amplifiers-Ideal Op-Amp, Practical op-amp. , Open loop and closed loop configurations , Application of Op-Amp as amplifier, adder, differentiator and integrator.

3. **Basic Digital Electronics**

-Introduction to Boolean Algebra
-Electronic Implementation of Boolean Operations
-Gates-Functional Block Approach
-Storage elements-Flip Flops-A Functional block approach
-Counters : Ripple, Up/down and decade
-Introduction to digital IC Gates (of TTL Type)

Note for the Paper Setter:

There will be at least ONE question from unit 2 and 3 each and at least three questions from the unit 1.A total of eight questions are to be set. Candidate will have to attempt any FIVE question out of total EIGHT questions.

References:

1. Electronic Devices and Circuits by S. Salivahanan, N. Suresh Kumar, A Vallavraj, Tata Mcgraw Hill (2000)
2. Network Analysis by Van Valkenburg, PHI
3. Malvino & Leach , Digital Electronics , Tata McGraw Hill.

B.TECH Ist and IInd SEMESTER
(Common to all branches)
BASIC ELECTRONICS ENGINEERING (Pr.)
(ECT-105)

L	T	P
-	-	2/2

Viva Voce : 40 Marks
Sessionals : 10 Mrks
Time : 3 hrs.

List of Experiments:

1. Familiarization with Electronic Components and Equipment (CRO, Function Generator, DMM)-Part-I.
1. Familiarization with Electronic Components and Equipment (CRO, Function Generator, DMM)-Part-II.
2. Verification of Superposition and Millman's theorems.
3. Verification of Thevenin's and Norton's theorems.
4. Transient response of series RL, RC, RLC circuits.
5. Study of operational amplifier-Gain Vs Bandwidth response.
6. Op-Amp. Applications-adder, differentiator/integrator.
7. Verification of Truth table of Gates and Flip-flops.
8. Study of Counters.
9. Study of registers.

B.TECH IIIrd SEMESTER
SEMICONDUCTOR DEVICES AND APPLICATIONS
(ECT-201)

L	T	P		
4	2	-	Theory	: 100
			Sessional	: 50
			Time	:3Hrs

UNIT-I

INTRODUCTION: Elemental and compound semiconductors, Energy band model, electron and hole concentrations in semiconductors (Intrinsic and Extrinsic), temperature dependence of carrier concentrations.

CARRIER TRANSPORT IN SEMICONDUCTORS – Drift and Diffusion currents. Excess carriers in semiconductors– Generation and Recombination. Basic equations for semiconductor device operation.

UNIT-II

P – N JUNCTIONS: - abrupt and linearly graded junctions . V-I characteristic of an ideal diode, a real diode, C-V characteristic of a reverse biased p-n junction, Electrical breakdown of a p-n junction in reverse bias - Zener and Avalanche Breakdown. Diode circuit model. p-n junction applications – Half Wave, Full Wave and Bridge rectifier, varactor, varistor, voltage regulator, demodulator, Solar cells, diode as a switch.

UNIT-III

BIPOLAR JUNCTION TRANSISTOR**:** Structure, principle of operation, ideal and real transistor, I-V Characteristics, Small signal equivalent circuits, High frequency and Switching Transistors. Power transistors.BJT as an amplifier – Biasing, small Signal analysis of class A amplifier. Frequency response of RC coupled amplifier .BJT as a switch.

UNIT-IV

JFET: Basic Structure, Operating Principle, I-V characteristics, JFET Amplifier – Biasing, analysis of JFET Amplifier. MOSFET: Basic Structure, Enhancement & Depletion type MOSFET, I-V Characteristics, C-V Characteristics of MOS- Capacitor, Threshold Voltage, MOSFET as a Switch
MOSFET Parameters. MOSFET Amplifiers.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. MS Tyagi, Semiconductor Materials & Devices, John-Wiley
2. I.J.Nagrath, Electronics, Analog & Digital, PHI
3. B.G.Streetman, Semiconductor Devices.
4. D.Nagchaudhary, Microelectronic Devices, Pearson Education Asia

B.TECH IIIrd SEMESTER
NETWORK ANALYSIS AND SYNTHESIS
(ECT-203)

L	T	P	Theory	: 75
3	2	-	Sessional	: 50
			Time	:3Hrs

UNIT-1

NETWORK FUNCTIONS: Terminal pairs, Network functions for one port and two-port networks. Poles and Zeros of Network functions, Restrictions on Pole and Zero location for driving point functions and transfer functions. Time-domain behavior from pole and zero plots.

TWO-PORT PARAMETERS**:** Relationships of two port variables, short circuit admittance parameters, open circuit impedance parameters, Transmission parameters, Hybrid parameters, Relationships between parameter sets.

UNIT-II

FILTERS**:** Analysis of ladder and lattice networks, Image Impedances, Image transfer functions, iterative Impedances, network analysis and design of K and M – derived filters, problems of terminations, band-pass and band diminution filters, equalizers, attenuators.

UNIT-III

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

POSITIVE REAL FUNCTIONS: Identification of the network synthesis problem. Driving point functions, Brune's positive real functions properties of positive real functions.

UNIT-IV

TWO ELEMENT NETWORKS: Properties of LC and RC network functions, Foster form and Cauer form of LC, RC and RL networks.

TWO PORT SYNTHESIS: Some properties of Y12 and Z12 LC ladder development, RC ladder development.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Van Valkenburg, Introduction to Modern Network Synthesis , PHI
2. J.Tames, Lapatra, Introduction to Network Synthesis.
3. Aarte, Network Synthesis and Filter Design.
4. J.D.Ryder, Network Lines and Fields , PHI
5. G.K.Mithal, Network Analysis.
6. Van Valkenburg, Network Analysis , PHI

B.TECH IIIrd SEMESTER
FIELD & WAVES
(ECT-205)

L	T	P
4	1	-

Theory : 100
Sessional : 50
Time : 3 hrs

UNIT - I:
REVIEW OF ELECTRIC AND MAGNETIC FIELDS: Coulomb's law, electric field intensity, field due to a continuous volume charge distribution, field of a line charge, field of a sheet of charge, electric flux density, Gauss's law and applications, electric potential, the dipole, current density, continuity of current, metallic conductors, conductor properties and boundary conditions, the method of images, the nature of dielectric materials, boundary conditions for perfect dielectric materials, capacitance of two wire line, Poisson's and Laplace's equations, uniqueness theorem.
Biot - Savart law, Ampere's law, magnetic vector potentials, force on a moving charge, differential current element, force and torque on a closed circuit, the boundary conditions, the magnetic circuit, potential energy and forces on magnetic materials.

UNIT – II:
TIME VARYING FIELDS AND MAXWELL'S EQUATIONS: Faraday's law, Maxwell's equations in point form and integral form Maxwell's equations for sinusoidal variations, retarded potentials.

UNIT – III:
THE UNIFORM PLANE WAVE: Wave motion in free space and perfect dielectrics, plane waves in lossy dielectrics, the Poynting vector and power considerations, propagation in good conductors, skin effect, reflection of uniform plane waves, SWR.

UNIT – IV:
TRANSMISSION LINES AND WAVEGUIDES: The transmission line equations, graphical methods, Smith chart, Time domain and frequency domain analysis. TE, TM and TEM waves, TE and TM modes in rectangular and Circular wave guides, cut-off and guide wavelength, wave impedance and characteristic impedance, dominant modes, power flow in wave guides, excitation of wave guides, dielectric waveguides.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. E. C. Jordan and K. G. Balmain, Electromagnetic Waves and Radiating Systems, PHI.
2. David &Chang, Field and Wave Electromagnetics, Addison Wesley.
3. W. H. Hayt, Engineering Electromagnetics , JR. Tata Mc-Graw Hill Edition, Fifth edition.

B.TECH IIIrd SEMESTER
SIGNALS AND SYSTEMS
(ECT-207)

L	T	P		
4	2	-	Theory	: 100
			Sessional	: 50
			Time	: 3 hrs

UNIT I:
LTI SYSTEMS: Continuous time and discrete time signals, Even and Odd signals. Elementary continuous time and discrete time signals. Classification of signals, causality; stability, time invariance, linearity. Continuous time and Discrete time LTI Systems, convolution Integral and convolution sum, Properties of LTI Systems. Differential and Difference equations. Singularity functions.

UNIT II:
ANALYSIS OF PERIODIC SIGNALS: Fourier series representation of CTPS, convergence of FS. Properties of CTFS. Fourier series representation of DTPS. Properties of DTFS. Fourier series and LTI Systems. Filtering, RC low pass and high pass filters. Recursive and Non recursive Discrete Time filters. Sampling theorem, sampling of continuous time signal with impulse train and zero order hold. Reconstruction, Aliasing, Discrete-time processing of continuous time signals. Digital differentiator, Sampling of discrete time signals, decimation and Interpolation.

UNIT – III:
ANALYSIS OF APERIODIC SIGNALS**:** Continuous Time Fourier Transform (CTFT), Convergence of FT. Properties of CTFT. Discrete time Fourier Transform (DTFT). Properties of DTFT. Systems characterized by Linear constant co-efficient differential equation and difference equations. Magnitude and phase spectrum, group delay, Time domain and frequency domain aspects of ideal and Non-ideal filters. First order and second order continuous time and discrete time systems.

UNIT – IV:
LAPLACE TRANSFORM: The Laplace transform; Region of convergence for Laplace transform, Inverse Laplace transform. Geometric evaluation of Fourier transform from pole zero plot, First order, second order and all pass systems. Properties of Laplace transform, Analysis and characterization of LTI systems using the Laplace transform. Causality, stability, Differential equations, Butterworth and Chebychev filters. Unilateral Laplace transform, its properties and uses.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Oppenheim Willsky and Nawab, Signals and Systems, PHI.
2. Simon Haykin , Signals and Systems, John Wiley
3. Taub and Schilling, Principles of Communication Systems, TMH.
4. Dungan F R , Electronic Communication Systems , Thomson-Delmar

B.TECH IIIrd SEMESTER
DIGITAL CIRCUIT AND SYSTEMS
(ECT-209)

L	T	P		
3	2	-	Theory	: 100
			Sessional	: 50
			Time	:3Hrs

UNIT-I:
Review of Boolean Algebra,Minimization of Boolean functions: K-map, Q-M method, Map entered variable method. Combinational I.C.'s.: Gates , Multiplexers , De-multiplexers , Half and full adders , Parity Generators , Tri-state buffers, BCD to 7-segment decoders, Mono-shots , Design of combinational circuits : 2-level and multi-level.

UNIT-II:
DIGITAL LOGIC FAMILIES: Characteristics of Digital IC's, TTL and subfamilies , DCTL, I2L, ECL, nMOS, CMOS,BiCMOS , Interfacing CMOS and TTL, tristate logic.

UNIT-III:
SYNCHRONOUS SEQUENTIAL CIRCUITS: Specifications , Representation of state transition and output functions , time behavior and finite state machines . Flip-flops , counters and registers. Sequential circuit design: State equivalence , Minimization , State assignment methods.

UNIT-IV:
ASYNCHRONOUS SEQUENTIAL CIRCUITS: Introduction , Fundamental and pulse mode circuits, Deriving flow tables , state assignments,design of asynchronous sequential circuits.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Ercegovac M. , Lang T, Moreno JH , Introduction to Digital Systems , John-Wiley
2. Yarbrough JM , Digital Logic – Applications and Design , Thomson-cole
3. Kohavi Z , Switching and finite automata theory, Second edition, Tata McGraw Hill.
4. Jain RP, Modern Digital Electronics, Tata McGraw Hill Publishing Company Limited Second edition.
5. Malvino & Leach , Digital Electronics , Tata McGraw Hill.
6. Ali SN , Digital Electronics , Galgotia Publns.

B.TECH IIIrd SEMESTER
ELECTROINICS DEVICES & CIRCUITS
(ECT-211)

L	T	P	Exam	: 25
-	-	2	Sessional	: 25
			Time	: 3Hrs

LIST OF EXPERIMENTS :

1. Study of unit step response of RC & RL circuits.
2. Measurement & Study of p-n junction diode I-V & C-V characteristics.
3. Measurement & Study of p-n junction solar cell I-V characteristics.
4. Measurement & Study of input and output characteristics of a bipolar junction transistor.
5. Measurement & Study of output characteristic of a JFET.
6. Measurement & Study of output characteristics of a MOSFET.
7. Study of switching characteristics of a p-n junction diode and a bipolar transistor.
8. Verification of truth table of logic gates & flip-flops.
9. Familiarization with digital trainer kit and associated equipment.
10. Study of TTL logic family characteristics.
11. Study of Multiplexer, Demultiplexer and BCD to 7-segment decoder IC's.
12. Study of working & applications of decade counter IC's.
13. Study of working of shift registers.
14. Study of working and applications of CMOS monostable multivibrators.

B.TECH IIIrd SEMESTER
INTERNET APPLICATIONS (Pr)
(ECT-213)

L	T	P	Exam	: 50
-	-	3	Sessional	: 50
			Time	:3Hrs

LIST OF EXPERIMENTS:

1. Familiarization with PC Hardware: Functions of different parts of PC.
2. Loading Windows 98,X P and Linux Operating Systems, and drivers for different devices.
3. Installing internal & external modems for Internet connection; installing Network Interface cards, assigning IP addresses.
4. Study of different types of storage media: CDROM, CDRW, Floppy Disks, Zip Drive, Hard Disks etc.
5. Study of Internet e-mail Systems.
6. Using Search Engines to Explore Operating Systems being used.
7. Study of various types of file formats (document, audio, video, images etc) and compression tools like zip, gzip, bzip, winzip etc. Using Internet for help.
8. Using application programs to open and run edit different file types.
9. Study of Telnet and ftp programs.
10. Study of chat Servers.
11. Open and Study source code of HTML pages. Editing HTML Source codes using MS Front Page, Netscape Composer.
12. Searching Websites for specific information.

B.TECH IVth SEMESTER
ANALOG ELECTRONICS
(ECT-202)

L	T	P
4	1	-

Theory : 100
Sessional : 50
Time :3Hrs

UNIT-1:
Review of p-n junction diode , BJT, JFET and MOSFET. Diode applications in electronic circuits , Load line concepts,Types of diodes , Specifications , Applications as rectifiers , Clipping and Clamping circuits, Voltage regulator , Varactor , Demodulator. Spice model of diode.

UNIT-II :
BJT parameters , BJT equivalent circuit models- DC model , h-parameter model , r_e-model and hybrid-π model , Spice model for BJT. Single stage RC-coupled Amplifier , Load line , Biasing . Analysis and design of single stage RC- coupled amplifier , Classification of amplifiers,Direct coupled amplifiers ,Multistage amplifiers , Frequency response of amplifiers.

UNIT-III:
Power amplifiers , JFET and MOSFET parameters , JFET and MOSFET amplifiers: Biasing , Small signal analysis, High frequency limitations.

UNIT-IV :
Feedback in amplifiers:Basic feedback topologies .Oscillators : Barkhausen criterion , Sinusoidal Oscillators, the phase-shift oscillator, resonant circuit Oscillators, a general form of oscillator circuit, the Wein -bridge oscillator, crystal oscillators. Regulated power supplies: Series regulators ,three terminal IC regulators , Switched mode power supplies.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Sedra/Smith , Microelectronic Circuits Oxford University Press, Fourth edition.
2. J.Millman & C.Halkias , Integrated Electronics , McGraw Hill Book Company.
3. Burns and Bond , Principles of Electronic Circuits , Galgotia Publns.

B.TECH IV SEMESTER
ANALOG COMMUNICATION
(ECT-204)

L	T	P		
4	2	-	Theory	: 100
			Sessional	: 50
			Time	: 3 hrs

UNIT – I:
NOISE : Classification of noise, various sources of noise, methods of noise calculation in networks and interconnected networks, Addition of noise due to several sources; noise in amplifiers in cascade, noise in reactive circuits, Noise figure, its calculation and measurement. Noise temperature Mathematical representation of random noise, narrow band noise and its representation. Transmission of noise through linear systems, signal to noise ratio, noise bandwidth.

UNIT – II:
MODULATION TECHNIQUES: Basic constituents of Communication System, need of modulation, Amplitude modulation, spectrum of AM wave; modulation index, DSBSC modulation, SSB modulation, Collector modulation, Square law modulation methods. Methods of generating SSB Signals; vestigial side band modulation, Detection of AM Signal; Diode detector Synchronous detection , square law detector. Time constant RC in diode detector. Diode detector with filter. FDM. Power relations in AM wave.
Angle modulation, frequency and phase modulation spectrum of FM Wave, modulation index and Band width of FM Signal, NBFM and WBFM, Comparison between FM and PM Signals, FM and AM signals, AM and NBFM Signals, FM generation methods, Parametric variation method, slope detector, ratio detector, Foster-seeley discriminator.

UNIT – III:
TRANSMITTER AND RECEIVER : Classification of radio transmitters, Block diagram of AM transmitter, Frequency Scintillation, Frequency drift, Radio broadcast transmitter, Radio telephone transmitter, Privacy devices, Armstrong FM transmitter, Simple FM transmitter using Reactance modulator.
Classification of radio receivers, TRF receivers, superheterodyne receivers, Image Signal rejection, frequency mixers, Tracking and alignment of receivers, Intermediate frequency, AGC, AFC, SSB receiver.

UNIT – IV:
NOISE IN AM AND FM : Noise in DSBSC, SSB-SC, and DSB Systems, and square law demodulator, and the envelope demodulator. Noise in FM systems, comparison of AM and FM based on noise calculations. Pre-emphasis and de-emphasis. Effect of modulation index. Threshold in FM. Comparison between FM and PM in multiplexing. Effect of noise on carrier, the noise triangle.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Taub & Schilling, Principles of Communication Systems, TMH.
2. G.K.Mithal, Radio Engineering, Khanna Publication.
3. Simon Haykin, Communication Systems, John Wiley.
4. Dungan FR , Electronic Communication Systems , Thomson-Delmar

B.TECH IVth SEMESTER
INSTRUMENTATION AND MEASUREMENT
(ECT-206)

L	T	P	
4	1	-	

Theory : 100
Sessional : 50
Time :3Hrs

UNIT-I:
MEASUREMENT AND ERROR: Functional elements and generalized configuration of a measuring Instrument , Characteristics of Instruments, errors in measurements and their stastical analysis.
MEASUREMENT OF RESISTANCE :Wheatstone bridge, Carey-Foster bridge, Kelvin double bridge, Measurement of Insulation resistance.

UNIT-II:
A.C. BRIDGES:Maxwell Inductance bridge, Maxwell Inductance Capacitance bridge, Anderson, Hay, De-Sauty, Schering and Weins bridge.
VOLTAGE INDICATING AND RECORDING DEVICES : Analog voltmeters and Potentiometers, Self balancing Potentiometers and X-Y recorders, Galvanometer – Oscillographs, Cathode – Ray Oscilloscopes, Magnetic Tape Recorders.

UNIT-III:
ELECTRONIC INSTRUMENTS:Wave analyser, Distortion meter, Q-meter, measurement of Op-Amp parameters.
DIGITAL INSTRUMENTS : Digital Indicating Instruments, Comparison with anlaog type, digital display methods, digital methods of time and frequency measurements, digital voltmeters.

UNIT-IV:
TRANSDUCERS: Classification of Transducers, Strain Gauge, Displacement Transducers – Capacitive transducers , LVDT, Piezo-electric Transducers, Temperature Transducers – resistance thermometer, thermocouples and thermistors, Liquid level measurement, Low pressure (vacuum) measurement.
DATA ACQUISITION SYSTEMS : A to D and D to A converters ,Analog and Digital Data Acquisition Systems, Multiplexing, Spatial Encoders, Telemetry.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. W.D.Cooper & A.D.Helfrick , Electronic Instrumentation and Measurement Techniques , PHI.
2. By A.K.Sawhney, A course in Electrical and Electronic Measurement and Instrumentation, Dhanpat Rai & Sons.
3. Ernest O.Doeblin, Measurement Systems: Application and Design, MC Graw Hill.

B.TECH Vth SEMESTER
CONTROL SYSTEMS
(ECT-208)

L	T	P
4	2	-

Theory : 100
Sessional : 50
Time :3Hrs

UNIT-I :
INTRODUCTION: The control system: servomechanism, historical development of automatic control system, sampled data digital control system, multivariable control systems.
MATHEMATICAL MODELS OF PHYSICAL SYSTEMS: Differential equation of physical systems, transfer function, block diagram algebra, signal flow-graphs.
FEEDBACK CHARACTERISTICS OF CONTROL SYSTEMS: Feedback and non-feedback systems, reduction of parameter variations by use of feedback, Control over system dynamics by use of feedback, control of the effect of disturbance signal by use of feedback.

UNIT-II:
CONTROL SYSTEM AND COMPONENTS: Linear approximation of non-linear systems, electrical systems, stepper Motor.
TIME RESPONSE ANALYSIS: Standard test signals, time response of first order and second order systems, steady-state errors and error constants, design specification of second-order-systems.
STABILITY:The concept of stability ,necessary conditions for stability, Hurwitz stability criterion, Routh stability criterion, Relative stability analysis.
THE ROOT LOCUS TECHNIQUE:The Root locus concept, construction of root loci, root contours.

UNIT-III:
FREQUENCY RESPONSE ANALYSIS: Correlation between time and frequency response, Polar Plots, Bode Plots, experimental determination of transfer function.
STABILITY IN FREQUENCY DOMAIN: Nyquist stability criterion, relative stability using Nyquist Criterion, closed-loop frequency response.

UNIT-IV:
INTRODUCTION TO DESIGN: Considerations of classical design, realization of basic compensators, cascade compensation in time domain, cascade compensation in frequency domain, feedback compensation.
STATE VARIABLE ANALYSIS : Concept of state,state variable and state model, state models for linear continuous time systems, diagonalization solution of state equations, concept of controllability and observability, pole placement by state feedback.

NOTE :

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. I.J.Nagrath and M.Gopal, Control Systems Engineering.
2. B.C.Kuo, Automatic Control Systems.

B.TECH IVth SEMESTER
ELECTRONICS CIRCUIT SIMULATION (Pr)
(ECT-210)

L	T	P
-	-	4

Exam : 50
Sessional : 75
Time : 3Hrs

LIST OF EXPERIMENTS: -

1. Familiarization with the EDA Tool.
2. Learning to capture schematic and use simulation commands.
3. Simulation of digital gates and flip-flop.
4. Simulation of a Class-A amplifier.
5. Design and Simulation of a 2-digit BCD adder/subtractor.
6. Design and Simulation of op-amp based square-wave generator.
7. Design and Simulation of op-amp based phase shift oscillator.
8. Design and Simulation of op-amp based low pass, high pass and Band pass filters.
9. Design and Simulation of 2-stage, Class-A amplifier.
10. Design and Simulation of 4 -bit carry took ahead adder.
11. Design and Simulation of 555 astable and mono-stable multivibrators.
12. Study of effect of no. of inputs on switching response of CMOS gates.
13. Design and Simulation of clock generator circuit.
14. Design and Simulation of 2-bit dynamic RAM.

B.TECH IV SEMESTER
COMMUNICATION - I (Pr.)
(ECT-212)

L	T	P	
-	-	3	

Sessional : 50
Viva : 50
Time : 3 Hrs

LIST OF EXPERIMENTS: -

1. Study of AM (Modulation/Demodulation).
2. Study of FM (Modulation/Demodulation).
3. Study of PAM (Modulation/Demodulation).
4. Study of PWM (Modulation/Demodulation).
5. Study of PPM (Modulation/ Demodulation).
6. Study of PCM (Modulation/Demodulation).
7. Study of DM (Modulation/Demodulation).
8. Study of ADM (Modulation/Demodulation).
9. Sensitivity of a superhet Receiver.
10. Selectivity of a superhet Receiver
11. Fidelity of a superhet Receiver.

B.TECH VIth SEMESTER
ANTENNA AND WAVE PROPAGATION
(ECT-301)

L	T	P	Theory	: 75
3	1	-	Sessional	: 50
			Time	: 3Hrs

UNIT – I:
BASIC PRINCIPLES AND DEFINITIONS: Retarded vector and scalar potentials. Radiation and induction fields. Radiation from elementary dipole (Hertzian dipole, short dipole, Linear current distribution), half wave dipole, Antenna parameters : Radiation resistance, Radiation pattern, Beam width, Gain, Directivity, Effective height, Effective aperture, Polarization, Bandwidth and Antenna Temperature.

UNIT – II:
RADIATING WIRE STRUCTURES AND ANTENNA ARRAYS: Folded dipole , Monopole, Biconical Antenna, Loop Antenna, Helical Antenna. Principle of pattern multiplication, Broadside arrays, Endfire arrays, Array pattern synthesis, Uniform Array, Binomial Array, Chebyshev Array, Antennas for receiving and transmitting TV Signals e.g. Yagi-Uda and Turnstile Antennas. Printed antennas.

UNIT – III:
APERTURE TYPE ANTENNAS: Radiation from rectangular aperture, E-plane Horns, H-plane Horns, Pyramidal Horn, Lens Antenna, Reflector Antennas and Slot Antennas.
BROADBAND AND FREQUENCY INDEPENDENT ANTENNAS : Broadband Antennas. The frequency independent concept : Rumsey's principle, Frequency independent planar log spiral antenna, Frequency independent conical spiral antenna and Log periodic antenna.

UNIT – IV:
PROPAGATION OF RADIO WAVES : Different modes of propagation, Ground waves, Space waves, Surface waves and Tropospheric waves, Ionosphere, Wave propagation in the ionosphere, critical frequency, Maximum Usable Frequency (MUF), Skip distance, Virtual height, Radio noise of terrestrial and extra terrestrial origin. Multipath fading of radio waves.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Robert E.Collin, Antenna & Wave Propagation, McGraw Hill
2. John D. Kraus, Antennas, McGraw Hill.
3. E.C.Jordan and K.G.Balmain, Electromagnetic Waves and Radiating Systems, PHI

B.TECH Vth SEMESTER
COMPUTER ARCHITECTURE AND ORGANIZATION
(ECT-303)

L	T	P	
3	2	-	

Theory : 75
Sessional : 50
Time :3Hrs

UNIT-I:
BASIC STRUCTURE OF COMPUTER HARDWARE AND SOFTWARE :
Functional Units, historical Perspective, Register transfer and micro-operations. Information representation, Instruction format, Instruction types, Addressing modes, Machine and Assembly Language programming, Macros and Subroutines.

UNIT-II:
PROCESSOR DESIGN: Fixed – point and floating-point arithmetic addition, subtraction, Multiplication and division, Decimal arithmetic unit – BCD adder, BCD subtraction, decimal arithmetic operations, ALU design, Forms of Parallel processing classification of Parallel structures, Array Processors, Structure of general purpose Multiprocessors.
CONTROL DESIGN:
Hardwired Control: design methods, Multiplier Control Unit, CPU Control unit, Microprogrammed Control: basic concepts, Multiplier Control Unit, Microprogrammed Computers, CPU Control unit.

UNIT-III:
MEMORY ORGANIZATION: Memory device characteristics, Random access memories: semiconductor RAMS, Serial – access Memories – Memory organization, Magnetic disk memories, Magnetic tape memories, Optical memories, Virtual memory, Main Memory Allocation, Interleaved memory, Cache Memory, Associative Memory.

UNIT-IV:
SYSTEM ORGANIZATION: Input-Output Systems – Programmed IO, DMA and Interrupts, IO Processors, Interconnection networks – single bus, crossbar networks, multistage networks, hypercube networks, mesh networks, Tree networks, ring networks, Pipelining – basic concept.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. J.P.Hayes, Computer Architecture and Organization, Mc Graw Hill.
2. M.M. Mano , Computer System Architecture, PHI.
3. V.C.Hamacher, Z.G.Vianesic & S.G.Zaky, Computer Organization , Mc-Graw Hill.

B.TECH V SEMESTER
INFORMATION THEORY AND CODING
(ECT-305)

L	T	P
3	2	-

Theory	: 75
Sessional	: 50
Time	: 3 hrs

UNIT – I:
PROBABILITY AND RANDOM PROCESSES : Probability, random variables, Probability distribution and density functions, Joint Statistics, Conditional Statistics, independence, Functions of random variables & random vectors, Expectation, moments, Characteristic Functions, Convergence of a sequence of random variables, Laws of large numbers, Central Limit Theorem, Random Processes, mean and Auto Correlation, Stationary ergodicity, Power Spectral density, Response of memory- less and linear systems, Gaussian Poisson, Markov processes.

UNIT – II:
ELEMENTS OF INFORMATION THEORY AND SOURCE CODING: Introduction, information as a measure of uncertainty, Entropy, its properties, Discrete memoryless channels, Mutual information, its properties, BSC, BEC. Channel capacity, Shanon's theorem on coding for memoryless noisy channels.
Separable binary codes, Shanon–Fano encoding, Noiseless coding, Theorem of decodability, Average length of encoded message, Shanon's binary encoding, Fundamental theorem of discrete noiseless coding, Huffman's minimum redundancy codes.

UNIT – III:
LINEAR BLOCK CODES: Introduction to error control coding, Types of codes, Maximum Likelihood decoding, Types of errors and error control strategies, Galois fields, Linear block codes, Error detecting and correcting capabilities of a block code, Hamming code, cyclic code, B.C.H. codes.

UNIT – IV:
CONVOLUTIONAL CODES AND ARQ: Transfer function of a convolutional code, Syndrom decoding, Majority logic decodable codes, Viterbi decoding, distance properties of binary convolutional codes, Burst error correcting convolutional codes, general description of basic ARQ strategies, Hybrid ARQ schemes.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Papoulis, A. Probability, Random Variables and Stochastic Processes, MGH.
2. Gray, R.M. Davission,L.D,Introduction to Statistical Signal Processing-
   Web Edition-1999.
3. F. M. Reza, Information Theory, McGraw Hill.
4. Das, Mullick and Chatterjee, Digital Communication, Wiley Eastern Ltd.
5. Shu Lin and J. Costello, Error Control Coding, Prentice Hall.
6. B. R. Bhat, Modern Probability Theory, New Age International Ltd.

B.TECH Vth SEMESTER
LINEAR IC APPLICATIONS
(ECT-307)

L	T	P		
3	2	-	Theory	: 75
			Sessional	: 50
			Time	:3Hrs

UNIT-I:
DIFFERENTIAL AND CASCADE AMPLIFIERS: Balanced, unbalanced output differential amplifiers, FET differential amplifier, current mirrors, level Translators, cascade configuration of amplifiers, operational amplifiers, Introduction to ideal OP-AMP, characteristic parameters, Interpretation of data sheets, Practical OP-AMP, its equivalent circuit and op-amp circuit configurations.

UNIT-II:
OP-AMP WITH NEGATIVES FEEDBACK AND FREQUENCY RESPONSE: Block diagram representation of feedback amplifier, voltage series feedback, voltage shunt feedback differential amplifiers, frequency response compensating network, frequency response of internally compensative op-amp and non compensating op-amp. High frequency op-amp equivalent circuit, open loop gain Vs frequency, closed loop frequency response, circuit stability, slow rate.

UNIT-III:
OP-AMP APPLICATION: DC, AC amplifiers, peaking amplifier, summing, sealing, averaging and instrumentation amplifier, differential input output amplifier, voltage to current converter, current to voltage converter, very high input impedance circuit, integration and differential circuit, wave shaping circuit, active filters, oscillators

UNIT-IV:
SPECIALIZED LINER IC APPLICATIONS: Universal active filter, switched capacitor filter, 555 timer, PLL, power amplifier, 8038 IC, ICs used in radio receiver.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. R.A. Gayakwaed , OP-amps and Linear Integrated circuits .
2. K.R.Botkar , Integrated circuits.

B.TECH Vth SEMESTER
MICRO-ELECTRONICS
(ECT-309)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time :3Hrs

UNIT-I:
Crystal Growth: MGS, EGS, Czochralspi crystal Puller, Silicon shaping, Wafer Preparation.
Epitaxy: Vapour Phase Epitaxy, Epitaxial Layer evaluation, Molecular Beam Epitaxy.
Oxidation: Thermal Oxidation Kinetics, Oxidation Techniques, Oxide Properties, Oxidation induced Defects. LithoGraphy: Photolithography, E-beam lithography, X-ray Lithography.

UNIT-II:
Reactive Plasma Etching: Plasma Properties, Feature Size control and anisotropic etching, Plasma etching techniques and equipment. Di-electric and Poly-Silicon Film Deposition : Deposition Processes for Poly- Si, SiO2, SiO3N4; Plasma assisted Depositions.

UNIT-III:
Diffusion : A Qualitative view of atomic diffusion in Solids, diffusion mechanisms, Fick's one dimensional diffusion equation, constant source and limited source diffusion, Diffusion of Grp3 and 5 impurities in Silicon Impurity Sources, diffusion apparatus, Characterization of diffused layers.
Ion Implantation: Introduction, Range Theory, Implantation Equipment Annealing.

UNIT-IV:
Metallization : Metallization applications, Choices, Physical Vapour Deposition. Sputtering, Metallization Problems. Assembly & Packaging: Package Types, design considerations, Package fabrication technologies, Future trends.
Isolation Techniques.Bipolar IC fabrication Process Sequence. N-MOS IC fabrication Process Sequence.

NOTE:
1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. S.M.Sze, VLSI Technology, Mc Graw Hill.
2. S.K.Ghandhi, VLSI Fabrication Principles.

B.TECH Vth SEMESTER
MICROPROCESSORS
(ECT-311)

L	T	P	
3	2	-	

Theory : 75
Sessional : 50
Time :3Hrs

UNIT-I:
INTRODUCTION : Evolution of microprocessors, technological trends in microprocessor development. The Intel family tree. CISC Versus RISC. Applications of Microprocessors.
8086 CPU ARCHITECTURE : 8086 Block diagram; description of data registers, address registers; pointer and index registers, PSW, Queue, BIU and EU. 8086 Pin diagram descriptions. Generating 8086 CLK and reset signals using 8284. WAIT state generation. Microprocessor BUS types and buffering techniques, 8086 minimum mode and maximum mode CPU module.

UNIT-II:
8086 INSTRUCTION SET : Instruction formats, addressing modes, Data transfer instructions, string instructions, logical instructions, arithmetic instructions, transfer of control instructions; process control instructions; Assembler directives.
8086 PROGRAMMING TECHNIQUES : Writing assembly Language programs for logical processing, arithmetic processing, timing delays; loops, data conversions. Writing procedures; Data tables, modular programming. Macros.

UNIT-III:
MAIN MEMORY SYSTEM DESIGN : Memory devices, 8086 CPU Read/Write timing diagrams in minimum mode and maximum mode. Address decoding techniques. Interfacing SRAMS; ROMS/PROMS. Interfacing and refreshing DRAMS. DRAM Controller – TMS4500.

UNIT-IV:
BASIC I/O INTERFACE : Parallel and Serial I/O Port design and address decoding. Memory mapped I/O Vs Isolated I/O Intel's 8255 and 8251- description and interfacing with 8086. ADCs and DACs, - types, operation and interfacing with 8086. Interfacing Keyboards, alphanumeric displays, multiplexed displays, and high power devices with 8086.
INTERRRUPTS AND DMA : Interrupt driven I/O. 8086 Interrupt mechanism; interrupt types and interrupt vector table. Intel's 8259. DMA operation. Intel's 8237. Microcomputer video displays.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. D.V.Hall , Microprocessors and Interfacing , McGraw Hill 2nd ed.
2. J Uffenbeck , The 8086/8088 family , (PHI).
3. Liu,Gibson , Microcomputer Systems – The 8086/8088 family, (2nd Ed-PHI).

B.TECH Vth SEMESTER
COMMUNICATION-II(Pr.)
(ECT – 313)

L	T	P	Sessional : 50
-	-	2	Viva : 25
			Time : 3 Hrs.

LIST OF EXPERIMENTS :-

1. Study of Low Pass/High Pass/ Band Pass Filter Using Active & Passive Elements.
2. To Study Pulse Position Modulation & Demodulation.
3. To Study Pulse Amplitude Modulation & Demodulation.
4. To Study Pulse Width Modulation & Demodulation.
5. To Study Amplitude Modulation & Demodulation
6. To Study Frequency Modulation & Demodulation
7. To Study Sampling Theorem
8. To Study Diode detector & AGC
9. To Study fidelity Characteristics of super heterodyne receiver.
10. To Study Selectivity Characteristics of super heterodyne receiver.

B.TECH Vth SEMESTER
MICROPROCESSORS (Pr.)
(ECT-315)

L	T	P	Exam	: 25
-	-	3	Sessional	: 50
			Time	:3Hrs

Before starting with the experiments, teacher should make the students conversant with the following essential theoretical concepts.

A. i) Programming Model of Intel's 8086.
ii) Addressing Modes of Intel's 8086.
iii) Instruction formats of Intel's 8086

B. Instruction set of Intel's 8086.
C. Assembler , and Debugger.

LIST OF EXPERIMENTS:

I a) Familiarization with 8086 Trainer Kit.
b) Familiarization with Digital I/O, ADC and DAC Cards.
c) Familiarization with Turbo Assembler and Debugger S/Ws.

II Write a program to arrange block of data in
i) ascending and (ii) descending order.

III Write a program to find out any power of a number such that $Z = X^N$.
Where N is programmable and X is unsigned number.

IV Write a program to generate.
i) Sine Waveform (ii) Ramp Waveform (iii) Triangular Waveform Using DAC Card.

V Write a program to measure frequency/Time period of the following functions.
(i) Sine Waveform (ii) Square Waveform (iii) Triangular Waveform
using ADC Card.

VI Write a program to increase, decrease the speed of a stepper motor and reverse its direction of rotation using stepper motor controller card.

VII write a programmable delay routine to cause a minimum delay = 2MS and a maximum delay = 20 minutes in the increments of 2 MS

VIII a) Use DOS interrupt to read keyboard string/character.
b) Use BIOS interrupt to send a string/character to printer.

IX Write a program to :
i) Create disk file.
ii) Open, write to and close- a disk file.
iii) Open, read from and close a disk file.
iv) Reading data stamp of a file using BIOS interrupt.

X i) Erasing UVPROMs and EEPROMs
ii) Reprogramming PROMs using computer compatible EPROM Programmer.

XI Studying and Using 8086 In-Circuit Emulator.

B.TECH VI1 SEMESTER
MICROWAVE ENGINEERING
(ECT-302)

L	T	P
3	2	-

Theory : 75
Sessional. : 50
Time : 3 Hrs

UNIT – I:
MICROWAVE GENERATORS: Construction, characteristics, operating principle and typical applications of Klystron, Reflex Klystron, magnetron and Traveling Wave Tube

UNIT – II:
SOLID STATE MICROWAVE DEVICES: Parametric amplifiers, GUNN effectDevices, IMPATT, TRAPATT, BARITT diodes
MICROWAVE RESONATORS: rectangular, cylindrical, spherical and coaxial resonators, excitation and coupling of cavities.

UNIT – III:
MATRIX DESCRIPTION OF MICROWAVE CIRCUITS: Scattering matrix-its properties, measurement of scattering coefficients, scattering matrices for common microwave systems.

UNIT – IV:
MICROWAVE COMPONENTS: Waveguide tees- E-plane, H-plane, magic tee, rat race, directional coupler, tuning screws and stubs, isolators and circulators-their constructional features, and applications. Microwave filters, Phase shifters, attenuators, Wavemeters.
MICROWAVE MEASUREMENTS: Measurement of frequency, impedance (using slotted section) attenuation, power, dielectric constant, measurement of V.S. W. R., insertion loss and permeability.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Samuel Y. Liao, Microwave Devices and Circuits, Prentice-Hall of India.
2. David M. Pozar, Microwave Engineering, John Wiley and sons Inc.
3. Das, Annapurna & Sisir K. Das, Microwave Engineering, Tata McGraw-Hill.

B.TECH V1th SEMESTER
VHDL AND DIGITAL DESIGN
(ECT-304)

L	T	P
3	1	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT I:
INTRODUCTION: History. Why use VHDL ? Hardware design construction, design levels, HDLs Hardware simulation and synthesis. Using VHDL for design synthesis, terminology.
PROGRAMMABLE LOGIC DEVICES :Why use programmable logic ? What is a programmable logic device ? Block diagram, macrocell structures and characteristics of PLDs and CPLDs. Architecture and features of FPGAs. Future direction of programmable logic.

UNIT II:
BEHAVIORAL MODELING:Entity declaration, architecture body, process statement, variable assignment, signal assignment. Wait, If, Case, Null, Loop, Exit, Next and Assertion statements. Inertial and transport delays, Simulation deltas, Signal drivers.
DATA FLOW AND STRUCTURAL MODELLING:Concurrent signal assignment, sequential signal assignment, Multiple drivers, conditional signal assignment, selected signal assignment, block statements, concurrent assertion statement, component declaration, component instantiation.

UNIT III:
GENERICS AND CONFIGURATIONS :Genericcs, Why configurations ?, default configurations, component configurations. Genericcs in configuration. Generic value specification in architecture, block configurations, architecture configurations.
SUBPROGRAMS AND PACKAGES :Subprograms – functions, procedures, declarations. Package declarations, package body, use clause, predefinal package standard. Design libraries, design file.

UNIT IV:
ADVANCED TOPICS :Generate Statements, Aliases, Qualified expressions, Type conversions, Guarded signals, User defined attributes, Predefined attributes., VHDL synthesis.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES :

1. D. Perry , VHDL, 3rd Ed.- TMH.
2. J.Bhasker, A.VHDL- Primer, PHI.
3. Skahil, VHDL for Programmable logic- 2nd Ed – Wiley.

B.TECH V1 SEMESTER
DIGITAL SIGNAL PROCESSING
(ECT- 306)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT – I:
DISCRETE TRANSFORMS: Z- transform and its properties, poles and zeros, Inversion of Z-transform, One sided Z-transform and solution of differential equations. Analysis of LTI systems in Z-domain, causality, stability, schur-cohn stability test; relationship between Z-transform and Fourier transform. Frequency selective filters; all pass filters, minimum-phase, maximum-phase and mixed-phase systems. Schur-cohn. Fuji ware and Jury Marder stability criterion.
Frequency domain sampling and DFT; properties of DFT, Linear filtering using DFT, Frequency analysis of signals using DFT, radix 2, radix-4 and split radix FFT algorithms, goertzel algorithm, Chirp Z-transform, applications of FFT algorithm, computation of DFT of real sequences. Quantization effects in computation of DFT.

UNIT – II:
IMPLEMENTATION OF DISCRETE TIME SYSTEMS: Direct form, cascade form, frequency sampling and lattice structures for FIR systems. Direct forms, transposed form, cascade form parallel form. Lattice and lattice ladder structures for IIR systems. State space structures Quantization of filter co-efficient structures for all pass filters.

UNIT – III:
DESIGN OF FIR FILTERS: Characteristics of practical frequency selective filters. Filters design specifications peak pass band ripple, minimum stop band attenuation. Four types of FIR filters Design of FIR filters using windows. Kaiser window method comparison of design methods for FIR filters Gibbs phenomenon, design of FIR filters by frequency sampling method, design of optimum equiripple FIR filters, alternation theorem.

UNIT – IV:
DESIGN OF IIR FILTERS: Design of IIR filters from analog filters, Design by approximation of derivatives, Impulse invariance method bilinear transformation method characteristics of Butterworth, Chebyshev, and Elliptical analog filters and design of IIR filters, Frequency transformation, least square methods, design of IIR filters in frequency domain.

NOTE:
1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. John G. Proakis, Digital Signal Processing, PHI
2. S. K. Mitra, Digital Signal Processing , TMH
3. Rabiner and Gold, Digital Signal Processing, PHI
4. Salivahan, Digital Signal Processing , TMH

B. TECH. VI SEMESTER
DIGITAL COMMUNICATION
(ECT-308)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT – I:
PULSE MODULATION: sampling process, PAM and TDM; aperture effect. PPM noise in PPM, channel Bandwidth, Recovery of PAM and PPM signals Quantization process, quantization noise, PCM, μ Law and A- law compressors. Encoding, Noise in PCM, DM, delta sigma modulator, DPCM, ADM.

UNIT – II:
BASE BAND PULSE TRANSMISSION: Matched filter and its properties average probability of symbol error in binary enclosed PCM receiver, Intersymbol interference, Nyquist criterion for distortionless base band binary transmission, ideal Nyquist channel raised cosine spectrum, correlative level coding Duo binary signalling, tapped delay line equalization, adaptive equalization, LMS algorithm, Eye pattern.

UNIT – III:
DIGITAL PASS BAND TRANSMISSION: Pass band transmission model; gram Schmidt orthogonalization procedure, geometric Interpretation of signals, Response of bank of correlaters to noise input, detection of known signal in noise, Hierarchy of digital modulation techniques, BPSK, DPSK, DEPSK, QPSK, systems; ASK, FSK, QASK, Many FSK, MSK, Many QAM, Signal space diagram and spectra of the above systems, effect of intersymbol interference, bit symbol error probabilities, synchronization.

UNIT – IV:
SPREAD SPECTRUM MODULATION: Pseudonoise sequence, A notion of spread spectrum, direct sequence spread spectrum with coherent BPSK, signal space dimensionality & processing gain, probability of error, frequency spread spectrum, CDM.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. John G. Proakis, Digital Communication, PHI
2. Taub & Schilling, Principles of Communication, TMH
3. Simon Haykin, Communication systems, John Wiley & Sons

B.TECH V1 SEMESTER
COMPUTER COMMUNICATION NETWORKS
(ECT-310)

L	T	P	
3	1	-	Theory : 75 Sessional : 50 Time : 3Hrs

.

UNIT – I:
INTRODUCTION: Uses of Computer Networks, Network Hardware, Network Software, Reference models, Examples of Networks & Data communication Services, Network Standardization.
THE PHYSICAL LAYER: The Theoretical basis for Data communication, Transmission media, Wireless Communication, The Telephone System, Narrowband ISDN, Broadband ISDN and ATM, Cellular Radio, Communication Satellites.

UNIT – II:
THE DATA LINK LAYER: Data Link Layer Design issues, Error Detection & correction, Elementary Data Link protocols, Sliding Window Protocols, Protocol Specification & Verification, Example of Data Link Protocols.
THE MEDIUM ACCESS SUBLAYER: Aloha Protocols, LAN Protocols, IEEE Standards, Fiber optic Networks, Satellite Networks, Packet radio Networks.

UNIT – III:
NETWORK LAYER: Design issues, routing algorithms, congestion control Algorithms, internetworking.
TRANSPORT & SESSION LAYER: Protocol design issues, connection Management, remote procedure calls.

UNIT – IV:
PRESENTATION LAYER: Design issues, abstract Syntax notation, data compression technique, cryptograph.
APPLICATION LAYER: Design issues, file transfer, access and management, electronic mail, virtual terminals, applications and examples.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES :

1. Tanenbaum A.S, Computer Networks, PHI.
2. Forouzan B.A, Data Communications and Networking, Tata-Mc-Graw Hill.
3. Stallings W, Data and Computer Communications, PHI.
4. Ahuja V, Design and Analysis of Computer Communication, McGraw Hill.
5. Bee K.C.S, Local Area Networks, NCC Pub.
6. Davies D. W. Barber, Computer Networks and their Protocols, John Wiley.

B.TECH IV SEMESTER
DIGITAL COMMUNICATION (Pr)
(ECT-312)

L	T	P
-	-	2

Sessional : 50
Viva : 25
Time : 3Hrs

LIST OF EXPERIMENTS:

1. To Study PSK
2. To Study FSK
3. To Study IF Amplifier
4. To Study Balanced Modulator & Demodulator
5. To Study PCM
6. Setting up a Fiber Optic Analog Link
7. Setting up a Fiber Optic Digital Link
8. Losses in Optical Fiber
9. Measurement of Numerical Aperture
10. Time Division multiplexing of signals.

B.TECH V1th SEMESTER
ELECTRONICS DESIGN (Pr)
(ECT-314)

L	T	P
-	-	3

Exam : 25
Sessional : 50
Time : 3Hrs

LIST OF EXPERIMENTS:

1. Design a single stage R C Coupled amplifier and plot its gain frequency response.
2. Design a two stage R C Coupled amplifier and plot its gain frequency response.
3. Design a R C Phase shift oscillator using IC 741.
4. Design a wein bridge oscillator.
5. Design a square wave generator using IC 555.
6. Design a 4 : 1 multiplexer and 1 : 4 demultiplexer using logic gates.
7. Design a parallel parity bit generator using ICs.
8. Design a digital to analog converter using ICs.
9. Design a digital frequency meter (0-999HZ) using IC 555 for monoshot, IC-7404,7408,7490,7447.
10. Design a controller such that LEDs glow in pairs sequentially using IC 7490 and LEDs.

B.TECH V1th SEMESTER
VHDL (Pr.)
(ECT-316)

L	T	P
-	-	2

Exam : 25
Sessional : 50
Time :3Hrs

LIST OF EXPERIMENTS:

1. Write a VHDL Program to implement a 3 :8 decoder.
2. Write a VHDL Program to implement a 8:1 multiplexer using behavioral modeling.
3. Write a VHDL Program to implement a 1 :8 demultiplexer using behavioral modeling.
4. Write a VHDL Program to implement 4 bit addition/subtraction.
5. Write a VHDL Program to implement 4 bit comparator.
6. Write a VHDL Program to generate Mod- 10 up counter.
7. Write a VHDL Program to generate the 1010 sequence detector. The overlapping patterns are allowed.
8. Write a program to perform serial to parallel transfer of 4 bit binary number.
9. Write a program to perform parallel to serial transfer of 4 bit binary number.
10. Write a program to design a 2 bit ALU containing 4 arithmetic & 4 logic operations.

B.TECH VIIth SEMESTER
PHYSICAL DESIGN OF DIGITAL IC's.
(ECT-403)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT 1 :
NMOs & CMOS Fabrication Process Sequence, Basic electrical properties of NMOs & CMOS inverters, MOS Design Process : Stick Diagram & Design rules.

UNIT 2 :
Delay in MOS Circuits, Scaling of MOS Circuits, Some design examples, inverter, NAND gates, Multiplexer, Logic Function Block.
Introduction to physical design of IC's Layout rules & circuit abstractor, Cell generation, Layout environments, Layout methodologies, Packaging, Computational Complexity, Algorithmic Paradigms.

UNIT 3:
Placement : Partitioning, Floorplanning, Placement.
Routing : Fundamentals, Global Routing, Detailed Routing, Routing in FPGA's.

UNIT-4:
Performance issues in Circuit Layout : Delay models, Timing Driven placement,TimingDrivenRouting,Via Minimization, Power Minimization, other issues.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES :

1. Pucknell DA & Eshraghian K, Basic VLSI Design, PHI.
2. Sanfarazdeh M. & Wong C.K , An Introduction to VLSI Physical Design,.Mc Graw Hill.

B.TECH VII SEMESTER
TELEVISION & RADAR ENGINEERING
(ECT-405)

L	T	P
3	1	-

Theory : 75
Sessionl. : 50
Time : 3 Hrs

UNIT – I:
INTRODUCTION :Elements of TV System, Analysis and Synthesis of TV Pictures, composite Video, VSB Signal transmission and channel BW.
CAMERA AND PICTURE TUBES : Working of the following tubes – Image Orthicon, Vidicon, Plumbicon, Silicon diode Array, Vidicon , Monochrome, Shadow mask, PIL and Trinitron.

UNIT – II:
MONOCHROME SIGNAL TRANSMISSION AND RECEPTION :Block diagram of Monochrome Signal Transmitter and Receiver, Explanation of different sections, Transmitting and receiving antennas.
ELEMENTS OF COLOUR TV :Introduction, compatibility considerations, Interleaving process, Three color theory, Chrominance Signal, composite color signal, comparison of NTSC, PAL and SECAM Systems.

UNIT – III:
ADVANCED TOPICS IN TV. ENGINEERING :Introduction, & working and block diagram of the Projector TV, 3D-TV, HDTV, Digital TV, Camcorders.

UNIT – IV:
RADAR SYSTEMS :Fundamentals, the Radar equations , MTI and Pulse Doppler Radar, Tracking Radar.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. AM Dhake, Monochrome and Colour TV, TMH.
2. R.R.Gulati, Colour TV.Engg. Wiley Eastern Ltd.
3. SP Bali, Colour TV theory & practice, TMH
4. Merrill I. Skolnik, Introducion to Radar Systems, TMH

B.TECH VII SEMESTER
OPTICAL COMMUNICATION
(ECT-407)

L	T	P
3	2	-

Theory :75
Sessional :50
Time :3 Hrs

UNIT – I:
INTRODUCTION : Propagation within the fiber, Numerical aperture of fiber, diffraction, step index and graded index fiber, Modes of propagation in the fiber, Single mode and multi mode fibers. Splices and connectors.

UNIT – II:
LOSSES IN OPTICAL FIBER : Rayleigh Scattering Losses, Absorption Losses, Leaky modes, mode coupling losses, Bending Losses, Combined Losses in the fiber.
DISPERSION EFFECT : Effect of dispersion on the pulse transmission Intermodal dispersion, Material dispersion, Wave guide dispersion, Total dispersion, Transmission rate.

UNIT – III:
LIGHT SOURCES : LEDS, Laser Action in semiconductor Lasers, Semiconductor Lasers for optical communication – Laser modes, Spectral Characteristics, Power Voltage Characteristics, Frequency response.
DETECTORS : P-I-N Photodiode, APD Noise Analysis in detectors, Coherent and non-coherent detection, The fiber-optic Communication System.

UNIT – IV:
OPTICAL NETWORKS: Optical coupler,space switches,linear divider-combiners,wavelength division multiplexer and demultiplexer,optical amplifier,optical link network-single hop ,multi-hop, hybrid and photonic networks.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. John Power, An Introduction to Fiber optic systems, McGraw Hill International.
2. John Gowar , Optical communication Systems.
3. R. Ramaswamy, Optical Networks, Narosa Publication

B.TECH VII SEMESTER
ELECTRONIC SWITCHING SYSTEMS
(ECT-409)

L	T	P
3	2	-

Theory : 75
Sessional. : 50
Time : 3 Hrs

UNIT – I:
INTRODUCTION: Statistical Bandwidth Sharing, Switching, network Configurations, Elements of switching systems, Electronic exchange, PBX.
TELEPHONE NETWORKS: Subscriber loop, Switching Hierarchy & Routing Transmission systems, Numbering Plan, Charging plan, Signaling techniques Common Channel Signaling.

UNIT – II:
ELECTRONIC SPACE DIVISION SWITCH: Stored Program Control (SPC): Centralized & Distributed SPC, Software Architecture, and n-stage networks.
TIME DIVISION SWITCHING: Space Switching, Time Switching, Time multiplexed space switching & Time Switching, n-stage combination switching.

UNIT – III:
TRAFFIC ENGINEERING: Traffic load, Grade of service, blocking Probability models of switching systems, Markov processes, Birth-Death processes, delay systems, Models for packetized sources (voice and video), models for traffic flow in packet networks.
CELLULAR MOBILE TELEPHONY: Analog Switch System for Cellular Mobile, Cellular digital switching, centralized & remote controlled small switching system.

UNIT – IV:
TELEPHONE NETWORK PROTOCOLS: Protocols stacks, Digital Transmission hierarchy, SONET/SDH Signaling system. Multi Media Communication over global telephone N/W Introduction to Datagram switches, ATM Switches.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCES:

1. Thiagarajan Viswanathan, Telecommunication Switching Systems & Networks, PHI
2. Hui, J.Y., Switching & Traffic Theory for integrated broadband networks.
3. Keshav, S., Engineering. Approach to Computer Networking, Addison Wesley.

B.TECH VII SEMESTER
DIGITAL SIGNAL PROCESSING (Pr)
(ECT-411)

L	T	P
-	-	3

Viva-voce :25
Sessional : 50
Time 3 hrs.

LIST OF EXPERIMENTS:

1. Define a function to compute DTFT of a finite length signal. Plot the magnitude and phase plots using subplots. Use this function to obtain DTFT of a 21 point triangular pulse over the domain $-10<n<10$. Plot the results over $-\pi<w<\pi$.

2. Verify the Symmetry, time shifting and modulating properties of DTFT with a rectangular pulse of length 21.

3. Study the aliasing effect by using a Sinusoidal Signal. Show the plots of continuous time Signal. Sampled Signal and reconstructed signals by using subplot.

4. Study different window functions available in signal processing toolbox and their controlling parameters.

5. Design a length – 23 Linear phase FIR Low pass filter with a band edge of $Wo = 0.3\pi$ using Rectangular, Bartlett. Hanning, Hamming and Blackman Windows. Plot the impulse response, amplitude response and zero locations of these filters.

6. Write M-File functions that implement the overlap-add and overlap-save methods of block convolution. Compare the number of floating point operations via flops of these functions with that of 'conv'.

7. Verify the properties of Discrete Fourier Transform (DFT).

8. Use the MATLAB Command 'Cheby1' to design a fifth-order high-pass chebyshev IIR filter with a sampling frequency of 2 Hz, a band edge of 0.7 Hz and a passband ripple of 1db Plot the magnitude and phase frequency responses. Also design this filter with command butter and compare.

9. Design an elliptic filter of seventh degree according to the specifications.
   Passband : $0> 20 \text{Log}_{10} |H(e^{jw})| > -0.1$ dB for $0<|w|<wp = 0.4\pi$
   Stopband : $20 \log_{10} |H(e^{jw})| < -40$ dB

by using [b,a] = ellip (7,0.1, 40,0.4). Using this filter, study the word length effect for Direct Structure, cascaded structure, Parallel and Lattice Structure.

10. Study of Pre-emphasis of speech signal.

11. Study of Digital Signal Processing Kit (TMS/ADSP)

12. Implementation of FIR/digital filter using DSP Kit.

B.TECH VIIth SEMESTER
MICROCONTROLLERS
(ECT-417)

L	T	P		
3	2	-	Theory	: 75
			Sessional	: 50
			Time	: 3Hrs

UNIT 1:
INTRODUCTION :Comparing Microprocessors and Microcontrollers. Technological trends in Microcontrollers development. Survey of microcontrollers- 4 bit, 8 bit, 16 bit, 32 bit microcontrollers. Applications of microcontrollers.

UNIT 2:
8051 ARCHITECTURE :Block diagram, pin. Diagram of 8051. Functional descriptions of internal units, registers, PSW, internal RAM, ROM, Stack, Oscillator and Clock. I/O Pins, Ports and Circuits Connecting external memory. Counters and timers. Serial data interrupt. Serial data transmission /reception and transmission modes. Timer flag interrupt. External interrupt, software generated interrupts. External memory and memory space decoding, expanding I/Os, memory mapped I/O Reset & CLK Circuits.

UNIT 3:
8051 INSTRUCTION SET AND PROGRAMMING :8051 Instruction syntax, addressing modes, Data transfer instructions, logical instructions, arithmetic instructions, Jump and Call instructions. Interrupts and interrupt handler subroutines. Writing assembly Language programs. Time delays. Pure S/W time delays. S/W polled timer. Pure H/W delay. Lookup tables. Serial data transmission using time delays and polling. Interrupt driven serial transmission and reception.

UNIT 4:
8051 APPLICATIONS: Interfacing Keyboards Programs for small keyboards and matrix keyboards. Interfacing multiplexed displays, numeric displays and LCD displays. Measuring frequency and pulse width. Interfacing ADCs & DACs. Hardware circuits for handling multiple interrupts. 8051 Serial data communication modes- Mode 0, Mode 1, Mode 2 and Mode 3.

NOTE:

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2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. K.J.Ayala, The 8051 Microcontroller – 2nd ed. Penram International.
2. Intel's manual on " Embedded Microcontrollers"

B.TECH VIIth SEMESTER
BIOMEDICAL SIGNAL PROCESSING
(ECT-419)

L	T	P
3	2	-

Theory : 75
Sessional. : 50
Time : 3 Hrs

UNIT-I :
Introduction: Importance of Computers in Signal Processing, Basic Electrocardiography ECG lead System, ECG Signal Characteristics, Signal Sampling. Signal conversion.
Digital Filters : Z- transform, elements of digital filters, Types of digital filters, Transfer function of a difference equation Z-plane pole-zero plot.
FIR Filters : Characteristics, Smoothing Filters, Notch Filters, Derivatives, Window Design, Frequency Sampling, Minimax Design.
IIR Filters : Generic Equations, One pole and two pole filters Integrators.

UNIT-II:
Integer Filters: Basic Design Concept, Low Pass, High Pass, Band Pass, Band reject filters, Effect of cascading of filters, fast operating design techniques.
Adaptive Filters : Principal noise canceller model, GO Hz. Adaptive Canceling, Applications.

UNIT-III:
Signal Averaging : Signal averaging as a digital filter, a typical averager, Software for signal averaging, limitations, Data Reduction Techniques – Turning Point Algorithm, AZTEC Algorithm, Fan Algorithm, Huffman Coding. Fourier Transform, Correlation, convolution, Power Spectrum Estimation.

UNIT-IV:
ECG QRS Detection: Power Spectrum of ECG, Band Pass Filtering Techniques, Differentiation Techniques, Template Matching, QRS Detection Algorithm.
ECG Analysis System : ECG Interpretation, ST Segment Analyzer, Portable Arrhythmia Monitor.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section.

REFERENCE:

1. WJ.Tompkin, Biomedical Signal Processing edition , PHI
2. JG Proakis, Digital Signal Processing , PHI
3. Salivahanan, Digital Signal Processing, Tata Mc-Graw Hill.

B.TECH VIIth SEMESTER
RELIABILITY
(ECT-421)

L	T	P		
3	2	-	Theory	: 75
			Sessional	: 50
			Time	: 3Hrs

UNIT 1:

INTRODUCTION: Definition of reliability, failure data analysis, mean failure ratio, MTTF, MTBF, graphical plot, MTTF in terms of failure density, generalization, reliability in terms of failure density (integral form), reliability in other situation.

HAZARD MODELS: Introduction, constant hazard linearly increasing hazard, Weibull model, on density function and distribution function, and reliability analysis, important distribution and its choice, expected value, standard deviation and variance, theorem concerning expectation and variance.

UNIT 2:

SYSTEM RELIABILITY: Introduction, series system with identical component, reliability bounds-classical approach Bayesian approach application of specification hazard models, an r-out-of-an structure methods for solving complex system, systems not reducible to mixed configuration, mean time to failure system, logic diagrams, Markov model and graph.

RELIBILITY IMPROVEMENT AND FAULT TREE ANALYSIS: Introduction, improvement by component, redundancy, element redundancy, unit redundancy, optimization, stand by redundancy, reliability-cost trade off, fault tree construction, calculation of reliability from fault tree.

UNIT 3:

MAINTAINABILITY, AVAILABITY AND REPAIRABLE SYSTEM:Introduction, maintainability, availability, system down time, reliability and maintainability trade off, instantaneous repair rate MTTR, reliability and availability function.

BAYESIAN APPROXIMATION AND RELIABITY ESTIMATION: Introduction, Lindley's expansion, reliability estimation, normal, Weibull, inverse gaussian and Rayleigh.

UNIT 4:

RELIABILITY ALLOCATION AND APPLICATION: Reliability allocation for a series system, approximation of reliability in a computer system and nuclear power plant, failure models and effects analysis (FMEA)

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. S.K.Sinha, Reliability and life testing, (WEL New Delhi).
2. L.A.Srinath, Reliability engineering, (EWP New Delhi).
3. Bal Guru Swami, Quality control and Reliability, (Khanna publisher New Delhi).

B.TECH VIIth SEMESTER
ADVANCED MICROPROCESSORS
(ECT-423)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT-I

INTEL'S X86 FAMILY :Introduction, Register set, data formats, addressing modes, interrupts, memory hierarchy, pipelining, segmentation, paging, real and virtual mode execution, protection mechanism, task management.

UNIT-II

ARCHITECTURE OF INTEL X86 FAMILY : CPU block diagrams, Pin diagrams and internal descriptions of -80286,386,486 and Pentium. Instruction formats. Intel X86 Instruction set. Assembler directives.

UNIT-III

ARITHMETIC CO-PROCESSORS : Data formats; 80287 architecture – Pin diagram, internal architecture, status register, control register; tag register. Instruction set – data transfer, arithmetic, omparison, transcendental operations, constant operations and control instructions. Interfacing 80287 with 80286 Programming examples.

UNIT-IV

HIGHER- CO-PROCESSORS :Introduction to 80387,80487.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Daniel Tabak, Advanced Microprocessors (2nd ed) Mc Graw Hill Pub.
2. Barry B.Brey, The Intel Microprocessors (4th ed) PHI Pub.
3. DV-Hall , Microprocessors & Interfacing (2nd ed) Mc Graw Hill Pub.

B.TECH VIIth SEMESTER
INDUSTRIAL ELECTRONICS
(ECT-425)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3Hrs

UNIT-I

THYRISTOR FAMILY: V-I Characteristics of a Thyristor (SCR), Thyristor ratings, Thyristor construction, Thyristor turn on methods, Dynamic characteristics of SCR, Thyristor turn-off methods, classification of forced turn-off methods. THYRISTOR A.C. PHASE CONTROL: Line commutated converter, angle phase and three phase rectifier circuit, Thyristor protector over voltage and over current. HEAT SINK CALCULATION AND COOLING OF THYRISTOR: Heat transfer consideration, thermal resistance for heat sinks, specialized requirement for cooling,

UNIT-II

CYCLOCONVERTER: Cycloconverter and frequency multiplier; dual convertor, Cycloconverter triggering circuit, frequency multiplier, chopper circuit and their performance; type and choice of chopper circuits.
INVERTER: Requirement of inverters, Thyristor ratings for inverters, transistor inverters, trigger circuits for Thyristor convertor, single phase bridge convertor, some simple for phase control.

UNIT-III

TRIAC CHARACTERISTICS: Choice between TRIAC and SCR, trigger device for TRIAC, TRIAC applications.
CONVERTER CONTROL USING MICROPROCESSOR:Microprocessor architecture, digital controller, microcomputer control of a drive, series and parallel connection of diodes and Thyristor, triggering of series and parallel connected thyristors.
PRINCIPLE OF INDUCTION HEATING: Merits and applications, dielectric heating, methods of coupling to the R.F. generator, Applications.

UNIT-IV

ULTRASONIC: Introduction, generation of ultrasonic waves, electron acoustics method of visualization biological effect ultrasonic, soldering and welding by ultrasonics.
PROGRAMMABLE CONTROLLER: Programmable logic controller, basic parts of programmable panel, features, classification and operation of programmable controller, circuits for input and output module.
PHOTOELECTRONICS: Application of photoelectric control, industrial photoelectric device, electronic circuit for photoelectric switch, optoelectronics devices, application of optocoupler, special types of optocoupler

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. M.S. Berde , Thyristor Engineering, (Khanna publisher, New Delhi).
2. G.K.Mithal , Industrial electronics, (Khanna publisher, New Delhi).
3. Thomas E. Kissell, Industrial electronics, (PHI-New Jersy).

B.TECH VIIth SEMESTER
ANALOG MOS IC DESIGN
(ECT-427)

L	T	P	
3	2	-	Theory : 75
			Sessional : 50
			Time : 3Hrs

UNIT 1:
MOS/CMOS PROCESSOR TECHNOLOGY : General consideration, Wafer processing, photolithography, Oxidation, Ion implantation, Deposition & Etching, Device Fabrication, Active & Passive devices, Interconnects, Latch-up

UNIT 2:
INTRODUCTION TO ANALOG DESIGN:Analog integrated & MOSFET/CMOS,levels of abstraction, robust analog design, MOSFET as a switch, MOSFET structure, derivation of I/V. characteristics, second order effects MOS design lay out, MOS device capacitance & small signal model, N-MOS P-MOS, long channel versus short channel device.

UNIT 3:
SINGLE-STAGE AMPLIFIERS:Basic concept, common source stage with resistive load, Diode connected load, current source load, source degeneration, source follower, common gate stage, cascode stage, folded cascode, choice of device models, basic differential amplifiers pair, qualitative & quantitative analysis, Gilbert cell.
PASSIVE & ACTIVE CURRENT MIRRORS:Basic current mirrors, cascode current mirrors, active current mirrors, large-single & single-single analysis, common mode properties.
FREQUENCY RESPONSE OF AMPLIFIERS & NOISE:General considerations, miller effect, association of poles with nodes, C.S stage, source followers, common gate stage, cascode stage, differential pair, duel of mirror's theorem. Types of noise, thermal noise, flicker noise, representation of noise in circuits, noise in single stage amplifier, C.S. stage, C.G. stage, source followers, cascade stage, noise in differential pairs, noise bandwidth.

UNIT 4:
FEED BACK:Properties of feedback circuit, type of amplifiers, feedback topologies, voltage feedback, current-voltage feedback, voltage-current feedback, current-current feedback, summary of loading effects, effects of feedback on noise.
OPERATIONAL AMPLIFIER:General considerations, performance parameter, One stage Op-amps, Two stage Op-amp, gain boosting, comparison, common mode feedback, input range limitations, slew rate, power supply rejection, noise in op-amps.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Behzad Razavi , Design of analog CMOS Integrated circuits, (MGH).

B.TECH VII SEMESTER
INTRODUCTION TO INFORMATION TECHNOLOGY
(ECT – 429)

L	T	P
3	2	-

Theory :75
Sessional. : 50
Time : 3 Hrs

UNIT – I:
REVIEW OF TCP/IP AND INTERNET: TCP & UDP, Gateway and Routing protocols, Telnet and FTP, DNS, NFS, NIS, APS.
BROADBAND ISDN AND ATM : Services, architecture B-ISDN protocol. ATM – virtual path/virtual channel characteristics, control signaling, ATM cells ATM adaptation layer.

UNIT – II:
WIRELESS NETWORKING & MOBILE COMMUNICATIONS: Wireless LANs : Radio wave LANs, Infrared LANs, Microwave LANs - applications, standards and protocols. Cellular Systems, Frequency reuse, channel assignment strategies, Hand off. Introduction to GSM & CDMA – Service and features, architecture, channel types.

UNIT – III:
MULTIMEDIA SYSTEMS : Digital audio representation and processing, Audio in Computer applications, its digital representation, transmission and digital processing, speech recognition and generation.Digital video and image compression – Video Compression techniques and standardization of algorithms, JPEG, MPEG.
MULTIMEDIA AND INTERNET : Client server technology, communication protocols, internet addressing, WWW, HTML and Web authoring, Web page browser, Bandwidth and application considerations, design considerations for web pages, accessing content on Internet.

UNIT – IV:
E-COMMERCE : Components of E-Commerce, Types of Electronic payments, digital token based systems, smart cards.Network security – Cryptography, authentication protocols, digital signatures, firewalls etc. Introduction to mobile commerce, Blue tooth technology & WAP.
DATA ORGANIZATION : Shared Vs. distributed data bases, basic concepts of file management, introduction to DBMS & types of database organization, features of a DBMS, Data mining.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. A.S. Tanenbaum : Computer Networks, Prentice Hall of India .
2. Raymond P.Wenig : Wireless LANs, Academic Press Ltd.
3. John F Koegel Bufod : Multimedia Systems, Addison Wesley .
4. Curtin, Kim Foley, Kunal Sen, Cathleen Mosin : Information technology – The Breaking Wave. TMH.

E-Business
(ECT-431)

L	T	P		
3	2	-	Theory:	75
			Sess. :	50
			Time :	3 Hrs

1. **NEW INTERNET ECONOMY & E-BUSINESS** :Electronic Commerce Basic, Internet and Web Demographics, E-Business and the New Economy, E-Business models Factors Affecting E-Business Success Exploting E-Business Advantages.

2. **CREATING & BUILDING E-BUSINESS** : Electronic payment methods, E-Business plan Organization, Vision & Mission Statements, Issue Analysis & Critical Risks, Unserstanding legal issues Building your brand, Selecting technology & technology service providers.

3. **DESIGINING WEB SITE :** Setting Web Site goals, Analyzing Web site's structure, Recognizing effective Web Design Identifying Web Development Tools Testing & Maintaining Web Site.

4. **SECURITY ISSURS :** General Issues, Network and Web-Site Security Risks, E-Business security,E-business security providers, E-business risk management issues.

5. **BACK-END SYSTEMS & FINAL LANUCH :** Defining Front-End Web- based Systems with back-end systems, Back procedure & Disaster Recovery plans Fulfillment process & fullfillment management, Marking of E-business, Pronotion & Adverstising Measuring Web-Site return on investment.

NOTE:
There will be eight questions in all. At least one question will be from each unit . The student will be required to attempt any five questions.

REFERENCES:

1. Napier & Judd , Creating a winning E-Business, Vikas Publns.,New Delhi, 2001.
2. Kala Kota & Wninston , Frontiers of Electronic Commerce , Addison-Wesley, 1999.
3. Bajaj & Nag, , E-Commerce, Cutting Edge of Business, Tata Mc Graw Hill, 1999.

B.TECH VII SEMESTER
RADIO AND TV ENGINEEING
(ECT-433)

L	T	P
3	1	-

Theory : 75
Sessional : 50
Time : 3 Hrs

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Radio Receivers.
TRF receivers, Superlet receivers, AM broadcast receivers, RF amplifier, Image frequency signals and their rejection, frequency changing choice of L.O. frequency and tracking IF amplifiers, choice of intermediate frequency, Detector, AVC, DAVC, Tone control circuits tuning control, Band spread tuning, communication receivers, Adjustable selectivity, Noise limiter, squelch circuit, Tuning indicator, AFC, volume expander, Automatic selection of channels, SSB receivers, Diversity reception, FM receivers, Measurement receiver performance.

Television:

Elements of TV system, scanning, flicker and interlaced scanning fine structure, composite video signal, channel B.W. Vestigial side band transmission and reception, TV standards.

Picture tube, Camera Tubes – Image orthicon, Videocon, Plumbicon, Television receiver details, transmission interference, transmitting and receiving antennas, transmission lines, system wave form separation, vertical sync. Separation, Horizontal sync separation, AFC, EHT generation, Sound signal separation.

Essentials of colour TV compatability, three colour theory chromaticity diagram, Luminance and colour difference signal Delta gun and PIL colour Picture tube, Purity and convergence, Modulation of colour difference signal, formation of crominance signal, NISC colour TV transmitter and receiver limitation of NISC system.
NOTE:
There will be eight questions in all. The student will be required to attempt any five questions

REFERENCES:

1. Gulati RR , Monochrome & Colour Television
2. Anokh Singh , Principles of Communication Engg.

B.TECH VII SEMESTER
ACOUSTIC ENGINEERING
(ECT-435)

L	T	P
3	1	-

Theory : 75
Sessional : 50
Time :3 Hrs

UNIT – I:
INTRODUCTION: Sound v/s acoustics, vibrating bodies, principle of superposition, Energy density, sound quality, use of electrical analogs, applied acoustics, system of units.
PARTICLE VIBRATION THEORY: Simple SHM, Energy in SHM, Mathematical v/s audible beats, convergence, damped vibrations, velocity and displacement resonance, some applications of theory of forced vibrations.
PLANE WAVES IN AIR: Introduction, dilatation and condensation, bulk modulus, differential equations and solution, graphical representation, energy in the wave, intensity "level", pressure "level".

UNIT – II:
WAVES IN THREE DIMENSIONS: differential equations and their solutions, sources and their qualitative analysis and applications.
INTERFERENCE PATTERNS: definition, diffraction, single slit pattern, Huygens' principle, multiple slits and openings, Fresnel laminar zones.

UNIT – III:
ACOUSTICS IMPEDANCE: principle of analogy, types, Helmohltz resonator.
REFLECTION AND ABSORPTION OF SOUND WAVES: Introduction, reflection of longtitudinal waves at a boundary infinite in extent, practical implications, absorbing ranges good reflectors and good absorbers.
SPEECH AND HEARING: Importance of subjective elements, vocal apparatus, vocoder, energy distribution as a function of frequency, voice properties, hearing process, organs of sensation, frequency perception, hearing data for normal ear, threshold of audibility, loudness and loudness level, pitch v/s frequency, consonance and dissonance.

UNIT – IV:
REPRODUCTION OF SOUND: Introduction, general problems, early transducers, ideal transducer, blocked v/s motional impedance, acoustics phase inverter, other types.
MISC. TOPICS: acoustics properties of room, reverberation time, acoustics filters, ultrasonics, piezoelectric generators.

NOTE:
1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:
1. Robert H. Randall, An Introduction to Acoustics
2. T.M. Yearwood, Acoustics

B.TECH VII SEMESTER
MEASUREMENT SYSTEMS
(ECT-437)

L	T	P
3	1	-

Theory :75
Sessional :50
Time : 3 Hrs

INTRODUCTION : Generalized configuration and functional description of measuring Instruments. Generalized Performance Characteristics of Instruments.

MOTION MEASUREMENT : Fundamental standards, relative displacement, translational and rotational, relative velocity, translational and rotational, relative – acceleration Measurements, Seismic – (absolute-) displacement Pickups . Accelerometers.

FORCE, TORQUE AND SHAFT POWER MEASUREMENT: Standards and Calibration, basic methods of force measurement, Characteristics of elastic force Transducers, Torque measurement on rotating shafts, dynamometers.

PRESSURE AND SOUND MEASUREMENT : Standards and Calibration. Basic methods of pressure measurement, Dead-weight Gages and Manometers, elastic Transducers, High Pressure Measurement, Low-pressure (vacuum) measurement, Sound measurement.

FLOW MEASUREMENT : Local flow velocity, magnitude and direction, Gross volume flow rate, Gross Mass flow rate.

TEMPERATURE MEASUREMENT : Standards and Calibration, thermal – expansion Methods, thermo-electric Sensors, Electrical – resistance Sensors.

MISCELLANEOUS MEASUREMENT : Time, frequency and Phase angle measurement, Liquid level, humidity.

NOTE:
There will be eight questions in all. At least one question will be from each unit . The student will be required to attempt any five questions

REFERENCES:
1. Ernest O.Doeblin , Measurement Systems , Application and Design, Mc Graw-Hill.
2. A.K.Sawhney , A course in electrical and electronic measurement and Instrumentation.

B.TECH VII SEMESTER
COMMUNICATION ENGINEERING
(ECT-439)

L	T	P
3	1	-

Theory : 75
Sessional : 50
Time : 3 Hrs

1. COMMUNICATION SYSTEM : Need for Modulation, Frequency spectrum of non-sinusoidal waves. Amplitude modulation theory, Generation of an using Grid modulation and plate modulation class C amplifier, modulated transistor amplifier. Block diagram of AM transmitter and Receiver. Frequency Modulation, Phase Modulation, Generator of FM (Direct Methods).
2. RADAR SYSTEMS: Rader Range equation, Basic pulsed radar system, MTI, CW Doppler radar, FMCW radar.
3. TELEVISION FUNDAMENTALS : TV transmitter & Receiver block diagrams, TV Standards, Scanning, Blanking & Synchronizing pulses, BW receiver Block diagram, color combination, color transmission, color reception.
4. PULSE & DATA COMMUNICATIONS : Information in a Communication System, Coding, Generation and Reception, PWM, PPM, PCM, Introduction to Telegraphy (and Telex), Telemetry.
5. BROADBAND COMMUNICATION SYSTEMS : Frequency Division Multiplexing, Time division multiplexing, Introduction to microwave link, Troposphere scatter link, Satellite Communications. Carrier Communication on power lines.

NOTE:
There will be eight questions in all. At least one question will be from each unit . The student will be required to attempt any five questions

REFERENCES:

1. George Kennedy , Electronics & Communication Systems,PHI
2. N.N. Biswas ,Line Communication

B.TECH VIII SEMESTER
WIRELESS AND MOBILE COMMUNICATION
(ECT-406)

L	T	P
3	2	-

Theory :75
Sessional :50
Time :3 Hrs

UNIT – I:
Radio Propagation Characteristics, Models for Path loss, Shadowing & Multipath fading-delay spread, Coherence bandwidth, Coherence Time, Doppler Spread Jake's Channel model.

UNIT – II:
Digital Modulation for Mobile radio, Analysis under fading channel, diversity techniques and Rake demodulator. Introduction to Spread Spectrum Communication Multiple Access Techniques used in Mobile Wireless Communications: FDMA/TDMA/CDMA.

UNIT – III:
The Cellular concept, Frequency Reuse basic theory of hexagonal cell layout, spectrum efficiency, FDM/TDM, Cellular System, channel allocation schemes, Handover Analysis, cellular CDMA, Soft capacity, Erlang capacity comparison.

UNIT – IV:
Wireless standards-GSM, IS-95, UMTS-IMT-2000, Signaling, Call Control, Mobility Management and location Tracing.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Theodore S.Reppeport, Wireless Communications Principles and Practice, IEEE Press, Prentice Hall.
2. William C.Y.Lec, Mobile Cellular Telecommunications, Analog and Digital Systems, Mc-Graw Hill Inc.
3. Kamilo Feher, Wireless Digital Communications, Modernization & Spread Spectrum Applications, Prentice Hall of India, New Delhi.
4. Kaveh Pahlavan and Allen H. Levesque " Wireless Information Networks", Wiley Series, John Wiley and Sons Inc.

B.TECH VIII SEMESTER
TRANSPORT AND ACCESS TECHNOLOGIES
(ECT-408)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	: 3 Hrs

UNIT – I:
TRANSPORT LAYER: End-to-End delivery, Addressing, Reliable delivery., Flow Control, Transport classes.
TCP/IP: Architecture, Internet Protocols, IP functions, TCP Operations, IPv6, UDP, and Mobile IP.

UNIT – II:
NETWORKING DEVICES: Repeaters, Bridges, Routers, Application examples, Internet Routing : Protocols, Security, Switch based Routing, Routing in S/W Multicasting, Mobile routing.
INTERNET ACCESS. PPP, SLIP Applications.

UNIT – III:
N/W ARCHITECTURE SUPPORTING BROADBAND: ISDN-Services, Subscriber Access, Layers, BISDN, ADSL, HDSL, BDSL, VDSL, Wireless, HFC/Cable Moderns, FTTC, FTTH, and FTTB.
ATM: Basic Principle, Design Goals, topology, Protocol, Protocol reference, modes, Layers, Objects, Adaptation Layer, Physical Layer, Interfaces, Access N/Ws, Switching Modes, Transmission Signaling, Wireless ATM, Mobile ATM.

UNIT – IV:
SONET/SDH. Signal Hierarchy, line rates, SONET Devices, Layers, Frame, Multiplexing STS Frame.
FDDI, Fiber Channel, Frame Relay, SMDS.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Alberto Leon-Garcia, Indra Widjaja, Communication Networks, Fundamental Concepts & Key Architectures, Tata MGH, New Delhi.
2. Daniel Minoli, Internet and Intranet Engineering, Tata, MGH, New Delhi.
3. L.G.Guthbert and J.C.Sapanel, ATM, The Broadband Telecommunications Solutions, MGH.

B.TECH VIIIth SEMESTER
NEURO-FUZZY SYSTEMS
(ECT-410)

L	T	P		
3	2	-	Theory	: 75
			Sessional	: 50
			Time	:3Hrs

UNIT-I :
INTRODUCTION TO FUZZY AND NEURO-FUZZY SYSTEMS: Merits of Fuzzy and Neuro Fuzzy systems. Introduction to Architecture of a Fuzzy systems, fuzzification Rule Base, Inference engine, defuzzizication.
FUZZY MATHEMATICS: Fuzzy sets and operations of fuzzy sets, properties of fuzzy sets, fuzzy relations, fuzzy graphs & Fuzzy arithmetic.

UNIT-II :
ARCHITECTURE AND DESIGN ISSUES : - Fuzzification , fuzzy Rule – Base and Fuzzy – Rule Based models – implication process, defuzzification Techniques.
ANALOG DESIGN OF FUZZY PROCESSORS: Modular design, design of a fuzzifier, knowledge base and inference engine, defuzzifier design.

UNIT-III :
IMPLEMENTATION OF A COMPLETE ANALOG FUZZY SYSTEMS : Design and microprocessor based implementation of Fuzzy systems.
FUZZY MODEL IDENTIFICATION: Structure Specifications, Parameter estimation, model validation.

UNIT-IV :
NEURO FUZZY SYSTEMS: Introduction to Neural Networks, Neuro Fuzzy Architecture, Learning methodologies. Genetic Algorithms, neural networks in communications.

NOTE:

1. The question paper shall consist of nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. KLIR & YUAN, Fuzzy Sets and Fuzzy Logic .
2. CHIN-TENG LIN & C.S. GEORGE LEE, Neural Fuzzy Systems, Prentice Hall International , 1996.
3. N.K.Bose, P.Liang , Neural Networks Fundamentals with graphs, Algorithms and Applications , Tata McGraw Hall, Ed. 1998.

B.TECH VIII SEMESTER
MICROWAVE LAB(Pr)
(ECT-414)

L	T	P
-	-	3

Sessional :25
Viva :25
Time :3 Hrs

LIST OF EXPERIMENTS

1. To study the microwave components.
2. To study the characteristics of the reflex Klystron tube and to determine its electronic tuning range.
3. To determine the frequency and wavelength in a rectangular waveguide working in TE IO mode.
4. To determine the standing wave ratio and reflection coefficient.
5. To study the I-V characteristics of Gunn diode.
6. To study the magic tee.
7. To study the isolator and attenuator.
8. To measure the coupling coefficient and directivity of a wave guide directional coupler
9. To measure the polar pattern and the gain of a waveguide horn antenna.
10. To measure the insertion loss and attenuation.

B.TECH VIII SEMESTER
AUDIO VISUAL ELECTRONICS(Pr)
(ECT-416)

L	T	P
-	-	3

Sessional :25
Viva :25
Time :3 Hrs

LIST OF EXPERIMENTS

1. Familiarization of PCBs and Mechanical Components of Tape recorder/ CD Player/VCD Player/Colour TV.
2. Study of tuner section of a Colour T.V.
3. Study of VIF section of a Colour T.V.
4. Study of Sound section of a Colour T.V.
5. Study of Chroma section of a Colour T.V
6. Study of Mechanical portion of VCD player.
7. Study of Sound processing of VCD player.
8. Study of Camcorder's mechanical portion.
9. Study of Camcorder's Electronic portion.

B.TECH VIII SEMESTER
NETWORK MANAGEMENT AND SECURITY
(ECT – 420)

L	T	P
3	2	-

Theory :75
Sessional :50
Time :3 Hrs

UNIT I

Introduction to network management, network management standards, OSI management framework, simple network management protocol, telecommunication management networks, application level gateways, features of proxies, Web proxies, integrated security management architecture, TCP/IP, v1, v2, v3, RMON, Security in Ipv6-design goals, authentication header, encapsulating security payload

UNIT II:

Network security requirements, threats, security plan (RFC 2196) security mechanisms, common system problems, Network security mechanism layers, Firewalls-sniffing, spoofing, TCP session, denial of service, anatomy, dual homed gateway configuration, types of firewalls, single choke configurations, screened host configurations screened subnet configuration Packet filtering network address transactions

UNIT III:

Secure web transactions, Data encryption techniques, Decryption, Symmetric/Private key, DES, IDEA, Public key encryption, One way functions, Trapdoor one way functions, RSA encryption, message integrity, MD5 utility, Digital signature, Pretty Good Privacy, Signed and secret messages, digital certificates, certification authority,

UNIT IV:

Electronic commerce, electronic payment systems, Secure socket layer, SSL handshake protocol, Secure HTTP, Secure end to end protocols, credit card based methods, electronic cheques, autonomous payment micro payment, smart cards, m -commerce and security, types of security, acceptable level, Security issues in wireless communications, wireless transport layer security handshake

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. William Stallings, Cryptography and network security, Prentice hall press.
2. Simson Garfinkel and Gene Spafford, O' Reilly, Practical Unix and Network Security ISBN,1-56592-148-8.
3. Dale Bulb rook, WAP- A Beginner's guide, TMG 2001
4. State of the Art in electronic payment systems, IEEE Computer 30/9(1997) 28-35.
5. Websites –www.cerias.purdue.edu (center for education and research in information assurance
6. and security)
7. www. echeck.org

B.TECH VIII SEMESTER
IMAGE PROCESSING
(ECT – 422)

L	T	P
3	2	-

Theory :75
Sessional :50
Time :3 Hrs

UNIT – I:
INTRODUCTION: Image Processing Fourier Transform and Z-Transform Causality and stability Toeplit and Circulate Metrics orthogonal and unitary Matrices and Kronecker product, Markov Processes KI Transform Mean square Estimates and Orthogonal Principles.
IMAGE SAMPLING QUANTIZATION : Band Limited Image Sampling Versus Replication, Reconstruction of Image from samples Sampling Theorem, Sampling Theorem for Random Fields, Optimal Sampling, Nonrectangular Grid Sampling, Sampling Aperture, Display Aperture/ Interpolation Functions, Lagrange Interpolation Moire Effect. Image Quantization Uniform Optimal Quantizer, Properties of Mean Square Quantizer, Commander Design Visual Quantization

UNIT – II:
IMAGE TRANSFORMS: Two Dimensional Orthogonal and Unitary Transforms and their properties. One Dimensional and Two Dimensional DFT Cosine and Sine Transforms. Hadamard, Slant, Harr and KL, Transforms and their properties, Approximation to KI Transforms.
IMAGE REPRESENTATION BY STOCHASTIC MODELS: One Dimensional Causal Models, AR and ARMA models, Non Causal Representation Spectral factorization, Image Decomposition.

UNIT – III:
IMAGE ENHANCEMENT AND RESTORATION: Point Operation, Histogram Modeling, Spatial Operations, Transform Operations, Multispectral Image Enhancement. Image Observation Models, Inverse and Wiener filtering; FIR Wiener Filters, Filtering using Image Transform Causal Models and recursive filtering Maximum entropy restoration. Extrapolation of band limited signal.

UNIT – IV:
IMAGE ANALYSIS AND IMAGE COMPRESSION: Spatial feature extraction, Edge detection and boundary extraction Boundary, region and moment representations structures, Texture, Image Segmentation, Reconstruction from Projections, Pixel Coding, Productive Techniques, Transform Coding Theory, Coding of Image, Coding of two-tone image.

NOTE:
1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES :

1. Anil Jain, Digital Image Processing , PHI.
2. Gonzalez and Woods, Image Processing, Addison Wesley & Sons.

B.TECH VIII SEMESTER
SIMULATION MODELLING AND ANALYSIS OF COMMUNICATION SYSTEMS
(ECT- 424)

L	T	P		
3	2	-	Theory	: 75
			Sessional	: 50
			Time	: 3 Hrs

UNIT - I:
Statistical description of data, data fitting methods, method of least squares, regression analysis, regression fallacy, multiple regression, analysis of variance, goodness of fit, tests of good ness of fit

UNIT - II:
Concept of random variable**,** vector random variable, Probability and statistics, random processes, discrete and continuous distributions, central limit theorem, measure of randomness, Monte Carlo methods stochastic processes

UNIT - III:
Introduction to estimation, elements of estimation, random sampling, sampling distributions, tests for hypothesis, Sequence of IID, Markov chain, Time series models, Markov chain, Time series models

UNIT - IV:
Modeling and simulation concepts, discrete event simulation, event scheduling, modeling complex systems, simulation model, selecting input probability distribution, random number generators, generating random variables, output data analysis for a single system, statistical techniques for comparing alternative systems, variance reduction techniques, verification and validation of simulation models, experimental design and optimization

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Averill Law, Simulation Modeling and analysis. TATA MGH .
2. Banks J. Carson J.S. and Nelson B., Discrete Event System Simulation, PHI.
3. Athnasios Papoulis, Probability, Random variables and stochastic Processes, McGraw Hill.

B.TECH VIII SEMESTER
ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS
(ECT- 426)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	:3 Hrs

1. Introduction: - Definition of AI, evolution of Computing, History of AI, Classical, Romantic and Modern period, subject area, Architecture of AI machines, logic family, conclusion.
2. Production System: - Production rules, the working memory, Recognize-act cycle, conflict resolution strategies, refractoriness, Regency, specificity, alternative approach for conflict resolution, Architecture of production system, conclusion.
3. Prepositional Logic: - Proposition, tautologies, Theorem proving in prepositional logic, Semantic method of theorem proving, forward chaining, backward chaining, standard theorems in prepositional logic, method of substitution, theorem proving using Wang's algorithm, conclusion.
4. Predicate Logic: - Alphabet of First order logic (FOL), predicate, well formed formula, clause form, algorithm for writing sentence into clause form, inflict of predicates, unification algorithm, resolution Robinson's inference rule, conclusion.
5. Logic Programming and Prolog: - Logic program, Horn clause, program for scene interpretation, unification of goals, definite perform clause, SLD resolution, SLD tree, controlling back tracking, common use of cut, implementation of backtracking using stack, risk of using cuts, fail predicate, application of cut-fail combination, replace cut-fail by not, conclusion.
6. Default & Non monotonic reasoning: - Axiomatic theory, non-atomic reasoning using NML-I, problems with NML-I, reasoning with NML-II, truth maintenance system with example, conclusion.
7. Imprecision & Uncertainty: - Definition, Probabilistic technicians, Fuzzy reasoning, certainty factor based reasoning conditional probability, Baye's Theorem and its limitations, Bayesian belief network, propagation of belief, Dempster-Shafer theory of uncertainty management, belief interval, Fuzzy ration, inverse Fuzzy relations, Fuzzy post inverse, Fuzzy Inversion scope of neural network, EX-OR classifier, clustering by neural network, function approximation by neural net, retrieval of content, Fuzzy association memory, cognitive reasoning using fuzzy neural net, Hebbian learning, stability analysis.
8. Intelligent Search Technique: - Heuristic function, AND-OR graph, Heuristic search, A* algorithm and examples.

NOTE:
The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

REFERENCES:
1. E.Charniak & D. McDermott , Introduction to Artificial Intelligence , Addison Wesley Longman.

B.TECH VIII SEMESTER
SOFTWARE ENGINEERING
(ECT- 428)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	:3 Hrs

Introduction
Introduction to Software crisis & Software processes; Software life cycle models – Build & Fix, waterfall prototype evolutionary, spiral model.

1.Requirement Analysis & Specifications
Problem Analysis – DFD, Data dictionaries, ER diagrams, object diagrams; approaches to problems analysis; SRS; specifying behavioral & non-behavioral requirements.

2Software Design
What is design? Modularity, strategy of design, function oriented design, object oriented design.

3Software Metrics
Introduction, size metrics, data structure metrics, information flow metrics, entropy-based measures, metric analysis.

4Software Reliability
Importance, Software reliability & Hardware reliability, failures & faults, reliability concepts, reliability models – macro, basic, logarithmic Poisson, calendar time component, micro models; estimating number of residual errors; reliability allocation.

5Software Testing
Introduction, Functional testing, structural testing, activities during testing, debugging, testing tools.

6Software Maintenance
Introduction, types of maintenance, maintenance process, maintenance models, reverse engineering, re-engineering.

Note:- There will be 8 question in all. Attempt any 5 questions. There will be max 1 question from unit 1 & unit 6 each and minimum 1 question from each of remaining units.

REFERENCES:

1. R.S. Pressman, Software Engineering – A Practitioner's Approach, 5th Ed, TMH, 2000.
2. Ian Sommerville, Software Engineering, 4th Ed., Addison Wesley.
3. Pankaj Jalote, An Integrated Approach to Software Engineering 2nd Ed, Narosa Publishing.

B.TECH VIII SEMESTER
ADVANCED CONTROL SYSTEMS
(ECT- 430)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3 Hrs

UNIT1.
State variable representation of systems by various methods, solution of state equations- state transition matrix, Transfer function from state variable model. Controllability and observability of state variable model.

UNIT2.
Phase portrait of linear second systems, Method of isoclines, phase portrait of second order system with non-linearities, limit cycle, singular points.

UNIT3.
Definition, limitations, use of describing function for stability analysis, describing function of ideal relay, relay with hytsteresis and dead zone, saturation/columb friction and backlash. Linear approximation of nonlinear systems: Taylor series, Liapunov's 2nd method.

UNIT4.
Sampling process, impulse modulation, mathematical analysis of sampling process, application of Laplace transform, Shanoon's theorem, reconstruction of sampled signal o order and first order hold, Z-transform, definition, evaluation of z-transform, inverse Z-transform pulse transfer function, limitation of Z-transform, state variable formulation of discrete time systems. Solution of discrete time state equations, stability, definition, the Schur-Cohn stability criterion, Jury's test of stability of extension of Routh-hurwitz criterion to discrete time systems.

NOTE:

1. The question paper shall have nine questions in all. The candidate shall have to attempt five questions.
2. There will be one compulsory question from all the four units combined.
3. Remaining eight questions shall be organized into four sections, each section having two questions from each of the four units. The candidate shall be required to attempt one question from each section

REFERENCES:

1. Gopal M, Digital Control and State Variable Methods, TMH
2 Kuo,BC,DigitalControlsystems,
3 Slotine JE & Li WP, Applied Non-Linear Control , Prentice Hall, USA.

B.TECH VIII SEMESTER
PRINCIPLES OF OPERATING SYSTEMS
(ECT- 432)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	:3 Hrs

1. Introductory Concepts:Operating system functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service system calls, system programs, Interrupt ;mechanisms.

2. File Systems:Functions of the system, File access and allocation methods, Director Systems: Structured Organization, directory and file protection mechanisms, implementation issues; hierarchy of file and device management.

3. CPU Scheduling:Levels of Scheduling, Comparative study of scheduling algorithms, multiple processor scheduling.

4. Storage Management:Storage allocation methods: Single contiguous allocation, Multiple contiguous allocation, Paging, Segmentation combination of Paging and Segmentation, Virtual memory conceptus, Demand Paging, Page replacement Algorithms, Thrashing,

5. Device Management:Hardware Organization, Device scheduling policies

6. Deadlocks:Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.

7. Concurrent Processes:Critical section problem, Semaphores, Classical process coordination problems and their solutions, Interprocess Communications.

8. Protection:Mechanisms and Policies, Implementation.

9. Case Studies:Detailed study of two operating systems UNIX and DOS.

NOTE:
The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

REFERENCES:

1. Peterson, J.L. & Silberschatz, A.: Operating System Concepts, Addison, Wesley, reading.
2. Brinch, Hansen: Operating System Principles, Prentice Hall of India.
3. Haberman, A.N.: Introduction to Operating System Design Galgotia Publication, New Delhi.
4. Tanenbaum, A.S.: Operating System.
5. Hansen, P.B.: Architecture of Concurrent Programs, PHI.
6. Shaw, A.C.: Logic Design of Operating Systems, PHI.

B.TECH VIII SEMESTER
NANOTECHNOLOGY
(ECT- 434)

L	T	P
3	2	-

Theory :75
Sessional : 50
Time : 3 Hrs

UNIT 1. Semiconductor nanoparticles

UNIT2. Preparation and Characterization of nanoparticles . Quantisation phenomenon in nanostructured superconductors.

UNIT 3 . Properties and application of nanocrystalline electronic junctions

UNIT 4. Synthesis of semiconductor nanoclusters . Processing of nanomaterials

NOTE:
The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

REFERENCES :

1. Camarata, R.C , Nanomaterials synthesis, properties and application . Institute of Physics Publication.
2. Madou, Fundamentals of microfabrication , Mcgraw Hill.
3. Sibelia, J.P , A Guide to material charaterisation , Prentice Hall.

B.TECH VIII SEMESTER
IC FABRICATION PROCESSES
(ECT- 436)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	:3 Hrs

UNIT-I
Environmental Requirements for IC Fabrication, Introduction to Si IC processing, crystal Growth, Vapour phase epitaxy.

UNIT-II
Oxidation : Thermal oxidation process- oxidation kinetics, SiO2 applications. Plasma Oxidation. Lithography : Photo, e-heam and x- ray lithography. Process and equipments.

UNIT-III
Diffusion : Fick's Laws, constant and limited source diffusion, Diffusion Sources, Equipment, Calculation of junction depth. Lon-Implantation : Basic process, equipment, Introduction to Range theory.

UNIT-IV
Metallization : Physical Vapour deposition – Equipment, Metallization Choices, problems, Sputtering.

UNIT-V
Packajing & Assembly Techniques Isolation Techniques, Fabrication process sequence for bipolar IC's and nMOS IC's.

NOTE:
At least one question must be set from each unit. A total of eight questions are to be set.

REFERENCES :

1. VLSI Technology by SM Sze, McGraw Hill (1988)
2. VLSI Fabrication Principles by Ghandhi SK, Prentice Hall.

B.TECH VIII SEMESTER
OP-AMP APPLICATIONS
(ECT- 438)

L	T	P
3	2	-

Theory :75
Sessional :50
Time :3 Hrs

UNIT-1 :
The operational amplifier, block diagram representation of an op amp, the ideal op-amp, equivalent circuit of an op- amp, ideal voltage transfer curve, frequency response , characteristic parameters , op-amp configurations.

UNIT-2 :
Op-amp with feedback ,inverting and non-inverting amplifiers, effects of feedback..

UNIT- 3 :
Op-amp applications: summing, scaling, ,averaging amplifiers,instrumentation amplifier, voltage to current converter with floating load, voltage to current converter with grounde load, current to voltage converter, very high input impedance circuit,the intregrator, the differentiator, ,peak detector,sample and hold circuit.

UNIT –4 :
Non-linear applications: basic comparator,zero-crossing detector,scmitt trigger, clippers and clampers,Multivibrators,

NOTE:
The question paper will contain 8 questions in all. The student will be required to answer any five. At the most one question will be set from each section.

REFERENCES:

1. Ramakant A. Gayakwad.,Op-amp and linear integrated circuits ,PHI

B.TECH VIII SEMESTER
THEORY AND APPLICATIONS OF DIGITAL SIGNAL PROCESSING
(ECT- 440)

L	T	P		
3	2	-	Theory	:75
			Sessional	:50
			Time	:3 Hrs

UNIT – I :
INTRODUCTION:Signal, Systems and signal processing, classifications of signals, concept of frequency in continuous time and discrete time signals. Analog to digital and digital to analog conversion.
DISCRETE TIME SIGNALS AND SYSTEM; Discrete time signals, Discrete time systems, LTI systems, difference equations, implementation of discrete time systems.

UNIT – II:
Z TRANSFORM AND ITS APPLICATION: Z Transform, properties of Z transform, Inversion of Z transform, applications of Z transform.
Discrete Fourier Transform, its properties and applications: Discrete fourier transform, properties of DFT, Linear filtering methods based on the DFT, frequency analysis of signals using the DFT.

UNIT- III:
Fast Fourier transform and its applications: FFT algorithms (Radix 2 FFT) algorithm.
Implementation of Discrete time systems: Structures for FIR systems, direct form structure
Cascade form structure, parallel form, structures for IIR systems, cascade, direct form and parallel form structures.

UNIT – IV:
DESIGN OF DIGITAL FILTERS: Design of IIR filters Bilinear transformation and Impulse invariance method. Matched Z transformation design of FIR filters with different methods.

NOTE:
The question paper will contain 8 questions in all. The student will be required to answer any five. At the least one question will be set from each section.

REFERENCES:

1. John G. Proakis and Dimitris G. Manolakis, Digital Signal Processing, PHI.
2. Oppenheim & Schaffer, Digital Signal Processing, PHI.
3. Rabiner & Gold, Digital Signal Processing applications, PHI.
4. S.K. Mitra, Digital Signal Processing by, TMH.
5. S. Salivayhan, A Vallavraj, C. Gnanapriya, Digital Signal Processing, TMH.

B.TECH VIII SEMESTER
MOBILE COMMUNICATION
(ECT- 442)

L	T	P
3	2	-

Theory : 75
Sessional : 50
Time : 3 Hrs

UNIT – I.

Introduction to Paging Systems and cordless telephone systems, Basic Cellular concept, frequency reuse, Interference, capacity improvement, trunking,

Mobile radio propagation: Propagation mechanisms, path loss, path loss prediction models, Okumara and HATA model, log distance path loss model, fading, Ray tracing, Two ray- Rayleigh fading model.

UNIT – II.

Diversity Techniques, Macroscopic and microscopic combining techniques, RAKE receiver, USDC Codec.

Frequency management, frequency spectrum utilization, channel assignment, FCA, DCA, spread spectrum, frequency hopping in cellular CDMA.

UNIT – III.

Handoffs, queuing of handoffs, mobile assisted handoffs, soft handoffs, cell site handoffs, Intersystem handoffs, dropped call.

Wireless networking: generations of wireless networks, CDPD, ARDIS, RMD, CCS, SS-7, UMTS, Wireless LAN.

UNIT – IV.

Intelligent cell concept, Advanced Intelligent networks, SS-7 network, ISDN for AIN, AIN for mobile communication.

NOTE:

The question paper will contain 8 questions in all. The student will be required to answer any five. At the least one question will be set from each section.

REFERENCES;

1. Theodre S. Rappaport, Wireless Communications, Principles and Practice, IEEE Press Prentice Hall.
2. William C Y Lee, Mobile Cellular Telecommunications, Analog and Digital Systems, Mc-Graw Hill Inc.

(1 st SEMESTER)

(Common to all Branches)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-102	English Language **OR**	2	2	-	4	75	25	-	100	3
2	MET-102	Manufacturing Processes	3	1	-	4	75	25	-	100	3
3	HUT-104	Engineering Economics **OR**	3	1	-	4	100	50	-	150	3
4	ECT-103	[Basic Electronics Eng. and	2	2/2	-	3	75	25	-	100	3
5	ECT-105	Basic Electronics Eng. (Pr)]	-	-	2/2	1	-	10	40	50	3
6	MAT-103	Mathematics-I	3	2	-	5	100	25	-	125	3
7	PHT-104	Physics-I	3	1	-	4	100	25	-	125	3
8	CHT-104	Chemistry - I	3	1	-	4	75	25	-	100	3
9	ELT-102	Basic Electrical Engineering **OR**	2	2/2	-	3	75	25	-	100	3
10	COT-103	Computer Engineering *	2	2/2	-	3	75	25	-	100	3
11	CET-102	Engineering Graphics-I	-	-	3	3	75	25	-	100	4
12	PHT-105	Physics-I (Pr)	-	-	2	2	-	10	40	50	3
13	CHT-105	Chemistry-I (Pr)	-	-	2	2	-	10	40	50	3
14	ELT-104	Basic Electrical Engineering.(Pr)	-	-	2/2	1	-	10	40	50	3
15	COT-105	**OR** Computer (Pr) *	-	-	2/2	1	-	10	40	50	3
16	MET-104	Workshop-I (Pr)	-	-	3	3	-	10	40	50	3
		TOTAL	15/17	8/7	12/11	35	575/600	225/240	200/160	1000	

(2 nd SEMESTER)

(Common to all Branches)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MET-102	Manufacturing Processes **OR**	3	1	-	4	75	25	-	100	3
2	HUT-102	English Language	2	2	-	4	75	25	-	100	3
3	HUT-104	Engineering Economics **OR**	2	2/2	-	3	100	50	-	150	3
4	ECT-103	[Basic Electronics Eng. and	2	1	-	3	100	-	-	100	3
5	ECT-105	Basic Electronics Eng.(Pr)]	-	-	2/2	1	-	10	40	50	3
6	MAT-104	Mathematics-II	3	1	-	4	75	25	-	100	3
7	PHT-106	Physics-II **OR**	3	1	-	4	75	25	-	100	3
8	PHT-108	Physics-II	3	1	-	4	75	25	-	100	
9	CHT-106	Chemistry-II	2	1	-	3	75	25	-	100	3
10	COT-103	Computer Engineering **OR**	2	2/2	-	3	75	25	-	100	3
11	ELT-102	Basic Electrical Eng.	2	2/2	-	3	75	25	-	100	3
12	MET-105	Engineering Graphics-II	-	-	6	6	100	50	-	150	4
13	PHT-107	Physics-II (Pr) **OR**	-	-	2/2	1	-	25	25	50	3
14	PHT-109	Physics-II (Pr)	-	-	2/2	1	-	25	25	50	3
15	CHT-107	Chemistry-II (Pr)	-	-	2	2	-	25	25	50	3
16	MET-106	Workshop-II (Pr)	-	-	3	3	-	25	25	50	3
17	COT-105	Computer (Pr) * **OR**	-	-	2/2	1	-	10	40	50	3
18	ELT-104	Basic Electrical Engineering (Pr)	-	-	2/2	1	-	10	40	50	3
		Total	14/15	7/7	14/13	35	575/575	270/310	155/115	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(3 rd SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-201	Industrial Sociology	2	1	-	3	75	50	-	125	3
2	ECT-201	Semiconductor Devices & Applications	4	2	-	6	100	50	-	150	3
3	ECT-203	Network Analysis & Synthesis	3	2	-	5	75	50	-	125	3
4	ECT-205	Fields & Waves	4	1	-	5	100	50	-	150	3
5	ECT-207	Signals & Systems	4	2	-	6	100	50	-	150	3
6	ECT-209	Digital Circuits & Systems	3	2	-	5	100	50	-	150	3
7	ECT-211	Electronics Devices & Circuits(Pr)	-	-	2	2	-	25	25	50	3
8	ECT-213	Internet Applications (Pr)	-	-	3	3	-	50	50	100	3
		Total	20	10	5	35	550	375	75	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(4 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MAT-202	Numerical Analysis	3	1	-	4	75	50	-	125	3
2	ECT-202	Analog Electronics	4	1	-	5	100	50	-	150	3
3	ECT-204	Analog Communication	4	2	-	6	100	50	-	150	3
4	ECT-206	Instrumentation & Measurement	4	1	-	5	100	50	-	150	3
5	ECT-208	Control Systems	4	2	-	6	100	50	-	150	3
6	MET-202	Workshop-II (Pr)	-	-	2	2	-	25	25	50	3
7	ECT-210	Electronic Circuit Simulation (Pr)	-	-	4	4	-	75	50	125	3
8	ECT-212	Communication-I (Pr)	-	-	3	3	-	50	50	100	3
		Total	19	7	9	35	475	400	125	1000	

NOTE: Students will undergo a practical training of 6 weeks duration after the 4th semester examination.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(5 th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	ECT-301	Antenna and Wave Propagation	3	1	-	4	75	50	-	125	3
2	ECT-303	Computer Architecture & Organization	3	2	-	5	75	50	-	125	3
3	ECT-305	Information Theory and Coding	3	2	-	5	75	50	-	125	3
4	ECT-307	Linear IC Applications	3	2	-	5	75	50	-	125	3
5	ECT-309	Micro-Electronics	3	2	-	5	75	50	-	125	3
6	ECT-311	Microprocessors	3	2	-	5	75	50	-	125	3
7	ECT-313	Communication-II (Pr)	-	-	2	2	-	50	25	75	-
8	ECT-315	Microprocessors (Pr)	-	-	3	3	-	50	25	75	-
9	ECT-317	Seminar	-	1	-	1	-	25	-	25	-
10	ECT-319	Training Report	-	-	-	-	-	75	-	75	-
		Total	18	12	5	35	450	500	50	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(6 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	HUT-302	Fundamentals of Management	3	1	-	4	75	50	-	125	3
2	ECT-302	Microwave Engineering	3	2	-	5	75	50	-	125	3
3	ECT-304	VHDL & Digital Design	3	1	-	4	75	50	-	125	3
4	ECT-306	Digital Signal Processing	3	2	-	5	75	50	-	125	3
5	ECT-308	Digital Communication	3	2	-	5	75	50	-	125	3
6	ECT-310	Computer Communication Networks	3	1	-	4	75	50	-	125	3
7	ECT-312	Digital Communication (Pr)	-	-	2	2	-	50	25	75	3
8	ECT-314	Electronic Design (Pr)	-	-	3	3	-	50	25	75	3
9	ECT-316	VHDL (Pr)	-	-	2	2	-	50	25	75	3
10	ECT-318	Seminar	-	1	-	1	-	25	-	25	-
		Total	18	10	7	35	450	475	75	1000	

NOTE: Students will undergo a practical training of 6 weeks duration after the 6th Semester exam.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(7 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	-	Open Elective-I	3	1	-	4	75	50	-	125	3
2	-	Departmental Electives-I	3	2	-	5	75	50	-	125	3
3	ECT-401	Practical Training Report	-	-	-	-	-	75	-	75	-
4	ECT-403	Physical Design of Digital IC's	3	2	-	5	75	50	-	125	3
5	ECT-405	Television & Radar Engineering	3	1	-	4	75	50	-	125	3
6	ECT-407	Optical Communication	3	2	-	5	75	50	-	125	3
7	ECT-409	Electronic Switching Systems	3	2	-	5	75	50	-	125	3
8	ECT-411	Digital Signal Processing (Pr)	-	-	3	3	-	50	25	75	3
9	ECT-413	Minor Project	-	-	3	3	-	50	25	75	3
10	ECT-415	Seminar	-	1	-	1	-	25	-	25	-
Total			18	11	6	35	450	500	50	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(8 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	-	Open Elective-II	3	1	-	4	75	50	-	125	3
2	-	Departmental Electives-II	3	2	-	5	75	50	-	125	3
3	ECT-402	Comprehensive Viva-Voce	-	-	-	-	-	75	-	75	-
4	ECT-404	General Fitness & Professional Aptitude	-	-	-	-	-	-	75	75	3
5	ECT-406	Wireless and Mobile Communication	3	2	-	5	75	50	-	125	3
6	ECT-408	Transport and Access Technologies	3	2	-	5	75	50	-	125	3
7	ECT-410	Neuro-Fuzzy Systems	3	2	-	5	75	50	-	125	3
8	ECT-412	Seminar	-	1	-	1	-	25	-	25	-
9	ECT-414	Microwave (Pr)	-	-	3	3	-	25	25	50	3
10	ECT-416	Audio Visual Electronics (Pr)	-	-	3	3	-	25	25	50	3
11	ECT-418	Major Project	-	-	4	4	-	50	50	100	-
Total			15	10	10	35	375	450	175	1000	

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(3 rd SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	HUT-201	Industrial Sociology	2	1	-	3	75	50	-	125	3	2.5
2	ECT-201	Semiconductor Devices & Applications	4	2	-	6	100	50	-	150	3	5
3	ECT-203	Network Analysis & Synthesis	3	2	-	5	75	50	-	125	3	4
4	ECT-205	Fields & Waves	4	1	-	5	100	50	-	150	3	4.5
5	ECT-207	Signals & Systems	4	2	-	6	100	50	-	150	3	5
6	ECT-209	Digital Circuits & Systems	3	2	-	5	100	50	-	150	3	4
7	ECT-211	Electronics Devices & Circuits(Pr)	-	-	2	2	-	25	25	50	3	1
8	ECT-213	Internet Applications (Pr)	-	-	3	3	-	50	50	100	3	1.5
Total			20	10	5	35	550	375	75	1000		27.5

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(4 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	MAT-202	Numerical Analysis	3	1	-	4	75	50	-	125	3	3.5
2	ECT-202	Analog Electronics	4	1	-	5	100	50	-	150	3	4.5
3	ECT-204	Analog Communication	4	2	-	6	100	50	-	150	3	5
4	ECT-206	Instrumentation & Measurement	4	1	-	5	100	50	-	150	3	4.5
5	ECT-208	Control Systems	4	2	-	6	100	50	-	150	3	5
6	MET-202	Workshop-II (Pr)	-	-	2	2	-	25	25	50	3	1
7	ECT-210	Electronic Circuit Simulation (Pr)	-	-	4	4	-	75	50	125	3	2
8	ECT-212	Communication-I (Pr)	-	-	3	3	-	50	50	100	3	1.5
Total			19	7	9	35	475	400	125	1000		27.0

NOTE: Students will undergo a practical training of 6 weeks duration after the 4th semester examination.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(5 th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	ECT-301	Antenna and Wave Propagation	3	1	-	4	75	50	-	125	3	3.5
2	ECT-303	Computer Architecture & Organization	3	2	-	5	75	50	-	125	3	4.0
3	ECT-305	Information Theory and Coding	3	2	-	5	75	50	-	125	3	4.0
4	ECT-307	Linear IC Applications	3	2	-	5	75	50	-	125	3	4.0
5	ECT-309	Micro-Electronics	3	2	-	5	75	50	-	125	3	4.0
6	ECT-311	Microprocessors	3	2	-	5	75	50	-	125	3	4.0
7	ECT-313	Communication-II (Pr)	-	-	2	2	-	50	25	75	-	1.0
8	ECT-315	Microprocessors (Pr)	-	-	3	3	-	50	25	75	-	1.5
9	ECT-317	Seminar	-	1	-	1	-	25	-	25	-	1.0
10	ECT-319	Training Report	-	-	-	-	-	75	-	75	-	3.0
Total			18	12	5	35	450	500	50	1000		30.0

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(6 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	HUT-302	Fundamentals of Management	3	1	-	4	75	50	-	125	3	3.5
2	ECT-302	Microwave Engineering	3	2	-	5	75	50	-	125	3	4.0
3	ECT-304	VHDL & Digital Design	3	1	-	4	75	50	-	125	3	3.5
4	ECT-306	Digital Signal Processing	3	2	-	5	75	50	-	125	3	4.0
5	ECT-308	Digital Communication	3	2	-	5	75	50	-	125	3	4.0
6	ECT-310	Computer Communication Networks	3	1	-	4	75	50	-	125	3	3.5
7	ECT-312	Digital Communication (Pr)	-	-	2	2	-	50	25	75	3	1.0
8	ECT-314	Electronic Design (Pr)	-	-	3	3	-	50	25	75	3	1.5
9	ECT-316	VHDL (Pr)	-	-	2	2	-	50	25	75	3	1.0
10	ECT-318	Seminar	-	1	-	1	-	25	-	25	-	1.0
Total			18	10	7	35	450	475	75	1000		27.0

NOTE: Students will undergo a practical training of 6 weeks duration after the 6th Semester exam.

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(7 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	-	Open Elective-I	3	1	-	4	75	50	-	125	3	3.5
2	-	Departmental Electives-I	3	2	-	5	75	50	-	125	3	4.0
3	ECT-401	Practical Training Report	-	-	-	-	-	75	-	75	-	3.0
4	ECT-403	Physical Design of Digital IC's	3	2	-	5	75	50	-	125	3	4.0
5	ECT-405	Television & Radar Engineering	3	1	-	4	75	50	-	125	3	3.5
6	ECT-407	Optical Communication	3	2	-	5	75	50	-	125	3	4.0
7	ECT-409	Electronic Switching Systems	3	2	-	5	75	50	-	125	3	4.0
8	ECT-411	Digital Signal Processing (Pr)	-	-	3	3	-	50	25	75	3	1.5
9	ECT-413	Minor Project	-	-	3	3	-	50	25	75	3	4.5
10	ECT-415	Seminar	-	1	-	1	-	25	-	25	-	1.0
Total			18	11	6	35	450	500	50	1000		33.0

Bachelor of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(8 Th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)	Credits
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1	-	Open Elective-II	3	1	-	4	75	50	-	125	3	3.5
2	-	Departmental Electives-II	3	2	-	5	75	50	-	125	3	4.0
3	ECT-402	Comprehensive Viva-Voce	-	-	-	-	-	75	-	75	-	3.0
4	ECT-404	General Fitness & Professional Aptitude	-	-	-	-	-	-	75	75	3	3.0
5	ECT-406	Wireless and Mobile Communication	3	2	-	5	75	50	-	125	3	4.0
6	ECT-408	Transport and Access Technologies	3	2	-	5	75	50	-	125	3	4.0
7	ECT-410	Neuro-Fuzzy Systems	3	2	-	5	75	50	-	125	3	4.0
8	ECT-412	Seminar	-	1	-	1	-	25	-	25	-	1.0
9	ECT-414	Microwave (Pr)	-	-	3	3	-	25	25	50	3	1.5
10	ECT-416	Audio Visual Electronics (Pr)	-	-	3	3	-	25	25	50	3	1.5
11	ECT-418	Major Project	-	-	4	4	-	50	50	100	-	
Total			15	10	10	35	375	450	175	1000		37.5

Master of Technology,(Electronics and Communication Engg.)
Scheme of Courses/Examination
(Ist Semester)

Sl.No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Durat of Exam. (Hours)	Cr.
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1.	MTEC-101	Information & Coding Theory	3	1	-	4	100	50	-	150	3	3.5
2.	MTEC-102	Digital Signal Processing	3	1	-	4	100	50	-	150	3	3.5
3.	MTEC-103	Digital Communication Systems	3	1	-	4	100	50	-	150	3	3.5
4.	MTEC-104	Wireless Mobile Communications	3	1	-	4	100	50	-	150	3	3.5
5.		Elective-I	3	1	-	4	100	50	-	150	3	3.5
6.	MTEC-110	Communication Lab	-	-	3	3	-	50	25	75	3	1.5
7.	MTEC-111	Programming Lab	-	-	3	3	-	50	25	75	3	1.5
						26	500	350	50	900		20.5

Master of Technology,(Electronics and Communication Engg.)
Scheme of Courses/Examination
(2nd Semester)

Sl.No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Durat of Exam. (Hours)	Cr.
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1.	MTEC-201	Telecommunication Networks	3	1	-	4	100	50	-	150	3	3.5
2.	MTEC-202	Optical Communication	3	1	-	4	100	50	-	150	3	3.5
3.	MTEC-203	Modelling and Simulation	3	1	-	4	100	50	-	150	3	3.5
4		Elective-II	3	1	-	4	100	50	-	150	3	3.5
5.	MTEC-209	Simulation Lab.	-	-	3	3	-	50	50	100	3	1.5
6.	MTEC-210	Minor Project	-	-	4	4	-	50	50	100		6.0
			-	-	-	23	400	300	100	800	-	21.5

Master of Technology,(Electronics and Communication Engg.)
Scheme of Courses/Examination
(3rd Semester)

Sl.No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Durat of Exam. (Hours)	Cr.
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1.	MTEC-301	Switching Systems	3	1	-	4	100	50	-	150	3	3.5
2.		Elective-III	3	1	-	4	100	50	-	150	3	3.5
3.		Elective-IV	3	1	-	4	100	50	-	150	3	3.5
4	MTEC-304	Seminar & term paper	-	2	-	2	-	50	-	50	-	1.0
5.	MTEC-311	Data Networks Lab.	-	-	3	3	-	50	50	100	3	1.5
6.	MTEC-312	Hardware Project	-	-	6	6	-	100	100	200	3	9.0
			-	-	-	23	300	350	150	800	-	22.0

Master of Technology,(Electronics and Communication Engg.)
Scheme of Courses/Examination
(4th Semester)

Sl.No	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Durat of Exam. (Hours)	Cr.
			L	T	P/D	Tot	Th	Sess	P/VV	Tot		
1.		Dissertation	-	-	-	-	-	-	S/us	-	-	-

Master of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(1st SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MTEC101	Information & Coding Theory	3	1	-	4	100	50	-	150	3
2	MTEC102	Digital Signal Processing	3	1	-	4	100	50	-	150	3
3	MTEC103	Digital Communication Systems	3	1	-	4	100	50	-	150	3
4	MTEC104	Wireless Mobile Communications	3	1	-	4	100	50	-	150	3
5		Elective I	3	1	-	4	100	50	-	150	3
6	MTEC110	Communication Lab	-	-	3	3	-	50	25	75	3
7	MTEC111	Programming Lab	-	-	3	3	-	50	25	75	3
						26	500	350	50	900	

ELECTIVE I

1.MTEC-106 Statistical Models
2.MTEC-107 Reliability Eng.
3. MTEC-108 Computational Methods
4. MTEC-109 Neuro Fuzzy Systems

Master of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination

(2 nd SEMESTER**)**

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MTEC201	Telecommunication Networks	3	1	-	4	100	50	-	150	3
2	MTEC202	OPTICAL COMMUNICATION	3	1	-	4	100	50	-	150	3
3	MTEC203	MODELING AND SIMULATION	3	1	-	4	100	50	-	150	3
4		ELECTIVE II	3	1	-	4	100	50	-	150	3
5	MTEC209	SIMULATION LAB	-	-	3	3	-	50	50	100	3
6	MTEC210	MINOR PROJECT	-	-	4	4	-	50	50	100	
						23	400	300	100	800	

ELECTIVE II

1. MTEC-205 Multimedia Systems
2. MTEC-206 Satellite & Space Communications
3. MTEC-207 Digital signal processors & Applications
4. MTEC-208 Current trends in Television Technology.

Master of Technology (Electronics and Communication Engg.)

Scheme of Courses/Examination

(3 rd SEMESTER**)**

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1	MTEC301	Switching Systems	3	1	-	4	100	50	-	150	3
2		Elective III	3	1	-	4	100	50	-	150	3
3		Elective IV	3	1	-	4	100	50	-	150	3
4	MTEC 304	Seminar & term paper	-	2	-	2	-	50	-	50	-
5	MTEC311	Data networks Lab	-	-	3	3	-	50	50	100	3
6	MTEC312	Hardware Project	-	-	6	6	-	100	100	200	3
						23	300	350	150	800	

ELECTIVE III

1. MTEC-305 Emerging Network Technologies
2. MTEC-306 CDMA Systems
3. MTEC-307 Advanced Digital Communication Techniques

Elective IV

1. MTEC-308 Object Oriented Programming
2. MTEC-309 RADAR Systems
3. MTEC-310 Image Processing

Master of Technology (Electronics and Communication Engg.)

Scheme of Courses/Examination

(4th SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P/D	Tot	Th	Sess	P/VV	Tot	
1		Dissertation	-	-	-	-	-	-	S/US	-	-

MTEC-101
INFORMATION & CODING THEORY

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1,Basic Concepts of Information Theory**:** A measure of Uncertainty. Binary Sources, Measure of Information for two dimensional discrete finite probability scheme, Noise characteristics of channel, Basic relationship among different entropies, Measure of mutual information channel capacity, Capacity of channel with symmetric noise structure BSC and BEC.
Elements of Encoding**:** Purpose of encoding separable binary codes, Shannon-Fano encoding, Noiseless coding Theorem of decode ability – Mc Millan's Theorem, Average length of encoding message Shannon's Binary encoding, Fundamental Theorem of discrete Noiseless coding, Huffman's Minimum redundancy codes.

Unit-2 Coding for Reliable Digital Transmission & Storage: Introduction, types of codes, Modulation and Demodulation, Maximum likelihood decoding types of error, error control strategies.

Introduction to Algebra**:** Groups, Fields Binary field Arithmetic, Construction of Galois field GF (2m) Basic Properties of Galois Field GF (2m), Vector Spacer, Matrices.

Unit-3, Linear Block Codes: Introduction to Linear Block codes, Syndrome and Error detection Minimum distance of block code, error detecting and Error correcting capabilities a block code, Hamming Code.

Cyclic Codes**:** Description of Cyclic codes, Generator and parity-check matrices of cyclic codes, encoding of cyclic codes syndrome computation & error detection decoding of cyclic codes, Error trapping decoding of cyclic codes, Goley Codes.

Unit-4 BCH Codes: Description of Codes, Decoding of BCH codes, Implementation of Galoes fields Arithmetic, Implementation of error connection.
Convolutional Codes : Encoding of convolution codes, structural properties of Convolution codes, distance properties of Conventional codes, Distance properties of convolution codes, Maximum likelihood decoding of convolution codes.
Automatic Repeat Request Strategies: Stop and wait Go back and selective repeat ARQ strategies, Hybrid ARQ Schemes.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

References:

1. F.M. Reza :Information Theory MC Graw Hill.
2. ShuLin & J Costelb: Error Control Coding. PHI.
3. Dass Mullick & Chatterjee: Principles of Digital Communication. Wiley Eastern

MTEC-102
DIGITAL SIGNAL PROCESSING

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours

Unit-1 Introduction , Discrete time signals and systems, The Z-transform and its application to the analysis of LTI systems, frequency analysis of signals and systems, The discrete fourier transform properties and applications, Fast fourier transform algorithms.

Unit-2 Digital Filters, General considerations, structure for FIR systems, Structures IIR systems, Design of FIR filters, Design of IIR filters, Design of Digital filters based on least squares method.

Unit-3 Multirate digital signal processing, Introduction, Decimation by a factor D, Interpolation by a factor I, Sampling rate conversion by a rational factor I/D, Filter design and Implementation for sampling rate conversion, Multistage Implementation of sampling rate conversion, sampling rate conversion of bandpass signals, Applications of Multirate signal processing.

Unit-4 Adaptive Filtering, Introduction, Applications of Adaptive filters, Stationary discrete time stochastic processes, Winener filter theory, least mean square adaptation algorithm, The exponentially weighted recurrsive least square algorithm (RLS)

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Roman Kuc: Introduction to Digital Signal Processing. MGH.
2. JG Proakis: Digital Signal Processing PHI
3. Oppenheim Schafer: Discrete Time Signal Processing. PHI
4. Simon Haykin, Adaptive Filter Theory, PTH.

MTEC-103
DIGITAL COMMUNICATION SYSTEMS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1 Representation of Bandpass Signal and System Response of a bandpass system to bandpass signal, Representation of bandpass stationary stochastic processes, Representation of digitally modulated signals.

Unit-2 Modulation And Demodulation For The Additive Gaussian Noise Channel**:** representation of signal wave forms and channel characteristics, optimum demodulation for completely known signal in Additive Gaussian Noise-Binary signaling in an AWGN Channel. M-ary orthogonal Signaling in an AWGN channel, Multiphase signaling waveforms, combined multiple phase and multiple amplitude waveforms, Carrier recovery for coherent demodulation.

Optimum demodulation for signals with random phase in additive Gaussian noise, Noncoherent Detection of binary signal in an AWGN channel, Non coherent detection of M-ary orthogonal signal in an AWGN channel.

Unit-3 Digital Signalling Over A Channel With Intersymbol Interference And Additive Gaussian Noise: Signal design for band limited channels, optimum demodulation for ISI and additive white Gaussian noise linear equalization Feedback equalization.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Simon Haykin: Communication System, Wiley Eastern Limited. .
2. J.Dass, SK Mullick & PK Chatterjee: Principle of Digital Communication, Wiley Eastern Limited.
3. Martin S. Roden :Digital and Data Communication System P.H.Inc, London, .
4. Viterbi, A.J. and J.K. Omura :Principles of Digital Communication, Mc-Graw Hill Book Company, New York.

MTEC-104
WIRELESS MOBILE COMMUNICATION

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1. Introduction to mobile radio systems, Paging systems, cordless telephone system, Cellular telephone systems- Cellular concept, frequency reuse, channel assignment strategies, Interference and system capacity, trunking and grade of service, cell splitting, sectoring, microcell zone concept, HO strategies.

Unit 2. Mobile radio propagation: mechanism, free space path loss, log-distance path loss models, Okumara model, Hata model, PCS model, Wideband PCS microcell model, indoor propagation models, Jake's channel model, Multipath characteristics of radio waves, signal fading, Time dispersion, Doppler spread, coherence time LCR, fading statistics, diversity techniques

Unit 3. Introduction to spread spectrum communication, multiple access techniques used in mobile wireless communication: FDMA/TDMA/CDMA, Cellular CDMA, packet radio protocols, CSMA, reservation protocols, capacity of cellular CDMA, soft HO

Unit 4. Wireless systems and standards- GSM standards, signaling and call control, mobility management, location tracing, wireless data networking, packet error modeling on fading channels, Performance analysis of link and transport layer protocols over wireless channels, mobile data networking (mobile IP), wireless data services, IS-95, GPRS

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. W. C. Jakes: Microwave Mobile Communication, IEEE Press
2. T. S. Rappaport : wireless Communications: Principles and practices, Prentice Hall
3. William C. Y. Lee: Mobile Cellular Telecommunications, Analog and Digital Systems, MGH.
4. Kaveh Pahlavan & Allen H. Levesque: Wireless Information Networks, Wiley series in Telecommunications and signal processing.
5. Kamilo Feher: Wireless Digital communications, Modulation and Spread Spectrum Applications. PHI

MTEC-106
STATISTICAL MODELS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1, Random Variables**:** Probability Bay's rule, Distribution function, Discrete random vectors, different distributions, jointly distributed random variables, order statistics, Distribution of sums, expectations, moments, transform methods mean time to failure, Inequalities and limit theorems, Mixture distribution, Conditional expectations, Imperfect fault coverage & reliability, Random Sums.

Unit-2, Stochastic Process: Classification Bernoulli process, Poisson process, Renewal Processes, available analysis, Random incidence, Renewal model of program behavior.

Unit-3, MarkovChains: n-step transition probabilities, limiting distribution, Distribution of times between state changes, Irreducible finite chains with a periodic states, The M/g/I, Queuing System Discrete parameter, Birth Death Processes, Markov chains with absorbing states. Birth and death Processes, Non Birth Death Processes.

Unit-4, Network of Queues: Open and close queuing networks, Non exponential service time distributions and multiple job type, non-product form networks.

Correlation & Regression: Introduction, Least squares curve fitting. Coefficient of determination, Confidence of intervals in linear regression, correlation analysis, Non-linear regression, Analysis of variance.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. K.S. Trivedi :Probability and Statistics, PHI.

MTEC-107
RELIABILITY ENGINEERING

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1, 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 0failures, Reliability measures, Derivation for exponential distribution function, other kinds of distributions, Binomial, Poisson uniform, Rayleigh, Weibull, Gamma distributions, Markov chains, failures data analysis.

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.

Unit-2, Reliability Prediction: Objective of reliability Prediction, Classification, information sources for failure rate data, prediction methodologies, general requirement, role and limitations of reliability prediction.

Unit-3, Reliability Allocation: Subsystems reliability improvement, Apportionment for new units, criticality.

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.

Unit-4, Reliability Testing: Kinds of testing, component reliability measurements parametric methods, confidence limits, accelerate testing, equipment acceptance testing.

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

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

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. KK Aggarwal : Reliability Engineering, Kluwer Academic Netherlands.
2. KB Mishra : Reliability Prediction & Analysis : A Methodology Oriented Treatment, Elseveir, Netherlands
3. B Singh: Quality Control and Reliability Analysis, Khanna Publishers.

MTEC-108
COMPUTATIONAL METHODS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: computational complexity, Error analysis in science and engineering, Fourier series, Fourier integral, example of transforms and orthogonal polynomials, Time series calculation of power spectra, convolution and correlation using FFTs, Introduction to wavelets.

Unit 2: Evaluation of integrals, Elementary Analytical methods, Trapezoidal and Simpson's rules, Summation of series, Gaussian Quadrature and orthogonal l polynomials, Multidimensional integrals.

Unit 3: Ordinary differential equations, solution in closed form, Power series methods, approximate methods, Predictor and corrector methods, Numerical differentiation, and estimation of errors, extremisation of functions, optimization and simple search, simplex method of Nelder and Mend, Gradient based method, Finite elements method.

Unit 4: Vectors and matrices, solution of linear and algebraic equations by direct and iterative methods, Gaussian elimination, minimal residual and conjugate gradient methods, preconditioning techniques

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES;

1. Kreyszig F: Advanced Engineering Mathematics, John Wiley
2. C.F.Gerald & P.O. Wheatley: Applied Numerical Analysis, Pearson Education Asia,

MTEC-109
NEURO FUZZY SYSTEMS

L T P.
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1,Introduction: Fuzzy and Neurofuzzy system. Merits of Fuzzy and Neurofuzzy systems. Introduction to Architecture of a fuzzy system. Fuzzzification Rule Base, Interface engine, Defuzzification.

Fuzzy Mathematics: Fuzzy sets & operation of fuzzy sets. Properties of fuzzy sets. Fuzzy relations. Fuzzy graphs & Fuzzy Arithmetic.

Unit-2, Architecture & Design Issues: Fuzzification. Fuzzy Rule based and fuzzy rule based Models. Implication process, Defuzzification Techniques.

Fuzzy Logic in Control Applications: Selection of Design Methodology, Technical Design objectives, Development of Plant Model. Control Design, Mamdani & Sugeno – Takagi Architectures.

Unit-3,Analog Design of Fuzzy Processors: Modular design. Design of a Fuzzifier, knowledge base and inference engine. Defuzzifier design.

Implementation of a Complete Analog Fuzzy System: Digital and Microprocessor based implementations of Fuzzy Systems.

Unit-4, Fuzzy Model Identification: Structure Specifications, Parameter estimation, Model Validation.

Neuro Fuzzy Systems: Introduction to neural networks. Neurofuzzy Architecture, Learning Methodologies.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. KLIR & YAUN : Fuzzy Sets and Fuzzy Logic, Prentice Hall of India,

MTEC-201
TELECOMMUNICATION NETWORKS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

UNIT1: Issues in the transport of data traffic over networks of digital transmission media, types of networks, transmission media, Architectural concepts in ISO's OSI layered model for computer communication, Physical Layer standards, Data link layer, ARQ schemes and their analysis, Delay models based on queuing theory, network layer, topology, routing, flow control, congestion control,

UNIT2: TCP/IP: Architecture, The Internet protocols, IP Packet, IP addressing, IP routing, CIDR, Address resolution, Fragmentation and reassembly, ICMP, IPv6-headers Network addressing, UDP, TCP, DHCP and mobile IP, Internet routing protocols-open shortest path, Border Gateway protocol, Multicast routing protocols, TELNET and FTP, configuration and administration basics, DNS, NFS, APS

UNIT3: Poisson process, Markov chain, M/M/1, and variantsM/G/1 reservation priority, multiple access in networks, random access p-ALOHA, s-ALOHA, CSMA, CSMA/CD, Ethernet, Token ring, Token bus, FDDI, routing, virtual circuit, Datagram, flooding, broadcasting,

UNIT4: Internetworking-connection mode network service, x.75 internetworking, networks through ISDN, internetworking SNA, and x.25, the x.300 internetworking standards, Personal computer networking, data transmission in PSTN, Data network standards, voice -data integration, fast packet switches.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES;

1. Andrew S. Tanenbaum: Computer networks, PHI.
2. Thiagarajan Viswanthan: Telecommunication switching Systems and networks, PHI .
3. W. Stallings: Data and computer communications, MC, Milan
4. Alberto Leon-Garcia, Indra Widjaja: Communication networks, fundamental concepts and key architecture, TATA McGraw Hill.
5. Bertsekas D. and Gallager R.: Data Networks, PHI.
6. Keshav S: An Engineering Approach to computer Networking, Addison Wesley .

MTEC-202
OPTICAL COMMUNICATION

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1, Introduction: Advantage of optical fiber communication, Types of fibres, Numerical Aperture.

Optical filters: Attenuation, Absorption, Linear and non-linear scattering losses, Dispersion, overall fiber dispersion, polarization, fiber bending losses,.

Unit-2, Fiber Optic cables, Fiber optic splices, Connectors and Couplers, Devices for WDM Fibre Optic Test Methods, Power Measurements, Optical Time Domain, Reflectometry,

Unit-3, Optical Sources: Basic concepts: LED for Optical Communication, Burrus type double hetro structure, Surface emitting LEDs, Shape geometry, Edge emitting LEDs, LED to fiber launch systems semiconductor Lasers Theory, modulation and characteristics, Fabry-Perot lasers quantum well lasers and distributed feedback lasers.

Photo Detectors: P-I-N Photo diodes: Theory and their characteristics, Avalanche Photo diode detectors, Theory and their bandwidth Noise in APD.

Unit-4, Optical Fiber Communication Systems: Optical transmitter circuit: LED and laser drive circuits, Optical receiver circuit; structure, Preamplifier, AGC, equalization, Optical power budgeting line loading., Analog systems ; analog modulation, Direct modulation, Sub carrier modulation, Distribution system, optical TDM subcarrier multiplexing, WDM.

Coherent Systems: Coherent receivers; homodyne and heterodyne detection, noise in coherent receiver, Polarization control, Homodyne receiver, reusability and laser linewidth, Heterodyne receiver, Synchronous, Asynchronous and self synchronous demodulation, Phase diversity receivers

.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. John Gewer: Optical Communication Systems, PHI.
2. Gerd Keiser: Optical Fiber Communication . Tata MGH
3. John Powers, An Introduction to Fibre Optic Systems, Irwin McGH.
4. Frederick C Allarad, Fibre Optics Handbook for Engineers & Scientists, McGH.

MTEC-203
MODELING AND SIMULATION

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

UNIT1: Systems, Models and simulation, continuous and discrete, static and dynamic, deterministic and stochastic systems, discrete event simulation, time advance mechanisms, continuous simulation, Monte Carlo simulation modeling of complex systems, advantages and disadvantages, weaknesses of computer simulation, area of application.

UNIT2: Probability and statistics mean, variance, probability distribution, random number generation, methods of generating random variates, inverse transforms, discrete random variates, generating correlated random numbers.

UNIT3: Queuing models: single server and multiple server systems, arrival and departure patterns, theoretical results for some queuing systems.

UNIT4: Matlab environment, programming, modeling, with matrices, simulation in Matlab, introduction to dynamic system simulation using SIMULINK, applications of simulink, Validation, Verification techniques, statistical methods for verification, confidence interval approach, time series approach, output data analysis.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Banks J. Carson J.S. and Nelson B: Discrete Event system simulation, PHI.
2. Celler F. E.: Continuous system simulation, Springer verlag
3. Athanasios Papoulis: Probability Random variables and Statistics Processes, Mc Graw Hill.
4. Reference manual & user's guide on Matlab

MTEC-205
MULTIMEDIA SYSTEMS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1,Concept of Multimedia, Emerging Applications, Multimedia Systems and Appliances. Distributed Multimedia Systems, Synchronization, Orchestrtion and QoS Architecture standards.

Unit-2, Digital audio representation and processing – Audio in computer applications, its digital representation, transmission and digital processing, speech recognition and generation.
Digital video and image compression – video compression techniques and standardization of algorithms, JPEG, MPEG, DVI technology.

Unit-3, Multimedia Information Systems – Workstation OS, New OS support, Real Time Mach, Multimedia system service architecture, Media Stream Protocol, service and window system, client control of continuous media, Hyperapplications.
Multimedia Information systems, File system support, Data Models.

Unit-4, Multimedia communication systems – public Network services and N/W Protocols, Quick time Movie File (QMF), format, OMFI, MHEG, Format function Real time Interchange, Track Model and Object Model Teleconferencing systems, Shared Amlication Architectures, Embedded Distributed objects, Multimedia conferencing architecture, architecture of team workstation.
Multimedia and Internet. The internet, client server technology, Communication Protocols, Internet Addressing, WWW, HTML, and Web Authoriting, Web page browsers and development, bandwidth and applications considerations, Design Considerations for Web Pages, Accessing content on internet.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. John F. Koegel Bufod: Multimedia Systems, Addison Wesley, Edition.
2. David Hillman: Multimedia Technology and Application, Galgotia Publications

MTEC-206
SATELLITE AND SPACE COMMUNICATION

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1, Introduction: Satellite communication, Brief History.

Orbits of satellite: Low, medium and Geo synchronous main characteristics, Angle period, Returning period, Angle of Evaluation, Propagation Delay, Orbital Spacing.

Unit-2, Satellite Links: Delay transponders, Earth Stations, Antennas and Earth coverage, Altitude and eclipses.

Earth space propagation effects: Frequency window, Free space loss, Atmospheric absorption, Rainfall Attenuation, Lonospheric scintillation, Telemetry, Tracking and command of satellites.

Unit-3, Detection**:** QPSK offset QPSK and MSK. Coherent and non-coherent detection, Error rate performance.

Unit-4, Synchronization: Principle and techniques, Multiple Access Techniques, FDMA, SPADE system, TDMA system, concept and configuration, system timing frames format, SSMA-Basu Principles, VSAT, Random access, space communication, link design description of operational in TELSAT and INSAT system.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. J. Martin: Communication Satellite System ,PH Englewood.
2. D.C.Aggarwal :Satellite Communication,Khanna Publishers.
3. Tri Ha Digital Satellite Communication Tata Mc Graw Hill.
4. Harry and Vam Trees: Satellite Communication ,IEEE Proceedings, 1979.

MTEC-207
DIGITAL SIGNAL PROCESSORS AND APPLICATIONS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

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

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

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

TMS – 320 Architecture, and Instruction Set.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Mohammed EL. Sharkawy: Digital Signal Processor Applications with Motorola's DSP 56002. P.H. PTR.

MTEC-208
CURRENT TRENDS IN TELEVISION ENGINEERING.

L T P.
3 1 0

Exam :100
Sessionals:50
Time :3 Hrs.

Unit-1, Introduction, Elements of Colour TV, Comparison of NTSC, PAL, SECAM, Systems, Broad Diagram Approach of NTSC, PAL and SECAM transmitters and receivers,

Unit-2, Projection TV System, Projection Tube System, Light Modulator Systems, Laser TV Projectors, Lens system for projection TV, Picture tube for Video Projectors, 3-D TV, Stereoscopic effect, transmission of 3-D TV signal, Cable television, block converter cable connections.

Unit-3, High definition TV, Digital TV, Satellite TV, Block diagram approach, Computerized TV

Unit-4, Video Camera, Camcorders, VTR, video disc, Tele text and View data.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. S.P. Bali, Colour Television Theory and Practice, TMH.
2. R.L. Goodman, Maintaining and Repairing of VCRs, McGH.
3. R.R. Gulati, Monochrome and Colour TV, Wiley Eastern. Ltd.

MTEC-301
SWITCHING SYSTEMS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: **Introduction: Basic line circuits in telephony and telegraphy; long-haul communication circuits; statistical bandwidth sharing, principles of traffic switching, & signaling: schemes, CCS7.**

Unit 2: Review: Strowger's and crossbar switches; switching system hierarchy, SPC switching, basic call processing, Level 1, 2 & 3 controls, interface controller, network control processor, central processor, switching fabric-SDS, TDS, STS, TST, TTT, single stage and multi-stage switching network, principles of large-scale, switch design.

Unit 3: Traffic Engineering and Teletraffic Theory: Markov processes representing traffic, calculation of blocking probability, stationary probability measures for Ergodic Markov processes, combinatorial interpretation, calculation of blocking probability.

Unit 4: **Switching Network Control and management, data networks and protocols, ISDN, Message Handling systems/intelligent networks, multiservice broadband switching fabrics- ATM., current trends in digital switching systems.**

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Thiagarajan Viswanathan : Telecommunication Switching Systems and Networks, PHI
2. Syed Riffat Ali: Digital switching Systems, system reliability and analysis, Tata MC Graw,
3. Keshav S: An Engineering Approach to Computer Network Networking, Addison Wesley,

MTEC-305
EMERGING NETWORK TECHNOLOGIES

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: **Foundations: virtual circuits, PVC, SVC, SPVC, connection oriented and connectionless systems, variable bit rate and constant bit rate applications, flow control and connection management, addressing and identification schemes, multiplexing methodologies, network interface.**
Unit 2: T1/E1 CARRIER systems, topology, X.25, layers, PDUs, ISDN- typical topology, layers, and PDUs, SS7, FDDI, Frame relay, standards, topology, layers, OSI and ANSI layers, frame relay protocol data unit Frame relay network to network interface.
Unit3: Fast and switched Ethernet: generation of LANs, switched Ethernet, architecture, store and forward and Cut through switches, virtual LAN, Fast Ethernet, 100BASET.
Unit4: ATM standards, topology, VPI and VCI Labels, ATM layers, ATM and B-ISDN model, cells, ATM switching, AAL types, traffic management in ATM network, SONET/ SDH: synchronous networks, standards, topology, automatic protection switching, multiplexing structure, payloads and envelopes, payload pointers, Introduction to broad band signaling networks.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Behrouz Forouzan: Introduction to Data Communication and Networking, Tata Mc-Graw hill
2. Uyless Black: Emerging Communication Technologies, 2nd Ed, Prentice hall
3. Sumit Kasera and Pankaj Sethi: ATM Networks, Concepts and Protocols, Tata Mc-GrawHill

MTEC-306
CDMA SYSTEMS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: Direct sequence and frequency hopped spread spectrum, spreading sequence and their correlation functions, Acquisition and tracking of spread spectrum signals.

Unit 2: Error probability for DS-CDMA, on AWGN channels, DS-CDMA on frequency selective fading channels, Performance analysis of cellular CDMA.

Unit 3: Capacity estimation, Power control, effect of imperfect power control on DS CDMA performance, Soft Handoffs.

Unit 4: Spreading /coding tradeoffs, multicarrier CDMA, IS-95 CDMA system, third generation CDMA systems, multi-user detection.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Andrew J. Viterbi: CDMA Principles of spread spectrum communications, Addison Wesley
2. J.S. Lee and L.E. Miller: CDMA system Engineering handbook, Artech house

MTEC-307
ADVANCED DIGITAL COMMUNICATION TECHNIQUES

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: Vector quantization, sub band coding of speech, audio and video signals, linear predictive coding of speech, CELP coders, and MPEG standards for audio and video.

Unit 2: Characterization of band pass signals, and systems, orthonormal expansion of signals, representation of digitally modulated signals, non linear modulation methods, with memory, optimum demodulation for known signals in additive Gaussian noise.

Unit 3: Probability of error for binary and M-ary signaling, DPSK demodulator, carrier and symbol synchronization techniques, characterization of band limited channels and ISI, signal design for zero ISI, and controlled ISI, optimum demodulator, for ISI, and AWGN.

Unit 4: Linear equalization and decision feedback, equalization, adaptive equalize, fading dispersion channels, and tapped delay line moseloptimum demodulation for binary sgnalsover fading disperse channels, RAKE recover.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Proakis, J.G.: Digital Communication, Mc Graw hill
2. Haykin, S.: Digital Communication, Wiley.

MTEC-308
OBJECT ORIENTED PROGRAMMING

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: Object orientation concepts of abstract data types, data hiding and classes, advantages of OOP, C++ and other OOP languages, Programming construction, input –output, basic data types, operator and expressions, control structures, functions, argument passing, returning values.

Unit 2: Class declarations, member functions, objects as function arguments constructors, operator over loading and its use, inheritance, derived and base classes, class hierarchies, polymorphism, programming examples, implementation of linked structures-lists stacks, queues and trees, use of templates, for generalized structures.

Unit 3: Object modeling, properties of object, relationship among objects-links and aggregation, relationship among classes, multiple inheritance, matacleass, interplay of classes and objects, building quality classes, and objects, concepts of foundation class library.

Unit 4: Visual C++ compiler package generic concepts, and tools, windows, programming through foundation class library, case study of writing a foundation class library application.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Schildt: C++ The Complete Reference, TMH.
2. Lafore : Object Oriented Programming using C++, Galgotia Pub.

MTEC-309
RADAR SYSTEMS

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit 1: Overview of CW and Frequency- modulated radar, MTI and pulse Doppler radar, Tracking radar.

Unit 2: Radar transmitters-magnetron oscillator, klystron amplifier, TWT amplifier, crossed field amplifiers, grid controlled tubes, Radar receivers- mixers, low noise front ends, displays, duplexers and receiver protectors.

Unit 3: Electronically steered phased array antenna in radar- phase shifters, frequency scan arrays, array elements, feeds for arrays, simultaneous multiple beams from array antennas, computer control of phased array radar.

Unit 4: Detection of radar signals noise-matched filter receiver, Correlation detection, Detection criterion, Automatic detection, Constant false alarm rate receiver, Synthetic Aperture radar, Height finder and 3-D radars, Electronic Counters-Countermeasures, Bistatic radar.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES

1. Merill I. Skolnik: Introduction to Radar systems, 2nd ed. McGraw-Hill.

MTEC-310
IMAGE PROCESSING

L T P
3 1 0

Exams :100
Sessionals :50
Time :3 Hours.

Unit-1, Introduction: Elements of Digital Image Processing Systems, Image Acquisition, Storage, Processing Communication Display.

Digital Image Fundamentals: Visual Perception, simple image models, concept of uniform and non-uniform sampling & quantisation, Relationships between pixels-neighbours of pixel, connectivity labeling of connected components. Relations, equivalence and Transitive closuer, Distance measures, Arithmetic/ Logic operation, Imaging Geometry Basic and perspective transformation stereo imaging.

Unit-2, Image Transforms: Discrete Fourier transform, 2-D Fourier Transforms and its properties. Fast Fourier transform and its uses. Walsh, Hadamard Discret cosine, Haar and slant transforms hotelling their algorithms and computer implementations.

Image Enhancement: Spatial and frequency domain methods point processing, intensity transformation, Histogram processing image substation and Averaging spatial filtering, LP, HP and homomorphic felling, generation of spatial marks, Colour image processing.

Unit-3, Image Restoration: Degradation model, diagonalization of circulate and block circulate metrics, Algebraic approved invoice filterning, wiener filter, constrained least square restoration, Interative restoration in spatial domain geometric transformation.

Image Compression: Redundancy modles, error free compression, Lossy compression, Image compression standards.

Unit-4, Image Segmentation : Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation use of motion in segmentation.

Representation and Description: Image analysis, Pattern and their classes, Decision theoretical methods, Structural methods, Interpretation.

Note: Eight questions will be set and the students will be asked to attempt any five questions.

REFERENCES:

1. Anil K.Jain: Fundamentals of "Digital Image Processing " PHI .
2. Rafael C.Gonzalez, Richard E.Woods: Digital Image Processing, Addison Wisley Publishing Company

Master of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(1st SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)	
			L	T	P/ D	Tot	Th	Sess	P/VV	Tot		
1	MTEC101	Information & Coding Theory	3	1	-	4	100	50	-	150	3	
2	MTEC102	Digital Signal Processing	3	1	-	4	100	50	-	150	3	
3	MTEC103	Digital Communication Systems	3	1	-	4	100	50	-	150	3	
4	MTEC104	Wireless Mobile Communications	3	1	-	4	100	50	-	150	3	
5		Elective I	3	1	-	4	100	50	-	150	3	
6	MTEC110	Communication Lab	-	-	3	3	-	50	25	75	3	
7	MTEC111	Programming Lab	-	-	3	3	-	50	25	75	3	
						26	500	350	50	900		

Master of Technology (Electronics and Communication Engg.)
Scheme of Courses/Examination
(2 nd SEMESTER)

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)	
			L	T	P/ D	Tot	Th	Sess	P/VV	Tot		
1	MTEC201	Telecommunication Networks	3	1	-	4	100	50	-	150	3	
2	MTEC202	OPTICAL COMMUNICATION	3	1	-	4	100	50	-	150	3	
3	MTEC203	MODELING AND SIMULATION	3	1	-	4	100	50	-	150	3	
4		ELECTIVE II	3	1	-	4	100	50	-	150	3	
5	MTEC209	SIMULATION LAB	-	-	3	3	-	50	50	100	3	
6	MTEC210	MINOR PROJECT	-	-	4	4	-	50	50	100		
						23	400	300	100	800		

Master of Technology (Electronics and Communication Engg.)

Scheme of Courses/Examination

(3 rd SEMESTER**)**

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratn. of Exam (Hours)	
			L	T	P/ D	Tot	Th	Sess	P/VV	Tot		
1	MTEC301	Switching Systems	3	1	-	4	100	50	-	150	3	
2		Elective III	3	1	-	4	100	50	-	150	3	
3		Elective IV	3	1	-	4	100	50	-	150	3	
4	MTEC 304	Seminar & term paper	-	2	-	2	-	50	-	50	-	
5	MTEC311	Data networks Lab	-	-	3	3	-	50	50	100	3	
6	MTEC312	Hardware Project	-	-	6	6	-	100	100	200	3	
						23	300	350	150	800		

Master of Technology (Electronics and Communication Engg.)

Scheme of Courses/Examination

(4th SEMESTER**)**

Sl. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duratio n of Exam (Hours)	
			L	T	P/ D	Tot	Th	Sess	P/VV	Tot		
1		Dissertation	-	-	-	-	-	-	S/US	-	-	