Price:- 10/- Rs.

॥ अंतरी पेटवू ज्ञानज्योत ॥

North Maharashtra University, Jalgaon

Syllabus for Forth Year Engineering Degree Course (B.E.)

ELECTRONICS & TELECOMMUNICATION

w.e.f. July,2001

C:\ENGINEERING\COVERPAGE.doc\PRAMOD CHAVAN

NORTH MAHARASHTRA UNIVERSITY, JALGAON
B.E. (ELECTRONICS AND TELECOMMUNICATION)
(1998 Course)
With Effect From Academic Year 2000-2001
TERM - I

Subject Code	Subject	Teaching Scheme Hours/Week		Examination Scheme				
		Lectures	Practical	Paper duration Hours	Maximum Marks			
					Paper	Term work	Practical **	Oral
	Elective - I *	4	2	3	100	25	25	-
	Communication system - II	4	2	3	100	25	25	-
	Radiation and Microwave Techniques	4	2	3	100	25	25	-
	Digital Signal Processing	4	2	3	100	25	-	-
	Seminar	-	2	-	-	-	-	50
	Project Work	-	4	-	-	50	-	-
	Total	16	14	-	400	150	75	50
	Grand Total	30		-	675			

* Elective - I a) System Programming
b) Television Engineering
c) VLSI Design
d) Bio-Medical Instrumentation

** Note - Practical examination will be of three hours duration. It will consist of one experiment out of the list of experiments specified. Panel of 2 examiners appointed by university authority shall assess practical examination.

NORTH MAHARASHTRA UNIVERSITY, JALGAON
B.E. (ELECTRONICS AND TELECOMMUNICATION)
(1998 Course)
With Effect From Academic Year 2000-2001
TERM - II

Subject Code	Subject	Teaching Scheme Hours/Week		Examination Scheme				
		Lectures	Practicals	Paper duration Hours	Maximum Marks			
					Paper	Term work	Practical **	Oral
	Elective - II *	4	2	3	100	25	25	-
	Telematics	4	2	3	100	25	-	-
	Consumer Electronics	4	2	3	100	25	25	-
	Electronic Measurement	4	2	3	100	25	25	-
	Technical Visit	-	-	-	-	50	-	-
	Project Work	-	4	-	-	50	-	50
	Total	16	12	-	400	200	75	50
	Grand Total	28		-	725			

Total Marks of Term I + II = 1400

* Elective - II a) Computer Communication
b) Optical Fibre Communication
c) Digital Image Processing
d) Information Technology

** Note - Practical examination will be of three hours duration. It will consist of one experiment out of the list of experiments specified. Panel of 2 examiners appointed by university authority shall assess practical examination.

B.E. ELECTRONICS & TELECOMMUNICATION ENGINEERING

TERM - I **Elective - I**

System Programming

TEACHING SCHEME :

Lecturers 4 Hrs/Week
Practical 2 Hrs /Week

EXAM SCHEME :

Paper 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT - I **(20 Marks, 10 Hrs)**

Computer System
Features of 80X86, Features of Pentium Processor, Superscalar structure Flags, Pipeline, Register structure
Operating modes - Real mode, Protected mode, Segment Selectors, Segment Descriptors, Privilege Level, Descriptor tables, Virtual mode.

UNIT - II **(20 Marks, 10 Hrs)**

Data structure
Stack Array, Queue, List data structure
Sorting techniques, Linear & Binary search
Booting process, BIOS

Pre-processor & Macro-processor
Concept and comparison between pre-processor and macro-processor, Macro-processing Algorithm flow chart and Macro assembler.

UNIT III **(20 Marks, 10 Hrs)**

System software
Linker and loader
Allocation, relocation, linking loading, various schemes of linking and loading.
Concept of binding, static and dynamic binding static and dynamic linking. Different linking strategies. Absolute and re-locatable loaders Dynamic linkage .COM and .EXE files.

Assembler and compiler.
1 pass and 2 pass assemblers, algorithm, flow chart.
7 stages of compiler model.

UNIT IV **(20 Marks, 10 Hrs)**

Operating system
Functions, Types - Batches - Interactive, Single user - Multi-user, Multitasking, Timesharing, Real-time.
Processor Management Concept of process, process states, process state transitions, process control block, operations on processes, deadlocks, scheduling levels, scheduling criteria.
Memory management.
Concepts of Multi-programming, Paging, Segmentation, Virtual storage management strategies, Swapping definitions and algorithms.

UNIT V **(20 Marks, 10 Hrs)**

Case study
DOS : Fundamentals of DOS Batch Files, configuration files in DOS, DOS shell, DOS utilities, Processor, memory and device management as implemented in DOS.

Windows : GUI, File management and memory management under Windows.

Software tools Editors, Symbolic debuggers.

Reference books :

1 System Programming	John Donovan
2 Introduction to system software	D.M. Dhamdhere
3 Operating system concept	Peterson
4 System Software	Leland L. Beck
5 System Software tools.	Ted J. Biggerstaff.
6 Operating system	Tanenbaum
7 Advanced MS DOS programming	Ray N. Duncon
8 The Indispensable Pentium	Hans Peter Meanmer Addison Wesely
9 MS DOS user's Guide	Microsoft Inc.

TERM WORK :

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Assembly language programming for 80 x 86 micor processors [Any two].
2 Implementation of stack/queue using linked list data structure in C/C++.
3 Implementation of any one application of single & two dimentional array in C/C++.
4 Implementation of sorting methods [any two] in C/C++.
5 Implementation of searching methods (linear & binary search) in C/C++.
6 Design of macro processor [nested macro calls within definition] in C/C++.
7 Design of 2 pass assembler for hypotetical machine or 8085 microprocessor in C/C++.
8 Design of vertical analyser for subset of C by using C/C++.
9 Design of parser for a subset of C by using C/C++.
10 Design of Line/screen editor in C/C++.
11 Study of application of batch file.
12 Study of various DOS interrupts.
13 Study of various features of windows operating system.

TERM - I

Elective - I

VLSI. Design

TEACHING SCHEME :

Lectures 4 Hrs/Week
Practical 2 Hrs/Week

EXAM SCHEME :

Paper 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT I (20 Marks, 10 Hrs)

History of IC design, Introduction to ASIC, Different types of ASIC.

Introduction to VHDL ASIC design flow, features of VHDL Overview of design automation approach of digital design. Use of H/W Description Logic. Digital system simulation.

VHDL structure, entry, architecture, language element, library, concurrent statement, sequential statement, subprogram, package, attributes, structure specification of H/W wiring & component interconnection.

UNIT II (20 Marks, 10 Hrs)

Behavioural modelling of VHDL. Definition and usage of packages and components. Design of a general purpose test bench. Use of design libraries and library management. Introduction to library STD logic 1164 and motivated logic. Behavioural description of H/W system and semantics for various forms and constructs.

UNIT III (20 Marks, 10 Hrs)

Synthesis and design implementation, Synthesis Vs simulation, Synthesis design flow, Synthesis process, advantages, tools, features and optimisation in VHDL, H/W modelling techniques. Case studies using download facilities at minimum 4MHz, into CPLD 9500 series and FPGA 5200 or 4000 series with seven 7 segment display on board to verify results.

Architecture of FPGA and CPLD such as Xilinux 9500 series CPLD and 5200 or 4000 series FPGA.

UNIV IV (20 Marks, 10 Hrs)

Finite state machines

Synchronous FSM, state machine concept, sequential logic, algorithmic state machine representation, FSM design procedure, State machine design technique and VHDL state vector encoding, FSM reduction method, Handling illegal style Moore and Mealy machine, Timing, PLA, EPROM, CPLD and FPGA.

UNIT V (20 Marks, 10 Hrs)

Advanced Topics :

Information on a complete tool form design entry to place and route.
Introduction to various industry standard tools used for simulation and synthesis.

Design Issues :

Digital MOS IC,s. D.C. analysis of Inverter/Basic gates, concept of minimum logic levels, noise margins and delay calculations.

Design for Testability

1) Combinational Design Testing
2) Scan Test
3) BIST
4) JTAG
5) Boundary Scannin

Reference Books :

1 Digital design- M. Morris Mano-2nd edition EEE-PHI.
2 VHDL : Douglas Perry-3rd edition-MGH.
3 VHDL Analysis and Modelling of Digital systems- Z. Navabi-McGraw Hill-2nd edition.
4 VHDL : Techniques, Experiments & Caveats- Joseph Pick-McGraw Hill.
5 Principles of CMOS VLSI design- Neil and Kamran-Addison Wesley.
6 Xilinx Manual.
7 VHDL primer Jairam Bhaskar

TERM WORK :

Term work will consist of record of at least 8 experiments performed by students from the following.

Experiments Based On Combinational Logic :

1. Simulation and Implementation of BCD to 7-Segment Display Decoder.
2. Simulation and Implementation of Magnitude Comparators.
3. Simulation and Implementation of 2-line to 4-line Decoder or Multiplexer and Demultiplexer.
4. Simulation and Implementation of ALU with minimum 4 - Arithmetic/Logical operation (e.g. IC 74181).

Experiments Based on Sequential logic .

5. Simulation and implementation of Latches and Registers with Reset and clear.
6. Simulation and implementation of Counters.
7. Simulation and implementation of Shift Registers.

Complex & advanced Experiments

8. Simulation and implementation of Functionally of 8253 (Programmable Timer).
9. Simulation and implementation of Functionally of 8255 (PPI).
10. Simulation and implementation of a Bit programmable input/output,(6821).

TERM - I

Elective - I

Television Engineering

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 2 Hrs/week

EXAM SCHEME :

Paper 100 marks
Practical 25 marks
Term Work 25 marks

UNIT I **(20 Marks, 10 Hrs)**

Basic Television System, scanning principles, signal transmission and Band Width :
Sound and picture transmission, sound and picture reception, synchronisation, Basic T.V. signals brightness, perception, flicker, scanning vertical resolution, kell factor, Horizontal resolution, video band width, interlaced scanning, composite video signal, video modulation, VSB reception T.V. standards, standard channels, characteristics and standards, colour T.V. signal, composite colour T.V. signal, NTSC, SECAM, PAL system.

UNIT II **(20 Marks ,10 Hrs)**

a) Camera Tubes : Basic principle, image orthicon vidicon. The plumbicon, staticon, new vicon silicon diode array vidicon, solid state image scanner, comparison of T.V. cameras, Colour T.V. cameras.
b) Monochrome and Colour T.V. Picture Tube : Construction, operation characteristics and circuit controls.

UNIT III **(20 Marks, 10 Hrs)**

a) **T.V. Transmission and Relay System**

Requirement of T.V. broadcast Transmission, Block diagram of T.V. Transmitter visual Exciter, Aural Exciter, Diplexer, Transmitting antennas, Micro-wave T.V. relay system.
Radio wave character propagation phenomena, space wave propagation, Line of sight range, space wave reception over smooth terrain, DX reception shadow zones, Co-channel interference Ghost images, Interference problem.

b) T.V. Antenna Systems :

Antenna Requirements, Resonant Antennas and their Characteristics, Folded Dipole, Parasitic Elements, Yagi Aerials, Antenna Feeders, Impedance Matching, Television Signal Booster Amplifiers, Shared Antenna Systems Parabolic antenna.

UNIT IV **(20 Marks, 10 Hrs)**

T.V. Receivers :

Colour T.V. signal, composite colour T.V. signal, NTSC, SECAM, PAL system.
Study of various stage of B/W and colour T.V. receiver Tuner, VIF, SIF, Detector, Video amplifier, Sound Section, Keyed AGC, Sync. Separator, Horizontal Section, Vertical Section Power Supply, SMPS, Remote Control, Chroma Section, Picture Tube Circuit.
Note : Detailed Circuit of SIF , Sound Section, power supply, SMPS not required.

UNIT V **(20 Marks, 10 Hrs)**

a) **Advanced T.V. Systems :** Fully digital Television System, Transmission of digital T.V. signal, Digital T.V. receiver High Definition T.V. System, 3D - stereophonic T.V. techniques.
b) **T.V. Applications :** T.V. Via Satellite Cable Television, Closed Circuit Television, Theatre Television, Picture Phone and Facsimile, Video Tape Recording, T.V. Games D.T.H service.

Reference Books

1) Television and Video Engineering - A.M. Dhake
2) Monochrome and Colour Television - R.R. Gulati
3) T.V. & Video System - Grob

TERM WORK :

Term work will consist of record of at least 8 experiments performed by students from the following.

1) Study of T.V. Receiver.
2) Measurement of Voltages in T.V. Receiver (Two Expt)
3) * Tracing circuit of various stage of T.V. Receiver. (Two Expt)
4) * Fault finding in T.V. Receiver. (Two Expt)
5) * Measurement of gain of Booster/Line Amplifier.
6) Plotting directional pattern of yagi Antenna.
7) Alignment of T.V. Receiver.
8) Alignment of picture tube components.
9) Study of T.V. Projection System.

* Different Experiments shall be performed on the different stages

TERM - I **Elective - I**

Bio-Medical Instrumentation

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 2 Hrs/week

EXAM SCHEME :

Theory 100 marks
Practical 25 marks
Term Work 25 marks

UNIT - I **(20 Marks, 10 Hrs)**

Introduction to gross anatomy of human body, major physiological systems, their structure and function. Cell structure, basic cell functions, origin of bio-paternials, electrical activity of cells (electro physiology) Introduction to bio-medical instruments, classification justification.

UNIT - II **(20 Marks, 10 Hrs)**

Transducers for bio-medical instrumentation and selection bio-medical electrodes.
Cardiological System : Structure of heart, rhythmicity, cardiac cycle, heart sounds, cardiac output, blood pressure measurement direct indirect, spyqmomanometer, digital B.P.
Cardio rascular instrmetation : ECG elctrodes and leads, einthoven triangle, ECG quantification, PC based ECG analysis.

UNIT - III **(20 Marks, 10 Hrs)**

Pacemakers, defibrillators, Biotelemetry, Bedside monitors, ICU (Intensive Care Unit), Heart lung machine, Phonocardio-graph, plethysmograph, Artificial Kidney, Blood cell counters.

UNIT - IV **(20 Marks ,10 Hrs)**

Central Nervous System : The brain, Receptors, Sensory path-away and motor systems, Evoked potential, Electroencephalogram EEG Analysis, EMG (Electromyograph).
Mechanics of breathing 02/Co2 transfer between lungs and tissue cells, spirometer, Artifical Respiration.

UNIT - V **(20 Marks, 10 Hrs)**

Imaging Systems : X-rays, CT Scan, Ultra sonography, MRI (Magnetic Resonance Imaging) endoscopy.

Electrical Safety : Significance of electrical danger, physiological effects of electrical current, shock hazards methods of accident prevention.

Reference Books

1 Biomedical Instrumentation and measurements	Cromwell	PHI
2 Handbook of Bio-Medical Instrumentation	R.S. Khandpur	TMH
3 An Introduction to biomedical Instrumentation.	Prof. S.G. Kahalekar	

TERM WORK :

Term work will consist of record of at least 8 experiments performed by students from the following.
1 Calibration of B.P. Transducer.
2 Testing of ECG machine.
3 Testing of Grounding & shielding of an instrument.

4 Calibration of Heart rate monitoring unit.
5 Design of ECG simulator.
6 Testing of pace maker unit.
7 Testing of bedside monitor.
8 Testing / study of blood cell counter.
9 Study of defibrillator and design of defibrillator simulator.
10 Design of EEG and EMG simulator.
11 Study of X-Ray machine.
12 Study of Ultra Sound Technique.

TERM - I
Communication System - II

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 4 Hrs/week

EXAM SCHEME :

Paper 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT - I **(20 Marks, 10 Hrs)**

Sampling Theorem, Ideal Sampling and Reconstruction aliasing, practical sampling, flat sampling, FDM and TDM, TDM with PAM signal, cross talk and guard time in TDM system.

Probability, Random Variables, PDFs mean, moment, variance etc.. Probability models: Binomial distribution, Poisson distribution, Gaussian PDF, Reyleigh PDF, central limit theorem.

UNIT - II **(20 Marks, 10 Hrs)**

Base band data transmission - Different line course, their properties and spectral features. Transmission limitation because of losses band width (BW) and noise. ISI, EYE pattern and principle of equalisation. Detection of received binary signal, Discrete channel, capacity, statement of Shannon Hartley equation for channel capacity. Trade off between channel capacity and bandwidth.
Overview of PCM and quantisation error, Principle of operation and block schematics for generation DPCM, DM, ADM, Linear predictive coding .

UNIT - III **(20 Marks, 10 Hrs)**

Digital Multiplexing - Multiplexing hierarchy, Inverse Multiplexing, Statistical Multiplexing, Frame pattern, Bit synchronisation, Frame synchronisation, carrier recovery, principle of error detection and correction methods. FEC and ARQ system. Illustrative example of hamming code for generating parity bits, Cyclic code, CRC, Reed solomon.

UNIT - IV **(20 Marks, 10 Hrs)**

Digital Continuous Wave (CW) Modulation - Principles of modulation, Block schematics and comparative study of ASK, FSK, PSK system. Description of DPSK, QPSK, QAM. Introduction to quadrature carrier system and M-ary system. Matched filter decision threshold in match filter. Introduction to TDMA, FDMA technique.

UNIT - V **(20 Marks, 10 Hrs)**

Introduction to information theory. - Entropy and information rate discrete memory less source and coding statement of Shannon Theory and channel capacity for noisy channel. Shannon Fano and Huffman algorithm for channel coding. Voice grade Modem / Digital communication by satellite. Introduction to SCPC and DSI technique.

References

1 Communication systems. A.B. Carlson
2 Digital Communication Proakis
3 Communication systems Kraus
4 Digital Communication Haykin
5 Digital and Analog Communication System K. Sam Shanmugam

TERM WORK :

Term work will consist of record of at least 8 experiments performed by students from the following.

1 To Study Pulse Analog Modulation Technique. (Including sampling theorem).
2 To Study PCM, DPCM, DM, ADM.
3 To Study TDM.
4 To Study Line codes.
5 To Study PDF
6 To Study Frame and bit synchronisation.
7 To Study ASK, PSK, FSK.
8 To Study QPSK
9 To Study QAM
10 To Study Shanon Fano Code (Software)
11 To Study Huffman Algorithm (Software)
12 To Study Entropy, Bit rate, Information rates (Software)

TERM - I
Radiation and Microwave Techniques

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 2 Hrs/week

EXAM SCHEME :

Paper 100 marks
Practical 25 marks
Term Work 25 marks

UNIT - I (20 Marks, 10 Hrs)

Guided wave and transmission systems.

Review of Maxwell's equation, Uniform plane waves, reflection from dielectric conducting interfaces, smith chart, co-axial lines power handling capacity, single stub, double stub, quarter wave transformer.

UNIT - II (20 Marks, 10 Hrs)

Micro-wave guides

Rectangular wave guide's characteristics of TE and TM waves in rectangular wave guides dominant mode, circular wave guides, wave guide excitation.

Micro wave passive devices : Terminators, Attenuator, Travelling detector, Micro-wave filter, resonators , E plane Tee, H plane Tee, Magic Tee, Directional coupler, ferrite components, Microwave bridge Circulators, Isolators, Slotted line, Tuners, coupling probes.

UNIT - III (20 Marks, 10 Hrs)

Micro wave active Devices : Kly stron, Reflex Klyston, Two cavity Klystron, TWT Magnetron, Crystal Diode, PIN Diode, Tunnel diode, Gunn Diode, Varactor diode, Step Recovery Diode, IMPATT Diode, Microwave BJT, FET, TRAPATT, BARITT, MASERS and LASERS.

UNIT - IV (20 Marks, 10 Hrs)

a) Microwave Measurements

Measurement of voltage, VSWR, impedance, frequency, dielectric constant, power capacity attenuation, phase shift, and noise measurement. Antenna gain measurement.

b) Micro - wave antenna

Horn antenna, slot antenna, parabolic reflector cassegrain feed lence antenna, broad side and end fire arrays.

UNIT - V (20 Marks 10 Hrs)

Radar

Principles of Radar, Pulse Radar, Radar Range Equation, Radar Cross-section, Radar antennas & Scanning, Radar Indicators- PPI & A-Scope, noise figure of receiver, Mixer, Duplexer, Line pulses, MTI Radar, CW Radar, FM CW Radar, Doppler Effect, Radar Application.

Reference Books

1) Microwave devices and circuits	Samuel Y. Liao.
2) Microwave principles	J.H. Reach.
3) Foundation for microwave engineering	Robert Collin.
4) Microwave	K.C. Gupta.
5) Radar System	Skolnik TMH.
6) Understanding standing Radar System	Simon Kigsley TMH.

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1) Impedance measurement using microwave bench of different microwave components.
2) Horn antenna-pattern.
3) Parabolic antenna gain impedance, pattern.
4) Passive component-parameter measurement and specification testing.(Two Expt)
5) Active devices characteristic measurements (Four)
6) Study of MIC techniques.
7) Measurement of VSWR.

TERM - I
Digital Signal Processing

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 2 Hrs/week

EXAM SCHEME :

Theory 100 marks
Practical 25 marks
Term Work 25 marks

UNIT - I (20 Marks, 10 Hrs)

Digital against analog processing, Application of DSP, Technology review, Application of DSP in speech processing, biomedical engineering, vibration analysis, picture(image) processing (case studies).
The z-transform and its inverse, system function, poles and zeors : discrete time signals, and systems :Generation of discrete time signals, Properties and algebraic manipulation.
Representative of Discrete system via difference equation.

UNIT - II (20 Marks, 10 Hrs)

Convolutions (linear and circular). Linear time invariant system, Causality, Stability. Digital filter structure, describing equation, system transfer function, filter categories, direct form I & II structures, cascade combination of second order sections, parallel combination of second order sections, FIR filters, lattice ladder structure.

UNIT - III (20 Marks, 10 Hrs)

Definition and properties of Discrete Fourier Transform, Fast Fourier Transform, Decimation in frequency, Decimation in time, Chirp-z-transform algorithm, use of FFT algorithm in linear filtering and correlation, quantization effect of FFT, Frequency analysis of discrete time signals.

UNIT - IV (20 Marks, 10 Hrs)

Filter Design : Design of linear phase FIR filters using windows, rectangular window, Gibb's phenomenon, Triangular window, Hamming window, Blackman window, Kaiser window, Hanning window. Design of linear - Phase FIR differenciators, Comparison of design methods, IIR filters : Design of IIR filters from analog filters, approximation of derivatives, Impulse invariance.

UNIT - V (20 Marks, 10 Hrs)

Hardware architecture of DSP : Study of DSP chip architecture as an examples : (Chip of Texas instruments, Features of DSP chip architecture and instructions TMS c320, comparison with microprocessor chip.

Applications: Dual - tone multiply signal detection spectral analysis using DFT, sub band coding of speech and special & audio signals over sampling D/A, over sampling A/D, Applications of Multi-rate signal processing : Bio medical, statistical signal processing, Image processing.

.Reference books.

1	Digital Signal Processing	Proakis & Manaklis Third edition Prentice Hall.
2	Digital Singal Processing A Computer Based approach	S.K. Mitra TMH, 1998.
3	DSP.	Rabiner and Gold
4	Discrete Signal Processing.	Opparhein and Schraffer
5	Introduction to Digital Signal Processing	Jony R. Johnson PHI
6	Digital Signal Processing	Salivahanan
7	Texas Instruments Mannual.	
8	Analog Devices Manual.	

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Floating point calculations of real and complex functions.
2 Generate wave forms from algebraic formula.
3 IIR filter design by Butter worth/Chebyshev and conversion into digital Via Bi-linear transformation.
4 Computer discrete Fourier Transform of a signal.
5 Implementation of FFT algorithm.
6 Realization of Discrete transfer function.
7 Computing of linear and circular convolution.
8 FIR filter design using different windows.

TERM - I
SEMINAR

TEACHING SCHEME : **EXAM SCHEME :**

Practical 2 Hrs/week **Oral 50 marks**

Student shall select a topic based on latest research and development in the field of electronics, telecommunication, computer or allied field. He / She shall undergo detail study of the topic under supervision of guide. He / She shall submit a seminar report consisting of introduction, literature survey concept, analysis, application, future development and other information related to seminar topic.

Exam Scheme
Seminar shall assessed by a panel of Two examiners appointed by University authority (one of which shall be guide).
Seminar exam shall consist of presentation by student in the presence of examiners & Staff members & other students of the duration of about 15 to 20 Minutes followed by oral exam.

Evaluation Scheme

Quality/Presentation of Report	- 10
Presentation	- 20
Subject knowledge	- 20

TERM - I
PROJECT PART - I

TEACHING SCHEME : **EXAM SCHEME :**

Practical 4 Hrs/Week **Term Work 50 Marks**

Project work will be carried out by a batch of at the most 3 students working on a topic related to electronics, telecommunication, computer science (Simulation base) and allied field. The topic may be from one of the following :

1 Laboratory work involving theoretical design and implementation of the electronic [allied field] system/project.

2 Design modification with fabrication of an existing electronic system / equipment.
3 System design and fabrication based on practical need of industry.
4 Simulation software.

In the first term batch of students must get approved synopsis of the project and register the name of project to university within 4 weeks form the commencement of term. Theoretical design of project and at least 25% of implementation must over during the first term. Candidate shall submit term work in the form of hand-written / typed report which should include literature survey, technical details, design and related data that are required for project work Part - II and a separate progress report consisting of date-wise attendance and work done on that day.

The candidate shall give a talk on topic of project in the presence of staff members and students. The term work will be assessed by two internal examiners (One of the examiner shall be guide and other examiner shall be teacher of concerned dept.) appointed by principal of institution.

Elective - II

TERM - II

Computer Communication

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 4 Hrs/week

EXAM SCHEME :

Theory 100 marks
Practical 25 marks
Term Work 25 marks

UNIT - I (20 Marks, 10 Hrs)

Computer Network : Need and goals, Network topology, Comparison with distributed system Classification, Broadcast type, Point to Point Network, Geographical spread - LAN, MAN, WAN. Ethernet- features, media access method, Band width, Transmission medium, AUI length, frame transmission, Ethernet Operation.
SONET/SDH Protocol, Frame structure and standards ATM Frame structure and Standards

UNIT - II (20 Marks, 10 Hrs)

OSI model, Features, Encapsulation Routing, Layering, Addressing, Peer to Peer Communication, Error handling.
Physical Layer, Data link layer & its frame, Network layer, IP protocol, Transport layer, TCP and UDP, Session layer, Presentation layer, Application layer, Design issues in the layer, Comparison between OSI and TCP/IP model.
ALO HA, CSMA/CD

UNIT - III (20 Marks, 10 Hrs)

IEEE Standards of LAN, 802.n, Ethernet frame format, Frame length 802.4 token bus, 802.5 token ring, Data flow control operation, Sliding window protocol, Bridges, 2 - port bridge, Transparent bridge, spanning tree bridges.

Delay Modelisation Data Networks
Little's theorem M/M/1, M/M/m, M/M/∞, M/M.M/M and M/G/1.

UNIT - IV (20 Marks, 10 Hrs)

Network layer in internet, IP protocol address calculation, subnets design, Internet Control Protocol, ICMA, Routing algorithm Distance vector routing, IPV4 and IPV6 address resolution protocol (ARP).

UNIT - V 20 Marks 10 Hrs

Network management desired features, Protocols model, Manager, Agent, MIB, Architecture, SNMP V1, V2, SMI, Structure management information, Object identifier.
Network hardware components, Network interface card, Cabling, Modem, Modem Standards Server requirements, HUB, Network operating system, Functions features of window NT and Novel Netware.

Reference books

1 Computer Network Tanenboom
2 Internetworking with TCP/IP Vol I and II by Corner
3 Data Communications by Stallings

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Study of network component like cables, connectors, switches, hubs, bridges, routers, gateways.
2 Installation of network interface card within computers & connecting two machines on windows / Novel netware.
3 Study and implementation of novel modem.
4 To establish INTERNET connection using dial up modem on windows and configuration of same machine as a proxy server for WWW.
5 Configuration of main server for an institution.
6 Implementation of socket programming.
7 Study of network application like TELNET, FTP, Remote login.
8 To write a ic program for implementation of shortest path routing algorithm.
9 To study any one LAW topology.
10 To install and study any one network management software.
11 Implementation of sharing of disk resources on a window system.
12 To study IP render.

TERM - II

Elective - II

FIBER OPTIC COMMUNICATION

TEACHING SCHEME :

Lecturers 4 Hrs/Week
Practical 4 Hrs/Week

EXAM SCHEME :

Theory 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT - 1 (20 Marks 10 Hrs)

OPTICAL FIBER WAVE GUIDES AND TRANSMISSION CHARASTERISTIC :

Ray theory of transmission, total internal reflection, acceptance angle, numerical aperture, Electromagnetic mode theory of optical propagation, modes, cylindrical fibers, mode coupling, step index multi mode and single mode fibers, graded index fiber Normalise Frequency.

Losses-Material absorption, linear scattering, non linear scattering, bend losses. Inter modal dispersion, inter modal dispersion, overall fiber dispersion, polarisation.

UNIT - II (20 Marks, 10 Hrs)

CABLE CONSTRUCITON CONNECTION AND MEASUREMENTS :

Preparation of Optical fibers - MCVD and VAD.

OPTICAL FIBERS - Multi mode step and graded index, single mode, plastic clad, all plastic fibers. Fiber strength and durability.

Joints and Couplers - fiber alignment and joint losses, fiber splices, fiber connectors, fiber couplers.

Measurement-Refractive index profile, field intensity distribution, Attenuation measurements, band width, numerical aperature, field measurements.

UNIT III (20 Marks, 10 Hrs)

OPTICAL SOURCE AND DETECTORS :

Source-Laser-Basic concepts, optical emission from semiconductors, semiconductor injection laser, injection laser characteristic & Method of modulation.

LED-Power and efficiency, structures, characteristics, modulation.

DETECTOR-Principal of detection, absorption, quantum, efficiency, responsivity, long wave length cut-off. Semiconductor photo-diodes with and without internal gain, midbinfrared photo-diodes, photo-transistors.

Power launching - source to fibre, laser diode to fibre, LED to single mode fibres.

UNIT-IV (20 Marks, 10 Hrs)

FIBER OPTICS SYSTEM :

Preamplifier, receiver amplifier circuits, receiver structure, optical transmitter and receiver circuits. Digital System, digital system planning considerations, analog system, advanced multiplexing strategies, Modulation formats, demodulation schemes, receiver sensitivities, single and multi-carrier systems.

UNIT -V

INTEGRATED OPTICS & APPLICATION :

Optical amplifiers, Directional coupler, Mach-Zender interferometer, optical switches, optical integrated Circuits, Dense WDM Ballaron Devices photonic Switching, SONET/SDH, FDDI, Fiber optic as sensors. Public network application, Military applications, Civil, Consumer and industrial application local area networks, Computer application.

Reference books

1 Optical Fiber Communication	John M. Senior
2 Optical Fiber Communication	Gerd Keiser
3 Optical Communication	John Gowar
4 Fibre Optical Communication	J.D. Agrawal

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Electrical characteristics of LED/LD.
2 Photometric characteristics of LED/LD (Polar plot, intensity measurement etc.)
3 Numerical aperture measurement for GI fibre, SI fibre.
4 Attenuation measurement of fibre.
5 Sepctral characteristics of LED/LD.
6 Fibre Optic transmitter receiver parameter measurement.
7 Study of fibre optic connectors.
8 Spectral response of optical fibre.
9 Parameter measurement of opto-isolator.
10 Study of OTDR.

TERM - II

Elective - II

Digital Image Processing

TEACHING SCHEME :

Lectures 4 Hrs/Week
Practical 4 Hrs/Week

EXAM SCHEME :

Paper 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT - I (20 Marks, 10 Hrs)

INTRODUCTION

Digital Image Representation, Elements of Digital Image Processing System, Elements of Visual Perception, Image Model, Sampling and Quantization - Uniform and Non-Uniform, Relationships between Pixels - Neighbours, Connectivity, Distance, Arithmetic/Logic Operations, Imaging Geometry - Basic Transformations, Perspective Transformations, Camera Model, Camera Calibration, Stereo Imaging.

UNIT - II (20 Marks, 10 Hrs)

IMAGE TRANSFORMATION

Fourier Transform, Discrete Fourier Transform, Properties of 2D Fourier Transfor, Fast Fourier Transform, FFT Algorithm and Implementation, Separable Image Transforms - Walsh Transform, Hadamard Transform, Hotelling Transform, Hough Transform.

UNIT - III (20 Marks, 10 Hrs)

IMAGE ENHANCEMENT

Spatial-Domain Method and Frequency-Domain Method, Histogram Modification Techniques, Local Enhancement.

Image Smoothing - Averaging, Median Filtering, Low pass Filtering,, Ideal Filter, Butterworth Filter, Averaging of Multiple Images.

Image Sharpening - Differentiation, High pass Filtering, Ideal Filter, Butterworth Filter. Pseudo-Colour Image Processing.

UNIT - IV (20 Marks, 10 Hrs)

IMAGE RESTORATION

Degradation Model, Diagonalization of Circulant and Block Circulant Matrices, Algebraic Approach to Restoration, Restoration in the Spatial Domain, Geometric Transformations - Spatial Transformation, Gray - level Interpolation.

IMAGE ENCODING

Fidelity criterial, Encoding Process, Entropy, Huffman Code, Shift Codes, b-Codes, Error Free Encoding, T-Algorithm, LML rule, IA rule, IP Algorithm, ID/2D Run Length Encoding Coding Considerations.

UNIT V (20 Marks, 10 Hrs)

IMAGE SEGMENTATION

Detection of Discontinuities, Point/Line/Edge Detection, Combined Detection, Edge Linking and Boundary Detection.

Thresholding - Global/Optimal Thresholding, Region Oriented Segmentation, Region Splitting and Merging..

IMAGE STANDARDS

JPEG and MPEG Standards, Graphics image file Formats - BMP, TIFF, PCX, GIF.

REFERENCE BOOKS :

1 Digital Image Processing — Rafael Gonzalwis and Paul Wintz .
2 Image processing — Philip .
3 Fundamentals of Digital Image Processing — Anil K. Jain — PHI
4 Image processing, Theory, Algorithm and architecture — Sid Ahmad — McGraw Hill

TERM WORK

Term Work will consist a record of minimum eight experiment out of the following.

1 Study of various Image File Format e.g. BMP, TIFF, PCX, GIF, JPEG for typical images.
   a B/W images to develop a C Program to open a B/W image in one of the above formats and save the pixels in text files.
   b Image of Constant intensity.

2 To develop a Program to study image attributes like Grey levels and Histogram, Grey level operations through look up tables.
3 To develop a Program to implement general purpose M*N masking operation (2D convolution). Program should be able to scale the output to save the same as an image.
4 To develop a Program to implement general purpose M*N 2D FFT. Program should be able to scale the output to save the same as an image.
5 To develop a Program to implement image enhancement technique like Noise filtering, Contrast Stretching, Edge Crisping.
6 To Study image Restoration techniques like doubling, morphology operators like dilate and erode.
7 To develop a Program for Image Feature Extraction techniques like Edge detection, geometric moments statistical parameters, Hough Transform.

8 To develop a program to implement a image compress technique using :
a Transform method - DCT
b Huffman/RLE coding
c Quantizaiton

9 Develop a software to convert colour image in BMP format into B/W image in BMP format.
10 Demonstrate usage of frame grabber card to capture image, video source and save it as standard file.

Staff member should frame minimum eight assignments based on the above topics. All image processing algorithms should be applied to standard image file format and program development should be on Windows Platform.

TERM - II

Elective - II

INFORMATION TECHNOLOGY

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 4 Hrs/week

EXAM SCHEME :

Theory 100 marks
Practical 25 marks
Term Work 25 marks

UNIT I : (20 Marks, 10 Hrs)

1 Multimedia : Introduction MM Technology
Present scenario, Applications of MM, H/W devices used in MM, S/W and MM, Multimedia Devices mass storage devices. optical drive. magnetic drive, CDROM, DVD, Scanners different types, CCD types, Sound cards, Microphones, Modem, Sound and display Adapters/Drivers, Multimedia standard.

UNIT - II (20 Marks, 10 Hrs)

Multimedia software programming
Multimedia programming support in windows 0.5, Communication application, Dial up network, sound editors, interactive voice response applications, Remote - Video conferencing techniques, Graphics file formats., BMP, TIFF, GIF, JPEG, MP3 format.
Graphics packages, Image processing packages, Data mining and data warehouses.

UNIT - III (20 Marks, 10 Hrs)

Introduction to embedded system software
Study of O.W. used in small system devices i.e. PSOS, VxWorks.
Study of DOS kernel, device drivers, TSR's

UNIT - IV
Networking Devices : Study of networking devices Ethernet cards, HUB, Routers, Switches Bridges, Multiplexors, Gateways.
Overview of Network systems, LAN/WAN, wireless LANN, Satellite networking, case study of existing LAN?WAN system, Inter drive provider setup. Exposure to VPN (Virtual Private LAN).

UNIT - V (20 Marks, 10 Hrs)

Business on the Internet :
Necessity of on line Business, Acceptable uses and custom of the Internet, E-Business, access control and security, case study Firewall security.

Business and professional Resources on the Internet, Business to business and business to customer, Your Business online now and in the future.

Reference books
1 Multimedia Computing Communication applications PH STR INNovating techniques series.
Ralf - Steinmetz Klara Nahrstedt
2 Multimedia in Practice : Juaith Jeffocoate PHI 1998

3 Windows Multimedia and animation with C++ programming for windows 95. Michel J. Young, .
4 Virual C++ Multimedia and window set, Colicils Group Books. Alitiken Jarol

5 ISDN and Broudn Band - ISDN with frame relay and ATM - Willam Stallings.
6 ATM networks, concepts protocols, applicatin Rainev Hancel, Manfred N. Huber Stephe Schrodev Addission Wesley.
7 Computer Networks Tannebaum IInd and III rd edition PHI.
8 High speed Networks William Stallings.
9 Principles of computer communication N/W design J. Seidler Ellis Horwood.
10 Fast Ethernet - Johnson.
11 The new Interest Business Book - ELLSWORTH & ELLS WORTH - John Wiley 1996 publication.

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

Group I : Multimedia assignments
1 Study of sound file format, Wav VOC. (Assignment should be framed on conversion, editing and appending, above file formats).
2 A law and u law companding techniques (Implementation on sound files).
3 Use of Multimedia library of implement general announcement system. (Windows 95, C/C++, VC++ programming assignments).
4 Modem interface for Dial up data transfer.
5 Modem programming for incoming Tel. Dialled digit identification, switching into voice, server machine configuration)
6 Use of 3D studio & features.
7 Study of graphics data file formats. BMP, TIFF, GIF (Assignments should be framed on image processing application like grey level, Histogram etc.)
8 Image grabbing and processing using Scanners or CCD camera.

Group II : Network programming
9 .Case study of Existing network,study of network components & references.
10 Case study of internet - service providers set up.
11 Configuration and setup any one of the following, Router, Proxy server,Web Server Mail server.
12 Communication between PC's using Telnet, and data transfer using FTP.
13 Dial up networking using Modem.
14 Remote printing, shell access, login.

TERM - II
TELEMATICS

TEACHING SCHEME :

Lecturers 4 Hrs/Week

EXAM SCHEME :

Theory 100 Marks
Term Work 25 Marks

UNIT - I (20 Marks, 10 Hrs)

Introduction to Telephone Networks. Basic telphone link and its details, principles of manual, automatic switching subscriber's instrument set, DTMF, Antiside tone ciruit.
Concept of centralised switching, step by step exchange, Cross bar exchange system.
Electronic Exchange Systems, Principles of stored programme control, (Ess as typical example), Basic PCM system, Trunk circuits, Traffic analysis, Study of typical EPABX -C DOT-128 system, Trunk operation.

(20 Marks, 10 Hrs)

UNIT - II

Mobile communication system cellular N/w structure, Radio N/W planning. The C-Network. The GSM system, Mobile handset, Cellular phone, System implementation, Receiver and transmitter unit, Logic Unit. Antenna for cellular phone, Call Process - Land to mobile and mobile to land, Mobile to mobile.

(20 Marks,10 Hrs)

UNIT - III

Message transmission, telex, tele-printer, teletext services, CCITT standard, picture transmission, Video texts, Video tele-conferencing.

Modern tele-matica, e-mail, cord less phone, paging, city cell, FAX.

(20 Marks,10 Hrs)

UNIT - 1V

Digital communication networks : Protocol its necessity and standards. Network architecture OSI/ISO circuit switching, message switching, Packet switching X-25 standards. Topology, network access methods, LAN, Ethernet, Interfacing of different networks, Concept of Internet, TCP/IP, World Wide Web, Web page, V-Sat.

(20 Marks, 10 Hrs)

UNIT - V

ISDN, Narrow band, Wide band.

Modem, Standard, Block diagram, Interfacing with Computer.

ATM Switches, Wireless LAN.

Reference Books

1 Mobile Cellular Communication	Wey Lee
2 Computer networks	Tannenbaum
3 Digital Analog and Data Communications	William Simsema PHI
4 Data Communication Networks and Systems	Thomas C. Bartee.
5 Introduction to Digital Communications Switching	Pitmal John Royanyne
6 Basic Guide to Data Communication	Ray Sarch (McGraw Hill)
7 Computer Communication Networks -	Tanenbaum PHI
8 Digital Telephony	Bellamy

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Study of subscriber's instrument set.	2 Study of Telephone exchange [Any 2 types]
3 Study of typical EPABX-CDOT-128 sytem.	5 Study of receiver / transmitter for celular phone.
4 Study of mobile hand set.	7 Study of FAX machine.
6 Study of Teleprinter.	9 Study of cordless telephone set.
8 Study of paging unit.	11 Study of any one modem.
10 Study of web page design.	

TERM - II
CONSUMER ELECTRONICS

TEACHING SCHEME :

Lecturers 4 Hrs/Week
Practical 2 Hrs/Week

EXAM SCHEME :

Theory 100 Marks
Practical 25 Marks
Term Work 25 Marks

(20 Marks,10 Hrs)

UNIT - I

SOUND RECORDING AND REPRODUCTION :

Principal and block schematic of Disc recording, Magnetic recording, Optical recording, Compact disc recording and reproduction system. Source of distortion in disc and tape equipment.

Audio amplifier and subsystem-Audio amplifier, Noise and distortion, noise reduction techniques, Hi Fi, stereo phone.

Public Address System - block diagram, requirement, characteristics, its planning for various use.

UNIT - II (20 Marks, 10 Hrs)

VIDEO RECORDING AND REPRODUCTION :

Basic concept, history, relation between tape speed and bandwidth, head gap, writing speed, FM modulation, helical tape scan-recording of luminance and colour signal on same track, recording and reproduction of video signal in VCR from magnetic tape, block diagram of VCR, VCP, simultaneous recording and viewing, VCR formats, specification and concept of VHS, Betamax, Vedio2000, U-matic, ENG,VCR control, VRD, CED, Laser vision, Optical Memory disc.

UNIT - III (20 Marks, 10 Hrs)

TELEVISION TRANSMITTER AND RECIVER :

Black and white-Basic concept, Scanning, aspect ratio, kell factor, horizontal and vertical resolution and bad width, composite video signal, Camera tube's working, characteristics and receiver bloc diagram.
Colour-Colour fundament, colour mixing, colour camera tube and picture tube.
PAL, SECAM, NTSC systems concept and encoder and decoder, colour TV transmitter and receiver block diagram.

UNIT - IV (20 Marks, 10 Hrs)

MODERN HOME APPLIANCES :

Block diagram and working of FAX, microwave oven, washing machine, video telephone, CD player, HDTV, CATV,CCTV.Mobile Telephone Video conferencing

UNIT - V (20 Marks, 10 Hrs)

Personnel Computer :

Block diagram and working of PC, Mother board and its specification, CRT controller, FDD controller, HDD controller, Key board controller.

Internet:- Design of Web page, Internet application, Internet Service Provider and Band width allocation lease lines, dedicated lines Dial-up connection,

Reference book

1 Audio and Video System	R.G. Gupta
2 Television Engineering	A.M. Dhake
3 Intel Manual	
4 IBM PC and Clone	Govind Rajalu
5. Internetworking with TCP/IP Vol I and II.	Comer

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 To plot frequency response of Tone control/graphic Equaliser.
2 Study of tape recorder.
3 Study of C.D. player.
4 Study of AM/FM receiver.
5 Study of Colour/Black & White receiver.
6 Study of VHS/VCR.
7 Measurement of DC voltages and plotting wave forms at various points of TV receiver.
8 Fault finding in TV.
9 Fault finding in Tape recorder.
10 Fault finding in VCR.
11 Fault finding in PC.
12 Study of FAX machine.

TERM - II
ELECTRONIC MEASUREMENT

TEACHING SCHEME :

Theory 4 Hrs/week
Practical 2 Hrs/week

EXAM SCHEME :

Paper 100 Marks
Practical 25 Marks
Term Work 25 Marks

UNIT - I **(20 Marks, 10 Hrs)**

Vector Impedance Meter, Digital LCR Meter, Q-meter, Elements of scalar network analyser, ESR, ESL measurements. True RMS voltmeter, Sampling Volt meter, Vector Volt meter, AF and RF power measurements. Measurement of Magnetic material parameter.

UNIT - II **(20 Marks, 10 Hrs)**

Digital Storage Oscilloscope - Triggered and delayed sweep multi-tracing, HF sweep, Delay lines, Sampling scopes, Special purpose oscilloscope, TDR, Real time digital readout scope , Oscilloscope passive, active probes,. Power scopes, Signature analyser.
Recording Instruments, Galvanometric, potentiometeric, X-T, Circular chart, Magnetic and photographic recorders and XY plotters.

UNIT - III **(20 Marks, 10 Hrs)**

Frequency synthesizers, noise generators and noise measurements, acoustic measurements. EMI/EMC measurements. Frequency and time measurements, Frequency and time standards, Digital frequency, Counter/Timer. Spectrum analyser peophometric measurements, Wabolator and Wabuloscope, Wave analyser & Harmonic Distortion analyser

UNIT - IV **(20 Marks, 10 Hrs)**

Date Acquisition and Control System, Single channel & multichannel DAS, Automatic Test System, Logic Analyser, Communication Line Measurement. Cable fault locator, Link tester, Bit error rate tester, Computer control test system .
OTDR, Optical spectrum analyser, optical power metre.

UNIT - V **(20 Marks, 10 Hrs)**

Measurement of non-electrical quantities using electronic systems.
Vibration - Characteristics
Piezoelectric accelerometer servo accelerometer.
Pressure - Strain gauge pressure transducer.
Potentio metric pressure transducer.
Flow - Electromagnetic flow meter ultrasonic flow meter
Force - Semiconductor load cell.
Torque - In line rotating & In line stationary torque sensor.
Introduction to optical fibre as sensor.

References Books

1	Principle of measurement and Instrumentation	Allen S. Morris.	PHI
2	Modern Electronic Instrumentation and Measurement Techniques	Albert D. Helfrick WD Cooper	PHI
3	Instrumentation Devices and System	C.S. Rangan, G.R. Sharama V.S.V. Mani	
4	Instrumentation measurements and analysis	Nakra Choudhari	
5	Electronic Measurement	Oliver Cage	TMH
6	Electric Instrumentation	Jones & Chin	Wiley.
7	Electrical & Electronic Measurement & Instrumentation	A.K. Shawrey	Dhanpat Rai
8	Industrial Instrumentation & Control	S.K. Singh	

TERM WORK

Term work will consist of record of at least 8 experiments performed by students from the following.

1 Calibration of Multimeter, True R.M.S. Multimeter Accountancy, Error, Precision measurement.
2 Q. Meter (A.F. & R.F.)
3 Harmonic distortion meter.
4 Measurement on C.R.O. Component test, simple external curve tractor.
5 Digital/Analog storage oscilloscope and measurements.
6 Digital freq. Counter and its application.
7 Spectrum analyser.
8 Logic Analyser.
9 Recorders (XY, & XT)
10 Vector voltmeter & phase meter measurement.
11 Measurement of non electrical qualities (2 expts).

TERM - II
Technical Visit

EXAM SCHEME :

Term Work 50 marks

The technical visit is a part of the learning process that starts before the visit and continues after the visit. Institution shall arrange at least two industrial visits to the Electronics Telecommunication, Computer and to the allied field industries/organisation about eight hour duration.Institute shall obtain appropriate certificate of visits from the concern industries/organisation. Students shall submit written report about the visits individually or in small groups (2-3 students).

The report should contain the information about the following.

1) The organisation - Activities of organisation and administrative set up technical personnel and their main duties.
2) The project/industry brief description with sketches and salient technical information.
3) The work/process observed with specification of materials, items of work, equipment etc. and the role of engineers.

The evaluation of the report of technical visit may be made by panel of 2 teachers appointed by the principal, as per following parts.

a) Coverage Aspect : Almost all items shall be covered.
b) Detailed Observation : System/Process/Product explained with data, diagram specification.
c) Quality of Presentation : Report shall be very objective and consist of clean and systematic organisation of topics and information.
d) Critical : Displays unusual clarity to observe critically and to give his own idea regarding merits, de-merits, improvement needed etc.
e) Viva voce : A Viva voce shall be conducted on the technical visit report by the subject teacher to access the specific knowledge gained by the students for technical application.

TERM - II
PROJECT PART - II

TEACHING SCHEME :
Practical 4 Hrs/Week

EXAM SCHEME :
Term Work 50 Marks
Oral 50 Marks

Project work Part - II will be the continuation of project Part - I. Undertaken b the candidates in the first term. The term work shall consist of a typed report on the work carried out by the batch of students in respect of the project assigned during the first term Part - I and the second term Part - II.

Report shall consist of introduction ,literature survey , concept, Design & analysis, application future development and other information related to project topic. Only those data sheets shall be

included in the project report which are not studied in the previous years and absolutely required for the project.

ORAL EXAMINATION :

It shall consists of an oral examination based on the report submitted by the candidates and/or the demonstration of the fabricated designed project. The said examination will be conducted by a panel of two examiners, consisting of the guide and another external examiner preferably form Industry or other university.

NOTE :

The candidate must bring the project Part - I report and the final report completed in all respect while appearing for practical examination of the project.