COURSE NAME : DIPLOMA IN ELECTRONIC & TELECOMMUNICATION ENGINEERING

COURSE CODE : E T

SEMESTER : FIFTH

SUBJECT TITLE : COMPUTER ARCHITECTURE AND MAINTENANCE

SUBJECT CODE : ET 5001

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	PAPER HRS	TH	INT	PR	OR	TW	TOTAL
03	02	03	80	20	--	--	25*	125

Pre-requisites :- Students should know the following concept

Pre-requisites :- Students should know the following concept

1) Basic knowledge of computer concepts
2) Basic knowledge of computer hardware

Objectives:- The student will be able to

1) To debug and repair the fault in system
2) To assemble the system
3) To load the operating system And device drivers in the system

Subject Title : COMPUTER ARCHITECTURE AND MAINTENANCE	Subject Code: ET-5001

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**Motherboard And Its Components** Different types of PC configurations and their comparison Chipset basic, chipset Architecture : North/South Bridge architecture and Hub architecture Architecture of Intel chipset 915 G& 945 G Overview and features of ISA, PCI-X, PCI-Xpress, AGP, Processor Bus (no pin description) Comparison between PCI and PCI Express Logical memory organization : Conventional memory, Extended memory, Expanded memory (No memory map) Concept of cache memory : Internal cache, External cache (L1, L2, L3 cache) Overview and features of SDRAM, DDR, SDRAM, DDR2, SDRAM, DDR3 BIOS Basics	**08**	**10**
02	**Storage Devices And Its Interfacing** Recording Technique : RM, MFM, RLL Perpendicular magnetic recording Hard disk construction and working Terms related to Hard Disk : Track, Sector cylinder, cluster,Head parking, MBR, Zone recording Formatting, Low level formatting, High level formatting,partitioning Hard disk drive interface : features of parallel AT attachment (PATA), Serial AT Attachment (SATA), External SATA (no pin discription) CDROM drive : Construction, recording DVD : Construction, Recording	**08**	**10**
03	**Display Interfacing** CRT colour monitor : Block diagram and function of each block Characteristics of CRT monitor : Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, Interlaced versus non interlaced monitor Advantages of CRT display over LCD display LCD monitor : functional block diagram of LCD monitor, working principal, advantages and disadvantages Types:Passive matrix and Active matrix, Important characteristics : Resolution, Refresh rate, Response time. Basic block diagram of a video accelerator card	**05** **08**	**10** **20**
	Input & Output Devices Construction, working & Installation of : Keyboard.		

	Mouse: Mechanical, Optomechanical, New optical Scanner: Types, Flat bed, Block diagram and specifications.Modem: Internal and External: Block diagram and specifications.Printer: Dot matrix, Inkjet, Laser: Block diagram and specifications		
05	**Power Supplies** Block diagram and working of SMPS. Signal description and pin diagram of AT and ATX connectors Power supply characteristics: Rated wattage, Efficiency,Regulation, Ripple, Load regulation, line regulation Power problems : Blackout, Brownout, surges and spikes Symptoms of power problems Protection devices : Surge suppressor : working UPS : Block diagram, working, Types, Rating	**04**	**10**
06	**Interfaces** SCSI, SCSI cables and connectors, SCSI drive configuration.USB features RS232 : (Voltages & 9 pin Signal description) Centronics (interface diagram, signals and timing waveform)Firewire features	**05**	**10**
07	**PC Diagnostic, Testing And Maintenance And Tools** Preventive Maintenance : Active Preventive maintenance, passive preventiv maintenance, periodic maintenance procedure Preventive maintenance of peripherals of PCs. Fault finding and troubleshooting of the above peripherals ESD (Electrostatic discharge), RFI protection Working of logic probe, logic purser, current	**10**	**10**
	Total	**48**	**80**

List of experiments:

1. Study of components of Pentium IV motherboard
2. Study of HDD, its installation and partitioning
3. Study of Display adapter
4. Study of Keyboard
5. Study of Mouse and its types
6. Study of Flat bed scanner
7. Study of printers (Any one type, preferably Laser printer)
8. Study of modems
9. Study of SMPS
10. Study of UPS
11. Study of preventive maintenance of peripherals of PC

Recommended Books: Pearson Educatio

Sr. No.	Author	Title	Publisher
01	Mike Meyers, Scott Jernigan	Managing & Troubleshooting PCs	Tata McGraw Hill
02	Bigelow	Bigelow's Troubleshooting, Maintaining & Repairing PCs	Tata McGraw Hill
03	Mark Minasi	The Complete PC Upgrade & Maintenance Guide	BPB Publication
04	DBalasubramanian	Computer Installation & Servicing	Tata McGraw Hill
05	Scott Mueller	Upgrading & Repairing PCs	

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : MICROCONTROLLER & MICROPROCESSOR

SUBJECT CODE : ET 5002

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
04	02	3	80	20	50**	--	--	150

Pre-requisites:-The students are expected to know the following concepts:

1) Architecture of 8085 microprocessor
2) Pin diagram of 8085 microprocessor
3) 8085 instruction set
4) Basic concept of I/O devices

Objectives :-The student should be able to :

1) Use data transfer techniques for serial & parallel communication
2) Describe the interfacing of I/O devices with 8085
3) Describe the RISC & CISC Architecture
4) Compare between Microprocessor & Microcontroller
5) Describe architecture and pin diagram of 8051
6) Develop assembly language program using instruction set of 8051

Subject Title : MICROCONTROLLER & MICROPROCESSOR	Subject Code: ET-5002

Contents: Theory

Unit	Name of the Topic	Periods	marks
01	**Peripheral Devices** Need of peripheral Data Transfer Techniques Synchronous and Asynchronous Serial and Parallel Hand shaking, Polling, Interrupt driven Microprocessor controlled with DMA (Only concept of DMA; no chip details)	**02**	**04**
02	**Programmable I/O Devices** IC 8155 Block Diagram, pin out, operating modes, Simple I/O programs and Interfacing with 8085 Microprocessor.Comparison of features of 8155, 8355 and 8755 Minimum system configuration of 8085 Microprocessor.IC 8255 Block Diagram, pin out, operating modes,Simple I/O programs and Interfacing with 8085 Microprocessor.Interfacing of A to D Converter with 8085 Microprocessor.Interfacing of D to A Converter with 8085 Microprocessor.Practical Applications using 8085 Microprocessor.Stepper Motor ControlTemperature Control	**12**	**18**
03	**Introduction to Microcontroller** Comparison of Microprocessor, Microcontroller and Microcomputer. Evaluation of Microcontroller Terminology: - RISC, CISC, VLIW, Harvard and Von Neumann Architecture Memory types:- EEPROM and FLASH Commercial Microcontroller devices and families	**02**	**06**
04	**8051 Microcontroller** MCS-51 Architecture and details Pin configuration 8051 Hardware details- Clock, Oscillator, Registers, SFRs, DPTR, Flags, Stack, PC, Ports Internal RAM and ROM as Data Memory and Program Memory Connections of External Memory	**14**	**18**
05	**Addressing Modes and Instructions of 8051** 8051 Addressing modes MCS-51 Instruction Set Simple Programming	**08**	**06**

06	**Assembly language programming of 8051** Development systems tools Editor, Assembler, Linker Creating various files to run the 8051 program (asm, obj, lst and hex files) 8051 Data Types and Directives (DB, ORG, EQU, END etc.) Software Simulators of 8051 SPJ Systems, Keil	**02**	**08**
07	**Timers/Counters, Interrupts and Serial Communication** Timer modes and programming of 8051 timers Study of SFRs of TimerTMOD and TCON in detail Interrupts of 8051 and their priority Study of IE and IP SFRs Study of SBUF, SCON and PLAN SFRs	**08**	**20**
	Total	**48**	**80**

List of Practical:

1) 8155 Interfacing :(I/O Mode, Generation of square and sine wave using Timer mode)
2) 8255 Interfacing: (I/O Mode and BSR Mode Operations)
3) Generation of square, triangular and sine wave using DAC
4) Any one application of A to D converter Interfacing.
5) Stepper Motor Control
6) Addition, Subtraction, Multiplication and Division operations
7) Packing and unpacking of 8 bit data
8) Finding seven segment code using look up table
9) Square wave generation using internal timer of 8051

Recommended Books:

Sr. No.	Author	Title	Publisher
01	Deshmukh	Microcontrollers: Theory & Applications	Tata McGraw-Hill
02	Predko	Programming & Customizing	Tata McGraw-Hill
03	Mazidi	8051 Microcontroller 8051 MicroController	

COURSE NAME : **DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING**

COURSE CODE : **ET**

SEMESTER : **FIFTH**

SUBJECT TITLE : **DIGITAL COMMUNICATION**

SUBJECT CODE : **ET 5003**

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
04	02	3	80	20	--	25**	--	125

Pre-requisites:-To study digital communication , students should know the following concepts:

1) Basic concepts of communication
2) Basics of analog communication
3) Concepts of modulation
4) Analog modulation techniques
5) Need of multiplexing

Objectives:-After studying this subject students will be able to expain

1) Digital communication systems
2) Channel capacity theorem and entropy
3) Sampling theorem and aliasing effect
4) Generation of PAM ,PWM,and PPM
5) Transmission and reception of PCM ,DM,ADM,DPCM
6) Need to continuous wave modulation
7) Shift keying techniques and their applications
8) M-ary techniques
9) Multiplexing techniques
10) Multiple access techniques
11) Spread spectrum modulation , its types and applications

Subject Title : DIGITAL COMMUNICATION	Subject Code: ET-5003

Contents: Theory

Unit	Name of the Topic	Hours	Marks
01	**Introduction of Digital Communication** Basic digital communication system, block diagram Channel capacity-definition, Hartley's law, Shannon-Hartley theorem, Channel capacity equation, channel noise and its effect, entropy Advantages and disadvantages of digital communication	04	08
02	**Pulse Communication** Introduction, comparison with Continuous Wave Modulation, Advantages Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling PAM, PWM, PPM definition, generation, block diagram,waveform analysis, and their comparison. Pulse code modulation- block diagram of PCM transmitter & receiver, sampling quantization, quantization error, compading, inter symbol interference Delta modulation- block diagram of DM, slope overload,granular noise.ADM, DPCM, block diagram and its working.	14	18
03	**Digital Modulation Techniques** ASK, FSK, PSK definition & waveforms, their transmitter and receiver block diagram and working.M-ary encoding. QPSK, QAM, DPSK block diagram of transmitter and receiver and working. Bandwidth for each modulation technique and their comparison.	12	18
04	**Coding methods and Error control** Baud rate, Bit rate.Line coding - unipolar, bipolar - NRZ, RZ, Manchester Source coding, ASCII, EBCDIC and baudot code. Channel coding, Error, Causes of error and its effects, error detection & correction using parity, Hamming code & simple numerical.	06	10
05	**Multiplexing and Multiple Access** Need of Multiplexing, TDM, FDM definition block diagram and their comparison.Introduction to WDM Access technique TDMA, FDMA, CDMA (only concepts),advantages of TDMA over FDMA.	06	12
06	**Spread spectrum modulation (Only Descriptive treatment)** Introduction, PN Sequence. Model of spread spectrum modulation system. Direct sequence spread spectrum signal. Frequency hop spread spectrum, slow frequency hopping, and fast frequency hopping. Application S. S. modulations.	06	14
	Total	48	80

List of practicals

1. Observe waveforms of Pulse Amplitude modulation (using natural sampling & flat top sampling).
2. Observe waveforms of Pulse width modulation (using natural sampling & flat top sampling)
3. Observe waveforms of Pulse Position modulation (using natural sampling.
4. Observe waveforms of Pulse code modulation and demodulation.
5. Observe waveforms of Delta modulation.
   Observe waveforms of Adaptive delta Modulation.
   * Observe waveforms with change in amplitude of modulating Signal & Change in Sampling frequency.
6. Observe waveforms of ASK modulation & demodulation.
7. Observe waveforms of FSK modulation & demodulation.
8. Observe waveforms of PSK modulation & demodulation.
9. Observe waveforms of QPSK modulation & demodulation.
10. Observe waveforms of QAM modulation & demodulation.
11. **Any one of the following:**
    1. Error detection & correction using parity bits.
    2. Error detection & correction using hamming codes
    3. To generate following different line codes and decode them.
       1. NRZ (Unipolar) 2. Bipolar NRZ 3. RZ (Unipolar) 4. Bipolar RZ
12. **Any one of the following:**
    1. Time division multiplexing/ de multiplexing system.
    2. Frequency division multiplexing/ de multiplexing system.

Recommended Books:

Sr. No.	Author	Title	Publisher
01	Wayne Tomasi	Electronic communication system	Pearson Education
02	Louis E. Frenzl	Electronics Communication	Tata McGraw Hill
03	Roddy Collen	Communication System	Prentice Hall of India
04	Amitabha Bhattacharya	Digital Communication	Tata McGraw Hill
05	K. Sam. & Shanmugar	Digital & Analog Communication	Jhon wiley & sons
06	B. Sklar	Digital Communication Fundamentals & Applications	Pearson Education
07	Siman Haykin	Digital Communication	Jhon wiley & sons
08	J.S. Chitode	Digital Communication	Technical Publication, Pune
09	Fronuzen	Data Communication Networking	Tata Mc-graw Hill

COURSE NAME : DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : POWER ELECTRONICS

SUBJECT CODE : ET 5004

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
03	02	3	80	20	--	--	25*	125

Pre-requisites :-Before studying this subject the students should have basic understanding & knowledge of:

1) The basic semiconductor theory
2) Working principle of basic electronic devices and circuit

Objectives : -The student will be able to :

1) Draw & explain the V-I characteristics of various power electronic devices\
2) Describe thyristor turn-on & turn-off mechanism
3) Explain working of polyphase rectifiers and their waveforms
4) Explain the working of controlled rectifier

Subject Title : POWER ELECTRONICS	Subject Code: ET-5004

Contents: Theory

Chapter	Name of the Topic	Hours	Marks
01	**Power electronics** Introduction to power electronics. Power transistor: Structure of vertical power transistor, I- V characteristics of power transistors, second breakdown, SOA: Safe operating Area.	**02**	**6**
02	**Thyristor family devices** Brief introduction to Thyristor family devices: TRIAC, SUS, SCS, SBS, LASCR, PUT, GTO. Construction, Symbol, working and static V/I characteristicsof UJT, PUT, SCR, Diac, Triac, IGBT, MOS controlledthyristors, GTO. The two transistor analogy of SCR.	**08**	**20**
03	**Turn ON and Turn OFF methods of Thyristor** Introduction to Turn ON and Turn OFF methods of Thyristor Turn on methods - Forward Voltage triggering, Gate triggering, dv/dt triggering, thermal triggering of Thyristor. Gate trigger circuits - General block diagram of a thyristor gate trigger circuit, Resistance firing circuit, Resistance Capacitance firing circuit, Resistor Capacitor full wave trigger circuit. SCR triggering using UJT, PUT. Synchronised UJT triggering. Thyristor Turn OFF methods - Class A, B, C, D, E, F.	**08**	**20**
04	**Polyphase Rectifiers** Need and Use of Polyphase Rectifiers. Circuit diagram and waveforms of Three phase half wave Delta - Wye rectifier Six phase star half wave rectifier Three phase Delta - Wye Bridge Rectifier	**04**	**10**
05	**Phase controlled Rectifiers** Circuit diagram and waveforms of: Single phase half wave controlled rectifier (one - quadrant) with R, RL load. Effect of free wheeling diode. Single phase full wave controlled rectifier (two - quadrant converters) Midpoint converters (M 2 connection) R, RL load. Effect of free wheeling diode. Bridge configurations (B 2 connection) Fully controlled bridge circuit with inductive load (R L load) Rectifying mode Inverting mode Single Phase half controlled Bridge rectifier Half controlled bridge rectifier with Resistive load Half controlled bridge rectifier with R L load (No mathematical derivations)	**10**	**24**
	Total	**32**	**80**

A) List of Practical :

1) To plot V/I characteristics of Diac.
2) To plot V/I characteristics of Triac.
3) To plot V/I characteristics of SCR.
4) To find out values of latching and Holding current of SCR.
5) To plot V/I characteristics of IGBT.
6) To study SCR phase control circuit.
7) To study full wave mid - point circuit with resistive load.

B) Mini project:

1) Synchronized UJT triggering circuit.
2) Develop light dimmer circuit using diac and Triac.

Umesh Publications

Recommended Books:

Sr. No	Author	Title	Publisher
01	M D Singh K B Khan Chandani	Power Electronics	Tata McGraw-Hill
02	Muhammad H.	Power Electronics	Prentice Hall of India
03	Rashid	Circuits Devices and Applications	Khanna Publishers
04	G K Mithal Dr Manisha Gupta	Industrial and Power Electronics	Dhanpat Rai and Sons
05	S N Biswas Harish C. Rai	Industrial Electronics Industrial and Power Electronics	

COURSE NAME : DIPLOMA IN ELECTRONICS &TELECOMMUNICATION ENGINEERING
COURSE CODE : ET
SEMESTER : FIFTH
SUBJECT TITLE : AUDIO VIDEO ENGINEERING
SUBJECT CODE : ET 5005

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
03	02	3	80	20	--	25**	25*	150

Pre-requisites: The students must have knowledge of the following

1) **Basics of communication system ,such as modulation , EM waves etc**
2) **Working of basic electronics circuits such as amplifiers ,sweep generators, Power supplies etc.**

Objectives: Students should be able to understand:

1) **The basic idea of about the audio amplifier , public address system, graphic equalizer & dolby system**

2) **Monophonic and stereophonic stereo system . comparison between the monophonic and stereophonic systems**

3) **Mechanism of CD player controls available on Cd player & Cd player remote control .fault finding in CD player.**
4) **Monochrome & colour television details and fault findings**
   Explain the concept of cable television and DTH services

Subject Title : AUDIO VIDEO ENGINEERING	Subject Code: ET-5005

Contents:

Theory

	Name of the Topic	Hours	Marks
Unit 01	**Hi Fi Audio Amplifier** Introduction to Amplifiers: Mono, Stereo, Public Address. Difference between stereo amplifier & Mono amplifier. Block diagram of Hi Fi amplifier & explanation Controls available on it & its function & other facility available on it like (Mic in, Aux.in, earphone in) Graphic equalizer concept, circuit diagram and operation. (5 Point Circuit diagram) Dolby NR recording system Types of speaker - its comparison only I) woofer, II) Mid-range, III) Tweeter Cross over network circuit & its function	**04**	**08**
02	**CD player** CD - material used, size Block diagram of CD player & explanation. Principle & working of detection used in CD player. Component used for CD mechanism. I) CD pick-up assembly, II) gear system, III) drive motors, IV) CD lens. Function of controls. Parts, function of remote control (transmitter unit) & function of receiver used in CD player. Advantages of florescent display system used in CD player.	**03**	**08**
03	**TV Fundamentals** Concept & explanation of following: Aspect ratio, image continuity, interlace scanning, scanning periods horizontal & vertical, vertical resolution horizontal resolution. Vestigial sideband transmission, bandwidth for Colour signal, brightness, contrast, viewing distance luminance, hue, saturation, compatibility. Colour theory, primary colors & secondary colors, Grassman's law, additive Colour mixing subtractive Colour mixing. Composite Video Signal explain with waveform: Pedestal height, Blanking pulse, Colour burst, Horizontal sync pulse details, Vertical sync pulse details, Equalizing pulses, CCIR B standards for Colour signal transmission & reception. TV channel allocation for band I & band III.	**06**	**20**

04	**TV Transmitters & Receiver** Audio and Video signal transmission Positive and Negative modulation Merits and Demerits of Negative modulation Introduction to television camera tube (Working & principle only) a) Vidicon b) Plumbicon c) Solid State camera based on CCD. Color Picture tube (working & principle only). a) PIL b) Delta gun picture tube. Block diagram of monochrome TV transmitter (Function of each black) Block diagram of Colour TV transmitter. Block diagram of monochrome TV Receiver.	**06**	**12**
05	**Colour TV and Composite Video Signal** Block Diagram & operation of color TV receiver (PAL D type) , block diagram of PAL-D decoder Explain -Yagi Uda Antenna. with circuit diagram of chroma signal amplifier, Burst pulse blanking, Colour killer control, Basic Circuit for Separation of U & V signals. ACC Amplifier. Coluor signal matrixing, RGB drive amplifiers. EHT generation: circuit explanation for line output stage using transistor or IC in Colour TV. comparisons between NTSC, PAL & SCAM Systems. Explain with Waveform- Pedestal Height,Blanking Pulse,Colour Burst,Horizontal Pulse Sync Details, Vertical Pulse Sync Details,Equalising Pulses,CCIR B Standards for Colour Signal Transmission & Reception.TV Channel Allocation for Band I,III	**09**	**20**
06	**Cable Television** Working Principle and Specification of foll components:- Dish antenna,LNMC,Multiplexer,Attenuators, Connectors (two ways & three ways), Amplifier & cable. MATV, CATV & CCTV. Design concept for cable TV network. Block diagram of dB meter with working principle. Direct to Home System (DTH) Introduction & Block Diagram	**04**	**12**
	. **Total**	**32**	**80**

List of Practical:

1. Study and observe the given component layout of a Hi Fi amplifier system.
    a) Trace the output stage of given Hi Fi amplifier system.
    b) Voltage analysis of a given Hi Fi amplifier.
2. Fault Finding (three different faults) in a Hi Fi Audio amplifier:
    a) By Signal injection method.
    b) Confirmation of faulty stage by voltage analysis method.
3. To plot frequency response of graphic equalizer
4. Draw and study drive mechanism layout of CD Player.
5. Fault finding in CD player (Three different faults)
6. Tracing of chroma section in given TV receiver.
7. Tracing of picture tube and video amplifier in given TV receiver with
8. multimeter.
9. Tracing of horizontal section in given TV receiver with multimeter.
   Voltage analysis of picture tube, chroma section and horizontal section.
10. Fault finding in given Colour TV :
    a) No color b) Red Colour only c) Blue color only d) Green color only.
    e) Magenta color only f) Cyan only g) Yellow only h)No raster. No Sound.
11. a) Fault in HSYNC section.
    b) Fault in VSYNC section.
12. Fault in SYNC separator.
13. Installation of DTH System.
14. Estimate the cost, layour of Cable TV.
15. Collect information about Set Top box used for Cable TV at home.

Recommended Books:

Sr. No.	Author	Title	Publisher
01	A.M Dhake	Television & Radio Engineering	Tata McGraw-Hill
02	R.G Gupta	Television Engg and Video System	Tata McGraw-Hill
03	R.G Gupta	Audio Video Systems	Tata McGraw-Hill
04	R.R Gulati	Modern TV Pratice	New age International
05	S. Sharma	Basic Radio and Television	Tata McGraw-Hill
06	R.R Gulati	Colour Television Principles and Pratice	New age International
07	Bernard Grob	Basic Television and Video System	Tata McGraw-Hill
08	R.R Gulati	Mono Chrome and Colour Television	New age International
09	Manohar Lotia	Modern CD Player Servicing Manual	BPB Publication

COURSE NAME	: DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING
COURSE CODE	: ET
SEMESTER	: FIFTH
SUBJECT TITLE	: MAINTENANCE OF ELECTRONICS EQUIPMENT
SUBJECT CODE	: ET5006

Teaching and Examination Scheme

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
--	03	--	--	--	50**	--	--	50

Pre-requisites: Student should know the following:

1) Basic knowledge of electronic
2) Capable of measuring different parameters using various electronic equipment
3) Concept of troubleshooting
4) Knowledge of fault finding

Objectives: Students should be able to:

1) To develop analysis of circuit working
2) To find equivalent component using datasheets
3) Effective use of service manual and computer
4) Effective use of internet
5) Acquire knowledge about circuit tracing
6) Develop troubleshooting , maintenance and testing knowledge

Subject Title : MAINTENANCE OF ELECTRONICS EQUIPMENT	Subject Code: ET-5006

Contents:

Unit	Name of the Topic	Hours
01	**Reliability aspects of electronic equipment** • Traditional bathtub reliability curve • Generalized reliability curve • Mean time to fail • Failure rate • Mean time between failure • Mean time to repair • Mean time to restore system • Thermal acceleration • Electrical acceleration • Damp heat acceleration • Practical reliability • Quality standards • Maintenance policy • Preventive maintenance • Corrective maintenance Qualitative Maintenance	**04**
02	**Maintenance Management** • Maintenance policy • Equipment service options • Types of contract • General contract provision • Maintenance organization • Training Maintenance Personal • Planning of spare parts inventory • Assessing spare parts requirement • Essentials of a good equipment management programme • Planning for new equipment • Acquisition process • Planning of utilities • Incoming inspection • Inventory control • User training • Technical training • Management of service manual and reference library • Maintenance Arrangement • Calibration Check • Preventive Maintenance • ALERT Issue • Quality Assurance • Installation procedure • Environmental considerations • Humidity • Altitude • Shock and vibrations • Protection from electro-magnetic interference • Safety Service and maintenance laboratory	**10**

Work bench
Power for work bench
Lighting

- Storage
- Maintenance system overview
- Log book
- Performa for recording
- specifications
- Performa for preventive
- maintenance
- Performa for corrective
- maintenance
- Data Analysis
- Information Tags
- Personal Safty

03 **Fundamental Troubleshooting Procedure** **14**

- Reading of block diagram
- Reading of circuit diagram
- Reading of working diagram
- Di-assembly
- Re-assembly
- Trouble shooting process
- Fault establishment
- Fault correction
- Fault finding aids
- Service, Maintenance & Instruction manuals
- Test and measuring Tools
- Pre Trouble shooting technique
- Preliminary observation
- Functional area approach
- Split half method
- Divergent path
- Convergent path
- Feed back path
- Systematic troubleshooting checks
- Check control selting
- Checks associated equipments
- Visual check
- Calibration
- Isolates the troubling circuit
- Measurement
- Individual components

04 **02**

Trouble shooting procedure

1.Visual inspection
2.Measure

Voltage levels
Presence of signal & the signal waveform

3.Component failure

Out of circuit test
In circuit Test

4. Signal Tracing

5.Functional analysis

05	**Trouble shooting aids** **Tools** • Service manual • Circuit diagram • Circuit board location • Voltage analysis • Fault finding flow • check • Diagnostic software List of replace able parts **Data manuals** Trouble shooting technique • Voltage • analysis • Signal injection Signal tracing	**02**
		Total 32

Practical:

1. Testing of resister, capacitor and inductance by using multimeter and LCR meter,
2. CRO.
3. Testing of Transistor by using multimeter and transistor TESTER,CRO
4. Testing of IC using IC tester
5. Testing of variable resisters, connector, switches, by using multimeter. Testing of diodes, zener diode, varactor diode, VDR, Photo diode, Tunnel diode, LDR, Thermister, 7 segment display, FET, MOSFET, SCR, Triac with help of multimeter (testing Zig)
6. LAY OUT OF Components in given power supply
   Tracing of voltage regulation section in given power supply
   Voltage analysis in given power supply
   Fault finding in given power supply by voltage analysis method Fault finding in power supply by voltage analysis method.
7. LAYOUT of components for given function generator
   Tracing of alternation section used in function generator
   Voltage analysis in given function generator
   Fault finding in function generator by voltage analysis method
   Fault finding in function generator by voltage analysis method
   Fault finding in function generator by voltage analysis method.

8. Layout of components for given CRO
   - Tracing a vertical section used in CRO
   - Voltage analysis in CRO
   - Signal Tracing in CRO
   - Fault finding in CRO by voltage analysis method
   - Fault finding in CRO by voltage analysis method
   - Fault finding in CRO by voltage analysis method Fault finding in CRO by signal Tracing method.
9. Visit web site to get information about manufactures, Specification and cost. Which will be filled in tabular form for following measurement and Testing equipment's (ANY 5)

1. logic analyzer
2. logic probe
3. logic pulser
4. logic chip
5. Waveform generator
6. Pattern generator
7. IC Tester
8. Curve Tracer
9. RF power meter
10. Field strength meter
11. Distortion factor meter
12. Accessories for SMD soldering and disordering
13. Soldering & disordering station
14. Digital storage oscilloscope
15. Spectrum analysis

10. Draw the layout with the help of computer
    1. Performa for recording specification in log
    2. look
    3. Performa for preventive maintenance
    4. Performa for corrective maintenance
    5. Performa for data analysis
    6. Layout for service department
    7. Layout for store department
       Layout for servicing table
11. Find equivalent components by using data book/ Internet (at least five components in each type)

    1. Transistors
    2. Diodes
    3. FET/MOSFE
    4. T
    5. IC TTL
       IC CMOS
12. Prepare fault finding flow chart using computer (at least for two faults in each equipments)

    - Power supply
    - Function
    - generator
      CRO

13. Collect the catlog from market/ Internet and write down the information about specification manufacture, cost for the following
(at least five from each group)

(A)

Resister

Capacitor

Inductors

Transformer

Diode

Darlington Tr

FET

MOSFET

IGBT

Photo devices

TTL IC

CMOS IC

Thyristors

LCD Display

LED Display

Microprocessor

Micro controller

Switches

Fuses

IC Sockets

Solder materials

Soldering station

Desolder (widing pump)

heak sink

(B)

Pliers
Cutters
Spanners
(Wrenches)
Screw drivers
Jewelers screw
drivers
Hack jaw
Hand drill & drills
Files
Hand held power tools & whole complement of drilling, grinding, polishing, soldering and cutting
attachment

(C)

Brushes
Blades
Sponge
Inspection mirror
Magnifying glass
Thread
Sleeves

(D)

Contact cleaners
Control cleaners
Lubricants (WD40, LPSI)
Flux remover
Tunner cleaner
Adicheives
Solvent release
Silicon rubber

Industrial Visit:

1. Any service dept. in electronic factory
2. Any service enterprises in your city related with electronic goods.

Recommended Books:

Sr. No.	Author	Title	Publication
01	R.G. Gupta	Electronic Instruments & System	Tata MacGraw Hill
02	R.S. Khandpar	Trouble Shooting Electronic Equipment	Tata MacGraw Hill
03	G.C. Loveday	Electronic Testing & Fault Diagonis	Longman scientific and technical

COURSE NAME : ELECTRONIC & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : Professional Practices-V

SUBJECT CODE : ET 5007

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
--	03	--	--	--	--	--	50*	50

Prerequisites: While selecting candidates a normal practice adopted is to see

1) General confidence and ability to communicate.
2) Basic technological concepts.

Objectives: The student will be able to

1) Acquire information from different sources
2) Prepare notes for given topic
3) Present given topic in a seminar
4) Interact with peers to share thoughts
5) Prepare a report on industrial visit, expert lecture

Subject Title : PROFESSIONAL PRACTICES-V	Subject Code: ET-5007

Units	Activity	Hours
01	**Structured industrial visits shall be arranged and report of the same should be submitted by the individual student, to form a part of the term work.** Following are the suggested type of Industries/ Fields -(Any three visits) i) Data Acquisition System ii) Sugar Mill, Paper Mill, Cement Industry iii) Satellite Earth Station iv) Railway Station Control Room v) Digital RPM Meter Manufacturing Unit vi) Industry where Digital Drives are used vii) Digital Counters	14
02	**The Guest Lecture/s from field/industry experts, professionals to be arranged (2 Hrs), minimum 2 nos. from the following or alike topics. Students should submit a brief report on the guest lecture as part of Term Work** a) Emerging Technology b) Peripheral Devices c) Blue Tooth Technology d) Energy Crisis and Alternative Energy Sources e) Digital Invertors f) Total Quality Management g) Six Sigma	12
03	**Information Search ,data collection and writing a report on the topic** a) CDMA b) GPS c) Manufacturing process of ICs d) WLL Technology	16
04	**Group Discussion**: The students should discuss in group of six to eight students and write a brief report on the same as a part of term work. The topic of group discussions may be selected by the faculty members. Some of the suggested topics are -	10
05	**Seminar :** Seminar topic should be related to the subjects of fifth semester Each student shall submit a report of 5 to10 pages and deliver a seminar (Presentation time - 10 minutes)	12
		Total =64

COURSE NAME : ELECTRONICS & TELECOMMUNICATION ENGINEERING

COURSE CODE : ET

SEMESTER : FIFTH

SUBJECT TITLE : INDUSTRIAL PROJECT AND ENTREPRENEURSHIP DEVELOPMENT

SUBJECT CODE :ET 5008

Teaching and Examination Scheme:

Teaching Scheme		Examination Scheme						
TH	PR	Paper Hrs	TH	INT	PR	OR	TW	TOTAL
01	02	--	--	--	--	--	25*	25

1. **Form project batches & allot project guide to each batch. (Max. 4 students per batch)**
2. **Each project batch should select topic / problem / work by consulting the guide & / orindustry. Topic / Problem / work should be approved by Head of department.**
3. **Each project batch should prepare action plan of project activities & submit the same to respective Guide**
4 **At the end of semester, each project batch should submit the action plan and abstract of the**
5. **project along with list of materials required if project involves fabrication or other facilitiesrequired in other kinds of project.Action Plan should be part of the project report.**

Notes:

1. **One theory and Two practical hours are for Building Services and Oral based on term work**
2. **One theory and one tutorial hour are for Entrepreneurship Development (EDP). Twenty five marks for term work are for report prepared under EDP**

Content:

Part A) Industrial Project

Following activities related to project are required to be dealt with, during this semester.

1) Knowledge of" principles of manangement" is required

Objectives:Student will be able to

1) Indentify entrepreneurship opportunity
2) Acquire entrepreneurial values and attitude
3) Use the information to prepare project report for business venture
4) Develop awareness about enterprise management

Subject Title : Industrial Project And Entrepreneurship Development	Subject Code: ET-5008

Contents: Theory

Contents: Theory

Unit	Name of the Topic	Hours
01	**Entrepreneurship, Creativity & Opportunities** Concept, Classification & Characteristics of Entrepreneur Creativity and Risk taking.Concept of Creativity & Qualities of Creative person.Risk Situation, Types of risk & risk takers. Business Reforms.Process of Liberalization.Reform Policies. Impact of Liberalization Emerging high growth areas. Business Idea Methods and techniques to generate business idea. Transforming Ideas in to opportunities transformation involves Assessment of idea &Feasibility of opportunity SWOT Analysis	**03**
02	**Information And Support Systems** Information Needed and Their Sources.Information related to project, Information related to support system,Information related to procedures and formalities SUPPORT SYSTEMS Small Scale Business Planning, Requirements.Govt. & Institutional Agencies, Formalities Statutory Requirements and Agencies.	**03**
03	**Market Assesment** Marketing -Concept and Importance Market Identification, Survey Key components Market Assessment	
04	**Business Finance & Accounts**	**02**
1 2	**Business Finance** Cost of Project • Sources of Finance • Assessment of working capital • Product costing • Profitability • Break Even Analysis • Financial Ratios and Significance	**03**
06	**Business Account** Accounting Principles, Methodology 1) Book Keeping 2) Financial Statements 3) Concept of Audit,	

05	**Business Plan & Project Report** Business plan steps involved from concept to commissioning- Activity Recourses, Time, Cost **Project Report** 1) Meaning and Importance 2) Components of project report/profile **(Give list**) **Project Apprisial** 1) Meaning and definition 2) Technical, Economic feasibility 3) Cost benefit Analysis	**03**
06	**Enterprise Management And Modern Trends** **Enterprise Management**: 1) Essential roles of Entrepreneur in managing enterprise 2) Product Cycle: Concept And Importance 3) Probable Causes Of Sickness 4) Quality Assurance : Importance of Quality, Importance of testing **E-Commerce** Concept and process **Global Entrepreneur**	**02**
	Total	**16**

Assignments

Assess yourself-are you are entrepreneur?
Prepare project report and study its feasibility

Recommended Books:

Sr.No	**Author**	**Name Of Book**	**Publisher**
1	J.S. Saini B.S.Rathore	Entrepreneurship Theory and Practice	Wheeler Publisher Himalaya Publishing.
2	E. Gorden K.Natrajan	Entrepreneurship Development	
3	Preferred by Colombo Plan Staff College for Technician Education.	Entrepreneurship Development	Tata Mc Graw Hill
4	J.B.Patel D.G.Allampally	A Manual on How to Prepare a Project Report	EDI STUDY MATERIAL Ahmadabad (Near Village)
5	J.B.Patel S.S.Modi	A Manual on Business Opportunity Identification & Selection	Bhat , Via Ahmadabad

6	S.B.Sareen H. Anil Kumar	National Derectory of Entrepreneur Motivator & Resource Persons.	Airport & Indira Bridge), P.O. Bhat 382428 , Gujrat,India P.H. (079) 3969163, 3969153 E-mail : ediindia@sancharnet.in/olp e@ediindia.org Website : http://www.ediindia.org
7	Gautam Jain Debmuni Gupta	New Initiatives in Entrepreneurship Education & Training	
8	P.C.Jain	A Handbook of New Enterpreneurs	
9	D.N.Awasthi , Jose Sebeastian	Evaluation of Enterpreneurship Development Programmes	
10	V.G.Patel	The Seven Business Crisis & How to Beat Them.	

2) Video Cassettes

NO	SUBJECT	SOURCE
1	Five success Stories of First Generation Entrepreneurs	EDI STUDY MATERIAL Ahmadabad (Near Village Bhat , Via Ahmadabad Airport & Indira Bridge), P.O. Bhat 382428 , Gujrat,India P.H. (079) 3969163, 3969153 E-mail : ediindia@sancharnet.in/olpe@ediindia.org Website : http://www.ediindia.org
2	Assessing Entrepreneurial Competencies	
3	Business Opportunity Selection and Guidance	
4	Planning for completion & Growth	
5	Problem solving-An Entrepreneur Skill	

Components of Project Report:

1. Project Summary (One page summary of entire project)
2. Introduction (Promoters, Market Scope/ requirement)
3. Project Concept & Product (Details of product)
4. Promoters (Details of all Promoters- Qualifications, Experience, Financial
5. strength)
6. Manufacturing Process & Technology
7. Plant & Machinery Required
8. Location & Infrastructure required
9. Manpower (Skilled, unskilled)Raw materials, Consumables & Utilities
10. Working Capital Requirement(Assumptions,requirements) 11. Market (Survey, Demand & Supply)
12. Cost of Project, Source of Finance
13. Projected Profitability & Break Even Analysis
14. Conclusion.