



SCHEME FOR FIFTH SEMESTER (ELECTRONICS & COMMUNICATION ENGINEERING)

Sr. No.	Subject	Study Scheme			EVALUATION SCHEME						Total Marks
					INTERNAL ASSESSMENT		EXTERNAL ASSESMENT (EXAMINATION)				
		Theory	Practical	Written Paper		Practical					
		Max. Marks	Max. Marks	Max. Marks	Hrs.	Max. Marks	Hrs.				
5.1*	Environmental Education	3	-	-	50	-	100	3	-	-	150
5.2	Consumer Electronics	3	-	3	25	25	100	3	50	3	200
5.3	Microwave and Radar Engineering	3	-	3	25	25	100	3	50	3	200
5.4**	Optical Fiber Communication	3	-	3	25	25	100	3	50	3	200
5.5	Power Electronics	3	-	3	25	25	100	3	50	3	200
5.6	Trouble Shooting of Electronics Equipment	-	-	6	-	50	-	-	100	3	150
5.7*	Employability Skills - I	-	-	2	-	25	-	-	50	3	75
5.8	Industrial Training	-	-	-	-	50	-	-	50	3	100
# Student Centred Activities including Personality Development Camp		-	-	5	-	25	-	-	-	-	25
Total		15	-	25	150	250	500	-	400	-	1300

* Common with other diploma programmes

** Common with diploma programme in Electronics (Power Electronics)

Student Centred Activities will comprise of co-curricular activities like extension lectures, library studies, games, hobby clubs e.g. photography, painting, singing, seminars, declamation contests, educational field visits, N.C.C., NSS, Cultural Activities, Civil Defence/Disaster Management activities etc.

Industrial Training - After examination of 4th Semester, the students shall go for training in a relevant industry/field organization for a minimum period of 6 weeks and shall prepare a diary. It shall be evaluated during 5th semester by his/her teacher for 50 marks. The students shall also prepare a report at the end of training and shall present it in a seminar, which will be evaluated for another 50 marks. This evaluation will be done by HOD and lecturer incharge – training in the presence of one representative from training organization.



PM

POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

SYLLABUS: Polytechnic (ECE)

Department: Electronics & Communication Engineering – 5th Semester

Subject: Environmental Education (Theory)

Subject Code: 120151

Detailed Contents

Unit No. 1 Introduction

- Topic No.1: Definition
- Topic No.2: Scope
- Topic No.3: Importance of Environmental Education

Unit No. 2

- Topic No.4: Basics of ecology, Biodiversity
- Topic No.5: Eco system and Sustainable development

Unit No. 3

- Topic No.6: Sources of pollution - natural and manmade, Causes
- Topic No.7: Effects and control measures of air pollution and their units of measurement
- Topic No.8: Effects and control measures of water pollution and their units of measurement
- Topic No.9: Effects and control measures of noise pollution and their units of measurement
- Topic No.10: Effects and control measures of soil pollution and their units of measurement
- Topic No.11: Effects and control measures of radioactive pollution and their units of measurement
- Topic No.12: Effects and control measures of nuclear pollution and their units of measurement

Unit No. 4

- Topic No.13: Solid waste management, Causes, Effects
- Topic No.14: Control measures of urban and industrial waste

Unit No. 5

- Topic No.15: Mining - Causes, effects and control measures
- Topic No.16: Deforestation – Causes, effects and control measures

Unit No. 6

- Topic No.17: Environmental Legislation - Water (prevention and control of Pollution) Act 1974
- Topic No.18: Air (Prevention and Control of Pollution) Act 1981
- Topic No.19: Environmental Protection Act 1986
- Topic No.20: Role and Function of State Pollution Control Board,
- Topic No.21: Environmental Impact Assessment (EIA)

Unit No. 7

- Topic No.22: Role of Non-conventional Energy Resources-Solar Energy
- Topic No.23: Wind Energy, Bio Energy, Hydro Energy

Unit No. 8

- Topic No.24: Current Issues in Environmental Pollution – Global Warming
- Topic No.25: Green House Effect, Depletion of Ozone Layer
- Topic No.26: Recycling of Material, Environmental Ethics
- Topic No.27: Rain Water Harvesting, Maintenance of Groundwater
- Topic No.28: Acid Rain, Carbon Credits

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	50	-	100	3	-	-	150



PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

RECOMMENDED BOOKS

1. Environmental Engineering and Management by Suresh K Dhameja; SK Kataria and Sons, New Delhi.
2. Environmental Science by Dr. Suresh K Dhameja; SK Kataria and Sons, New Delhi.
3. Environmental and Pollution Awareness by Sharma BR; Satya Prakashan, New Delhi.
4. Environmental Protection Law and Policy in India by Thakur Kailash; Deep and Deep Publications, New Delhi.
5. Environmental Science by Deswal and Deswal; Dhanpat Rai and Co. (P) Ltd. Delhi.
6. Engineering Chemistry by Jain and Jain; Dhanpat Rai and Co. (P) Ltd. Delhi.
7. Environmental Studies by Erach Bharucha; UGC University Press

INSTRUCTIONAL STRATEGY

The contents will be covered through lecture cum discussion sessions. In addition, in order to have more appreciation of need for protection of environment, it is suggested that different activities pertaining to Environmental Education like video films, seminars, environmental awareness camps and expert lectures may also be organized.

SUGGESTED DISTRIBUTION OF MARKS

Sr.No.	Unit No.	Time Allotted (Hrs)	Marks Allotted (%)
1	1	02	04
2	2	03	06
3	3	12	24
4	4	06	12
5	5	04	10
6	6	10	20
7	7	04	10
8	8	07	14
Total		48	100



Detailed Contents

Unit No.1 Audio Systems

Topic No.1: Microphones and Loudspeakers, Carbon, moving coil, cordless microphone, direct radiating and horn Loudspeaker

Topic No.2: Multi-speaker system

Topic No.3: Sound Recording- Magnetic Recording, Digital Recording

Topic No.4: Optical Recording (CD system and DVD)

Unit No. 2 Television

Topic No.5: Monochrome TV

Topic No.6: Elements of TV communication system

Topic No.7: Scanning and its need

Topic No.8: Need of synchronizing and blanking pulses, VSB

Topic No.9: Composite Video Signal

Topic No.10: Picture Tube

Topic No.11: Camera Tube-Vidicon and Plumbicon

Topic No.12: TV Receiver-Block diagram, function of each block, waveform at input and output of each block.

Topic No.13: Colour Television-Primary, secondary colours, Concept of Mixing, Colour Triangle

Topic No.14: Camera tube

Topic No.15: PAL TV Receiver, Concept of Compatibility with Monochrome Receiver

Topic No.16: NTSC, PAL, SECAM system (brief comparison)

Unit No. 3 LCD and LED Television:

Topic No.17: Basic principle and working of LCD and LED TV

Unit No. 4 Cable Television:

Topic No.18: Working of Cable TV

Topic No.19: DTH

Topic No.20: HDTV

Unit No. 6 Electronics Gadgets:

Topic No.21: Principle, Working and troubleshooting with special emphasis on control panel Scanner

Topic No.22: Digital Camera

Topic No.23: VCD/DVD

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External Assessment (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	

RECOMMENDED BOOKS

1. Audio and Video Systems by RG Gupta, Tata McGraw Hill Education Pvt Ltd, New Delhi
2. Colour Television-Principles and Practice by R.R Gulati , Wiley Eastern Limited, New Delhi
3. Complete Satellite and cable Television R.R Gulati New age International Publisher, New Delhi
4. Colour Television Servicing by RC Vijay BPB Publication, New Delhi
5. Colour Television and Video Technology by A.K. Maini CSB Publishers
6. Consumer Electronics Yagnik & Jain by Ishan Publication, Ambala.
7. Colour TV by A.Dhake
8. Service Manuals, BPB Publication, New Delhi



PM POLYTECHNIC

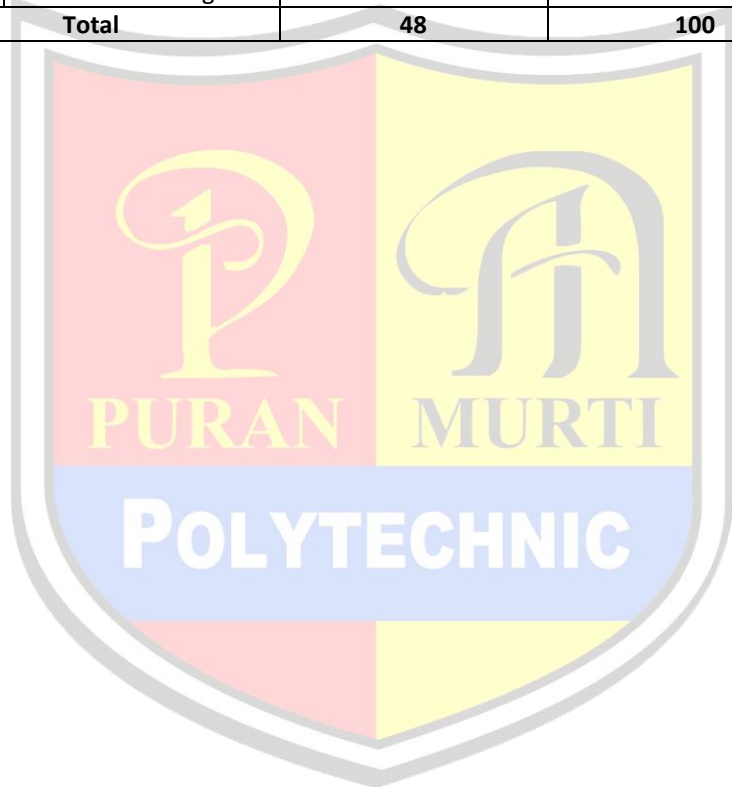
A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

INSTRUCTION STRATEGY

This subject gives the knowledge of the various day-to-day life electronic products. So, the teacher is required to show and demonstrate the gadgets and impart practical knowledge to the students. For that one should give home assignment and frequent industrial visit should be there. Visit to TV studio and TV transmitter station should be arranged to give a practical exposure to the students.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Audio System	08	15
2	Television	24	50
3	LCD and LED TV	04	10
4	Cable Television	04	10
5	Electronics Gadgets	08	15
Total		48	100





PM

POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

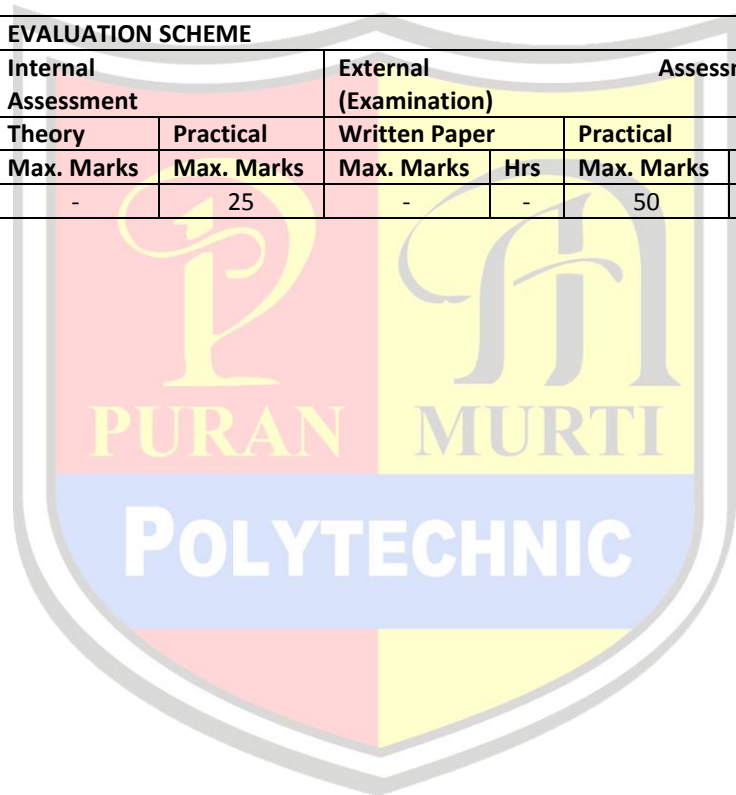
Subject: Consumer Electronics (Practical)

Subject Code: 121052(P)

LIST OF PRACTICALS

1. To plot the frequency response of a Microphone
2. To plot the frequency response of a Loud Speaker
3. Trouble shooting of CD/DVD Player
4. To observe the wave forms and measure voltage of B/W TV Receiver at different points.
5. To observe the waveforms and measure voltages of colour TV Receiver at different points.
6. Fault finding of colour T.V
7. Demonstration and Operation of following.
 - (a) DTH System
 - (c) Scanner

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





PM
POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Microwave & Radar Engineering (Theory)

Subject Code: 121053

Detailed Contents

Unit No.1 Introduction to Microwaves

- Topic No. 1: Introduction to microwaves and its applications
- Topic No.2: Classification on the basis of its frequency bands
- Topic No. 3: (HF, VHF, UHF, L, S, C, X, KU, KA, mm, SUB, mm)

Unit No.2 Wave guides

- Topic No. 4: Rectangular and circular wave guides and their applications
- Topic No. 5: Mode of waveguide
- Topic No. 6: Propagation constant of a rectangular wave guide
- Topic No. 7: Cut off wavelength
- Topic No. 8: Guide wavelength and their relationship with free space wavelength (no mathematical derivation)
- Topic No. 9: Impossibility of TEM mode in a wave guide.

Unit No.3 Microwave Components

- Topic No. 10: Constructional features, characteristics and application of tees, bends, matched termination, twists
- Topic No. 11: Detector, mount, slotted section, directional coupler, fixed and variable attenuator,
- Topic No. 12: Isolator, circulator and duplex
- Topic No. 13: Coaxial to wave guide adapter

Unit No.4 Microwave Devices

- Topic No. 14: Basic concepts of thermionic emission
- Topic No. 15: Vacuum tubes
- Topic No. 16: Effects of inter-electrode capacitance
- Topic No. 17: Lead Inductance and Transit time on the high frequency performance of conventional vacuum tubes
- Topic No. 18: Steps to extend their high frequency operations.
- Topic No. 19: Construction, characteristics, operating principles and applications of the following devices -
Multicavity Klystron, Reflex klystron
- Topic No. 20: Multi-cavity magnetron, traveling wave tube
- Topic No. 21: Gunn diode and Impatt diode

Unit No.5 Microwave antennas

- Topic No. 22: Structure characteristics of Horn antenna
- Topic No.23: typical applications of Horn antenna
- Topic No. 24: Dish antenna

Unit No.6 Microwave Communication systems

- Topic No.25: Block diagram and working principles of microwave communication link
- Topic No.26: Troposcatter Communication: Troposphere and its properties
- Topic No. 27: Tropospheric duct formation and propagation, troposcatter propagation

Unit No.7 Radar Systems

- Topic No. 28: Introduction to radar, its various applications
- Topic No. 29: Radar range equation and its applications
- Topic No. 30: Block diagram and operating principles of basic pulse radar
- Topic No. 31: Ambiguous range, radar area of cross-section and its Dependence on frequency
- Topic No. 32: Block diagram and operating principles of CW (Doppler) and FMCW radars and their applications
- Topic No. 33: Block diagram and operating principles of MTI radar
- Topic No. 34: Radar display- PPI

Unit No.8 Introduction to VSAT

- Topic No. 35: VSAT transponders multiple access techniques
- Topic No. 36: VSAT and its features



STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-		25	-	100	3	-	-	125

RECOMMENDED BOOKS

1. Microwave Devices and Components by Sylio, Prentice Hall of India, New Delhi
2. Communication System by Sanjay Sharma
3. Microwave & Radar Engg. by Navneet Arora, Ishan publication, Ambala
4. Electronics Communication by Roddy and Coolen
5. Electronics Communication System by KS Jamwal, Dhanpat Rai and Sons, Delhi
6. Microwave Engineering by Das, Tata McGraw Hill Education Pvt Ltd , New Delhi

INSTRUCTIONAL STRATEGY

Microwave and radar is a very important subject and requires both theoretical as well as practical exposure. The teaching should be supplemented by visits to the microwave stations and using suitable audio visual aids.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr. No	Unit Name	Time Allotted (Hrs)	Marks Allotted (%)
1	Introduction to Microwaves	02	5
2	Wave guides	06	10
3	Microwave Components	08	15
4	Microwave Devices	10	20
5	Microwave antennas	04	10
6	Microwave Communication systems	08	15
7	Radar Systems	08	15
8	Introduction to VSAT	02	10
Total		48	100



PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Microwave & Radar Engineering (Practical)

Subject Code: 121053(P)

LIST OF PRACTICALS

1. To measure electronics and mechanical tuning range of a reflex klystron.
2. To measure VSWR of a given load.
3. To measure the Klystron frequency by slotted section method.
4. To measure the directivity and coupling of a directional coupler.
5. To plot radiation pattern of a horn antenna in horizontal and vertical planes.
6. To verify the properties of magic tee.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





Detailed Contents

Unit No. 1 Introduction

- Topic No.1: Historical Perspective
- Topic No.2: Basic communication systems
- Topic No.3: Optical frequency range
- Topic No.4: Advantages of optical fiber communication
- Topic No.5: Application of fiber optic communication
- Topic No.6: Electromagnetic spectrum used advantages and disadvantages
- Topic No.7: Principle of light reflection
- Topic No.8: Principle of reflection
- Topic No.9: Principle of critical angle

Unit No.2 Optical Fibers and Cables

- Topic No.10: Fiber types construction
- Topic No.11: Multimedia and monomodes
- Topic No.12: Step index and graded index fibers
- Topic No.13: Acceptance angle and acceptance types of optical fiber cable

Unit No. 3 Losses in Optical Fiber Cable

- Topic No.14: Absorption Losses, Scattering Losses, Radiation Losses, Compelling Losses, Bending losses
- Topic No.15: Dispersion
- Topic No.16: Material Dispersion
- Topic No.17: Wave Guide Dispersion
- Topic No.18: Modal Dispersion, Total Dispersion and Bit Rate

Unit No. 4 Light Sources and Detectors

- Topic No.19: Characteristics of Light source used in optical communication
- Topic No.20: principle of Operation of LED, Different Types of LED Structures Used and their Brief description
- Topic No.21: LED driving Circuitry, Injection Laser Diode, Principle of operation, Different injection laser diode
- Topic No.22: Comparison of LED and ILD, Non Semiconductor Laser
- Topic No.23: Characteristics of Photo detectors used in optical Communication
- Topic No.24: Pin Code Diode and avalanche photo diode (APD) -Their Brief description

Unit No.5 Connectors Splicing and Coupling

- Topic No.25: Fiber alignment and joint losses
- Topic No.26: Splicing, Types of slices, Types of connectors used
- Topic No.27: Couplers, Three and four port coupler, Star coupler
- Topic No.28: Fiber optic switch

Unit No.6 Optical Fiber System

- Topic No.29: Optical transmitter circuit
- Topic No.30: Optical receiver circuit
- Topic No.31: Optical power budgeting
- Topic No.32: Multiplexing methods used
- Topic No.33: Modulation methods used
- Topic No.34: Introduction OF SDH, Introduction OF SONET

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125



PM POLYTECHNIC

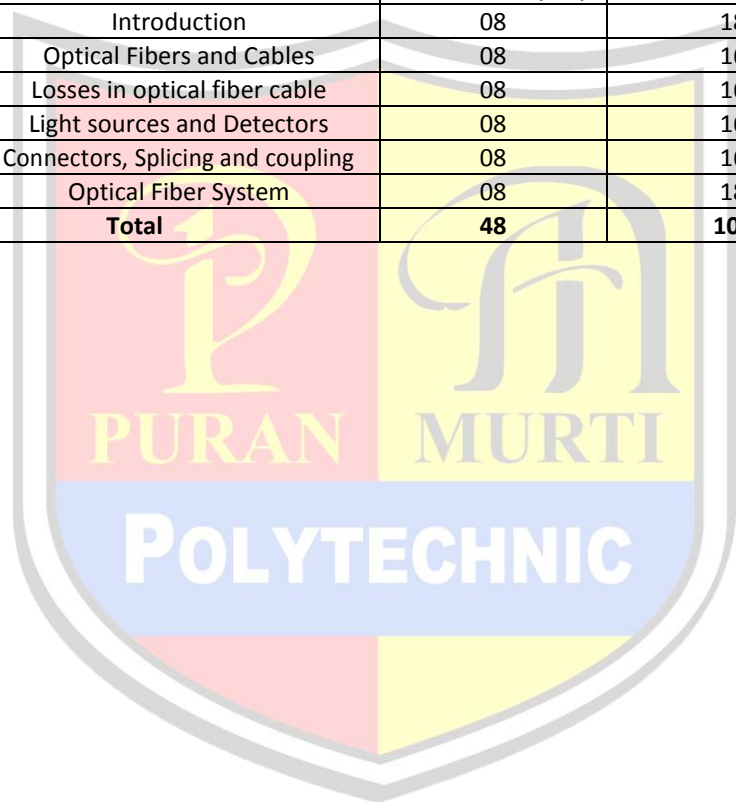
A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

RECOMMENDED BOOKS

1. Optical fiber Communication by John M Senior, Prentice Hall of India, New Delhi
2. Optical fiber Communication by J. Gower , Prentice Hall of India, New Delhi
3. Optical fiber Communication by ' Gerd Keiser, McGraw Hill International Editions
4. Optical fiber Communication by Yashpal & Sanjeev Kumar, North Publication, Ambala
5. Optical Communications – Components and Systems by JH Franz and VK Jain, Narosa Publishing House, New Delhi
6. Optical fiber Communication Systems by GP Agrawal, John Wiley and Sons, New Delhi
7. Optical fiber Communication and its Applications by S C Gupta, Prentice Hall of India, New Delhi
8. Optical fiber communication by R.K. Gautam, King India Published Ltd. New Delhi

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr. No	Unit Name	Time Allotted (Hrs)	Marks Allocation%
1	Introduction	08	18
2	Optical Fibers and Cables	08	16
3	Losses in optical fiber cable	08	16
4	Light sources and Detectors	08	16
5	Connectors, Splicing and coupling	08	16
6	Optical Fiber System	08	18
	Total	48	100





PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

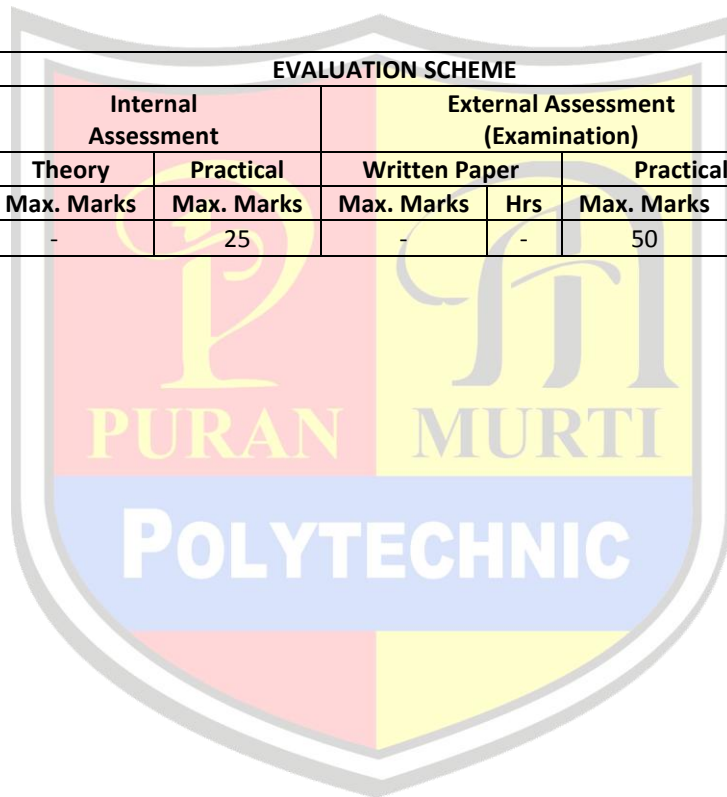
Subject: Optical Fiber Communication (Practical)

Subject Code: 121054(P)

LIST OF PRACTICALS

1. Setting up of fiber analog link
2. Setting up to optic digital link
3. Measurement of various losses in optical fibers
4. To observe and measure the splice or connector loss
5. To measure and calculate numerical aperture of optical fiber
6. To observe characteristics of optical source
7. To observe characteristics of optical deflector
8. To Connectorise a fiber with connector at both ends
9. Introduction to various components and tools used in optical fiber communication
10. A visit to nearby Telephone Exchange

STUDY SCHEME		EVALUATION SCHEME							Total Marks
		Internal Assessment		External Assessment (Examination)					
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks		Hrs
-	-	3	-	25	-	-	50	3	75





Detailed Contents

Unit No.1 Introduction to thyristors and other Power Electronics Devices

Topic No.1: Introduction to SCR-Construction, Working principle of SCR, two transistor analogy of SCR, V-I Characteristics of SCR.

Topic No.2: SCR specifications and ratings.

Topic No.3: Different methods of SCR triggering.

Topic No.4: Different commutation circuits for SCR.

Topic No.5: Series and parallel operation of SCR

Topic No.6: Construction and working principle of DIAC, TRIAC and their V-I characteristics

Topic No.7: Construction, working principle of UJT, V-I characteristics of UJT, UJT as relaxation oscillator

Topic No.8: Brief introduction to Gate Turn off thyristor (GTO), Programmable Uni-junction Transistor (PUT), MOSFET.

Topic No.9: Basic idea about the selection of Heat sink for thyristors.

Topic No.10: Applications such as light intensity control, speed control of universal motors, fan regulator, battery charger.

Unit No.2 Controlled Rectifiers

Topic No.11: Single phase half wave controlled rectifier with load (R, R-L) Single

Topic No.12: Single phase half controlled full wave rectifier with load (R, R-L)

Topic No.13: Fully controlled full wave bridge rectifier

Topic No.14: Single phase full wave centre tap rectifier.

Unit No.3 Inverters, Choppers, Dual Converters and Cycloconverters.

Topic No.15: Principle of operation of basic inverter circuits, concepts of duty cycle, series and parallel Inverters and Their Applications.

Topic No.16: Choppers: Introduction, types of choppers (Class A, Class B, Class C and Class D). Step up and step down Choppers.

Topic No.17: Dual Converters and cycloconverters: Introduction, types and basic working principle of dual Converters and cycloconverters and their applications.

Unit No.4 Thyristorised Control of Electric drives

Topic No.18: DC drive control - Half wave drives, Full wave drives, Chopper drives (Speed control of DC motor using Choppers)

Topic No.19: AC drives control- Phase control, Constant V/F operation, Cycloconverter/Inverter drives.

Unit No.5 Uninterrupted Power Supply (UPS)

Topic No.20: UPS: Block Diagram & specifications of on-line, off line and Smart UPS.

STUDY SCHEME		EVALUATION SCHEME						Total Marks	
		Internal Assessment		External Assessment (Examination)					
Hrs/week		Theory	Practical	Written Paper		Practical			
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
3	-	-	25	-	100	3	-	-	125

RECOMMENDED BOOKS

- 1) Power Electronics by P.C. Sen, Tata Mc Graw Hill Education Pvt Ltd. New Delhi
- 2) Power Electronics by P.S. Bhimbhra, Khanna Publishers, New Delhi
- 3) Power Electronics – Principles and Applications by Vithayathi, Tata Mc Graw Hill Education Pvt Ltd. New Delhi
- 4) Power Electronics by Sanjay Puri & Chopra North Publication, Ambala
- 5) Power Electronics by M.S. Berde, Khanna Publishers, New Delhi.
- 6) Power Electronics by MH Rashid
- 7) Industrial Electronics and Control by SK Bhattacharya and S. Chatterji, New Age Publications. New Delhi



PM POLYTECHNIC

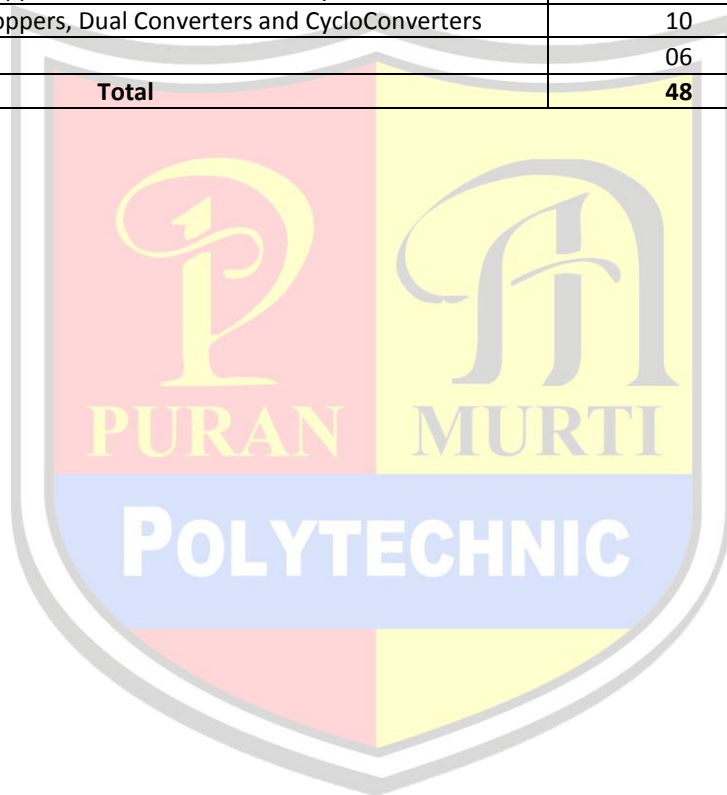
A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

INSTRUCTIONAL STRATEGY

Power Electronics being very important for industrial controls requires a thorough know how about industrial devices. Teacher should take to the class various SCRs and other semiconductor devices to demonstrate these to the students. The teacher may encourage students to perform practical simultaneously for better understanding of the subject and verification of theoretical concepts. So industrial visit in between the course is a must.

SUGGESTED DISTRIBUTION OF MARKS FOR FACILITATING PAPER SETTER

Sr.No.	Unit Name	Time Allotted (Hrs)	Marks Allotted%
1	Introduction to thyristors and other power electronics devices	13	30
2	Controlled Rectifier	07	15
3	Inverters, Choppers, Dual Converters and Cyclo. Converters	12	25
4	Inverters, Choppers, Dual Converters and CycloConverters	10	20
5	UPS	06	10
Total		48	100





PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

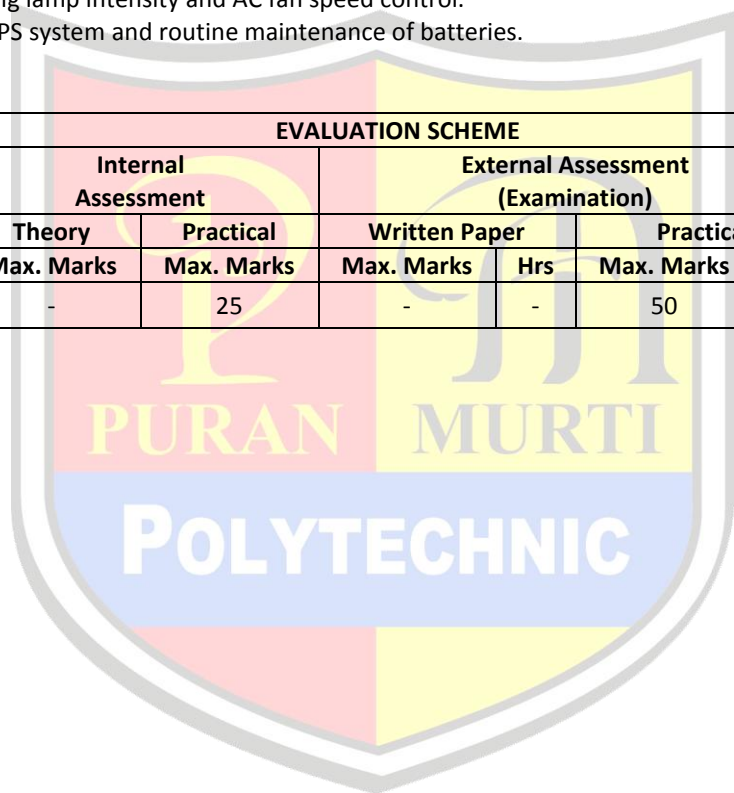
Subject: Power Electronics (Practical)

Subject Code: 121055(P)

LIST OF PRACTICALS

- 1) To plot V-I characteristic of an SCR.
- 2) To plot V-I characteristics of TRIAC.
- 3) To plot V-I characteristics of UJT.
- 4) To plot V-I characteristics of DIAC.
- 5) Study of UJT relaxation oscillator. And observe I/P and O/P wave forms
- 6) Observation of wave shape of voltage at relevant point of single-phase half wave controlled rectifier and effect of change of firing angle.
- 7) Observation of wave shapes of voltage at relevant point of single phase full wave controlled rectifier and effect of change of firing angle.
- 8) Observation of wave shapes and measurement of voltage at relevant points in TRIAC based AC phase control circuit for Varying lamp intensity and AC fan speed control.
- 9) Installation of UPS system and routine maintenance of batteries.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	3	-	25	-	-	50	3	75





Detailed Contents

Unit No. 1 Repair, Servicing and Maintenance Concepts

Topic No. 1: Introduction, Modern electronic equipment, Mean time between failures (MTBF), Mean time to repair (MTR), Maintenance policy, potential problems, preventive maintenance, corrective maintenance.

Topic No. 2: Study of basic procedure of service and maintenance

Topic No. 3: Circuit tracing techniques

Topic No. 4: Concepts of shielding, grounding and power supply considerations in instruments.

Unit No.2 Fundamental Trouble Shooting Procedures

Topic No. 5: Fault location

Topic No. 6: Fault finding aids-Service manuals, Test and measuring instruments, special tools

Topic No. 7: Trouble Shooting Techniques- Functional Areas Approach, Split half method, Divergent, convergent and feedback path circuit analysis, Measurement techniques

Unit No.3 Mobile Phones

Topic No. 8: Identification of various parts of mobile phones

Topic No. 9: Repair and maintenance of mobile phones

Topic No. 10: Software installation in mobile phones

Topic No. 11: Common faults

Unit No.4 Trouble shooting and maintenance

Topic No. 12: Trouble shooting and maintenance of testing equipment like C.R.O , function generator

Topic No. 13: power supplies and other measuring devices

Topic No. 14: detailed discussion about trouble shooting of medical, electronic equipment like, ECG, EEG, Ultra sound.

Topic No. 15: Repair and maintenance and exposure of medical electronics equipment through industrial visits.

Unit No.5 Troubleshooting Digital Systems

Topic No. 16: Typical faults in digital circuits. Use of logic clip,

Topic No. 17: logic pulsar, IC tester

Unit No.6 Demonstration and practical

Topic No. 18: Demonstration and practical to be performed on following groups of Electronic equipment, with Compulsory visit to low service centre.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment			External Assessment (Examination)			
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	6	-	50	-	-	100	3	150

RECOMMENDED BOOKS

1. Modern Electronic Equipment Trouble shooting, Repair and Maintenance by RS Khandpur, Tata McGraw Hill Education Pvt Ltd, New Delhi.
2. Troubleshooting and maintenance of Electronics Equipment by Manoj Kumar, Satya Parkashan



PM POLYTECHNIC

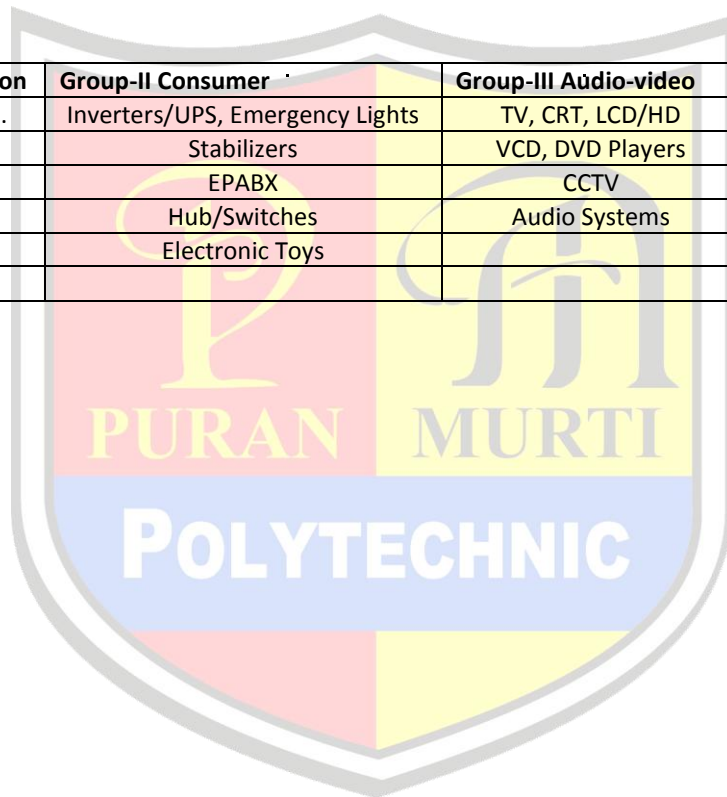
A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

LIST OF PRACTICALS

1. Demonstration and practice of fault finding and repair of:
 - (a) C.R.O
 - (b) Function Generator
 - (c) Power supplies
 - (d) Digital multimeter
2. Demonstration, practice of fault finding and repair of any one equipment from group-I i.e. Communication
3. Demonstration, practice of fault finding and repair of any one equipment from group-II i.e. Consumer
4. Demonstration, practice of fault finding and repair of any one equipment from group-III i.e. Audio/Video systems
5. Demonstration, practice of fault finding and repair of any one equipment from group IV i.e. Computer
6. Testing of Integrated Circuits (ICs)
7. Use of digital tools for troubleshooting digital equipments

Choice of one equipment from each group is compulsory.

Group-I Communication	Group-II Consumer	Group-III Audio-video	Group-IV Computer
Telephone Handsets.	Inverters/UPS, Emergency Lights	TV, CRT, LCD/HD	Monitor
Cordless Phones	Stabilizers	VCD, DVD Players	Printer (Laser)
Fax Machine	EPABX	CCTV	Printer (Inkjet)
Modem	Hub/Switches	Audio Systems	Scanner
Walkie / Talkie	Electronic Toys		Keyboard, Mouse
			Video Games





PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Employability Skills – I (Internal)

Subject Code: Emp.Skill -1(P)

Detailed Contents

Unit No.1 writing skills

- Topic No. 1: Official and business correspondence
- Topic No. 2: Job application - covering letter and resume
- Topic No. 3: Report writing - key features and kinds

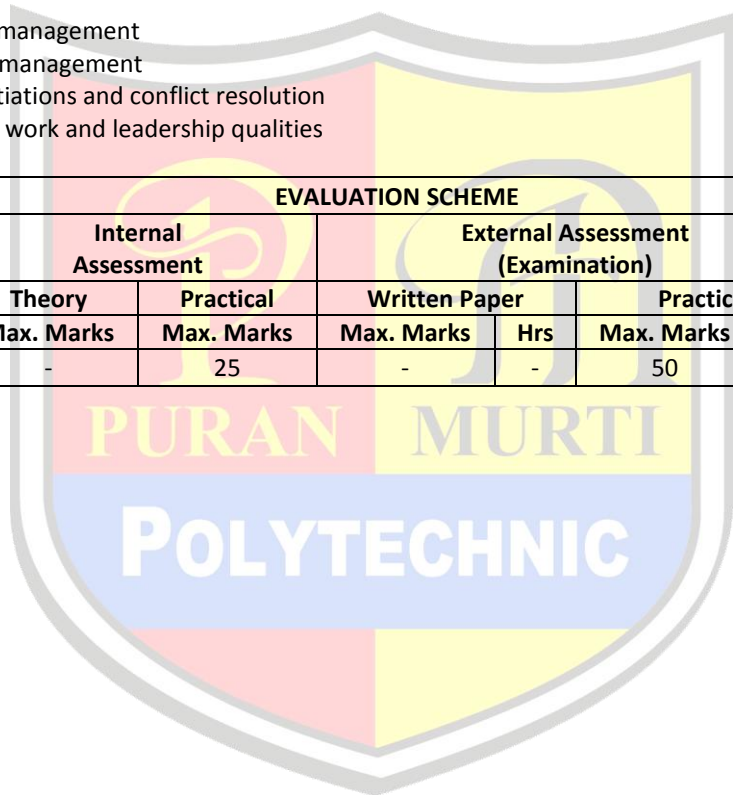
Unit No.2 Oral Communication Skill

- Topic No. 4: Giving advice
- Topic No. 5: Making comparisons
- Topic No. 6: Agreeing and disagreeing
- Topic No. 7: Taking turns in conversation
- Topic No. 8: Fixing and cancelling appointments

Unit No.3 Generic Skills

- Topic No. 9: Stress management
- Topic No. 10: Time management
- Topic No. 11: Negotiations and conflict resolution
- Topic No. 12: Team work and leadership qualities

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	2	-	25	-	-	50	3	75





PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Student Centred Activities (Internal)

Detailed Contents

This is to be organized at a stretch for two to three days during fifth or sixth semester. Extension Lectures by experts or teachers from the polytechnic will be delivered on the following broad topics.

There will be no examination for this subject.

Topic No.1: Communication Skills

Topic No.2: Correspondence and job finding/applying/thanks and follow-up

Topic No.3: Resume Writing

Topic No.4: Interview Techniques: In-Person interviews; telephonic interviews, panel interviews; group Interviews and video Conferencing etc.

Topic No.5: Presentation Techniques

Topic No.6: Group Discussions Techniques

Topic No.7: Aspects of Personality Development

Topic No.8: Motivation

Topic No.9: Leadership

Topic No.10: Stress Management

Topic No.11: Time Management

Topic No.12: Interpersonal Relationship

Topic No.13: Health and Hygiene

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	5	-	25	-	-	-	-	25



PM POLYTECHNIC

A Unit of Puran Murti Educational Society
Approved by AICTE, Ministry of HRD, Govt. of India,
Affiliated to State Board of Technical Education, Panchkula, Haryana

Subject: Industrial Training (Practical)

Subject Code: Industrial Training (P)

INDUSTRIAL TRAINING OF STUDENTS (after IV Semester examinations, During Summer vacations)

It is needless to emphasize further the importance of Industrial Training of students during their 3 years of studies at Polytechnics. It is industrial training, which provides an opportunity to students to experience the environment and culture of industrial production units and commercial activities undertaken in field organizations. It prepares student for their future role as diploma engineers in the world of work and enables them to integrate theory with practice. Polytechnics have been arranging industrial training of students of various durations to meet the above objectives.

This document includes guided and supervised industrial training of a minimum of 4 weeks duration to be organized during the semester break starting after second year i.e. after IV Semester examinations. The concerned HODs/ TPO along with other teachers will guide and help students in arranging appropriate training places relevant to their specific branch. It is suggested that a training schedule may be drawn for each student before starting of the training in consultation with the training providers. Students should also be briefed in advance about the organizational setup, product range, manufacturing process, important machines and materials used in the training organization. Equally important with the guidance is supervision of students training in the industry/organization by the teachers. A minimum of one visit per week by the teacher is recommended. Students should be encouraged to write daily report in their diary to enable them to write final report and its presentation later on.

An internal assessment of 50 and external assessment of 50 marks have been provided in the study and evaluation scheme of V Semester. Evaluation of professional industrial training report through viva-voce/presentation aims at assessing students understanding of materials, industrial process, practices in industry/field organization and their ability to engage in activities related to problem solving in industrial setup as well as understanding of application of knowledge and skills learnt in real life situations. The formative and summative evaluation may comprise of weightage to performance in testing, general behavior, quality of report and presentation during viva-voce examination. It is recommended that such evaluations may be carried out by a team comprising of concerned HOD, teachers and representative from industry.

Teachers and students are requested to see the footnote below the study and evaluation scheme of IV Semester for further details.

STUDY SCHEME			EVALUATION SCHEME						Total Marks
			Internal Assessment		External Assessment (Examination)				
Hrs/week			Theory	Practical	Written Paper		Practical		
L	T	P	Max. Marks	Max. Marks	Max. Marks	Hrs	Max. Marks	Hrs	
-	-	-	-	50	-	-	50	3	100