


<div> MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI</div> <div>TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES</div>																	
COURSE NAME : DIPLOMA IN DIGITAL ELECTRONICS																	
COURSE CODE : DE																	
DURATION OF COURSE : 6 SEMESTERS										WITH EFFECT FROM 2012-13							
SEMESTER : FOURTH										DURATION : 16 WEEKS							
FULL TIME / PART TIME : FULL TIME										SCHEME : G							
SR. NO.	SUBJECT TITLE		Abbreviation	SUB CODE	TEACHING SCHEME			EXAMINATION SCHEME									SW (17400)
								PAPER HRS.	TH (1)		PR (4)		OR (8)		TW (9)		
TH	TU	PR	Max	Min	Max	Min	Max		Min	Max	Min						
1	Environmental Studies	\$	EST	17401	01	--	02	01	50#*	20	--	--	--	--	25@	10	50
2	Industrial Measurements	β	IME	17434	03	--	02	03	100	40	--	--	--	--	25@	10	
3	Principles of Analog Communication		PAC	17439	03	--	02	03	100	40	25#	10	--	--	25@	10	
4	Microprocessor		MIC	17443	03	--	02	03	100	40	25#	10	--	--	25@	10	
5	Linear Integrated Circuits	β	LIC	17445	04	--	02	03	100	40	50#	20	--	--	25@	10	
6	Visual Basic	β	VBA	17043	01	--	02	--	--	--	--	--	--	--	25@	10	
7	Professional Practices-II	β	PPT	17044	--	--	03	--	--	--	--	--	--	--	50@	20	
TOTAL					15	--	15	--	450	--	100	--	--	--	200	--	50
**	Industrial Training (Optional)							Examination in 5 th Semester Professional Practices-III									
Student Contact Hours Per Week: 30 Hrs.																	
THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH.																	
Total Marks : 800																	
@- Internal Assessment, # - External Assessment, <div></div> No Theory Examination, \$ - Common to all branches, #* - Online Theory Examination,																	
β - Common to ET / EJ / EN / EX / IE / IS / IC / EV / MU / IU / ED / EI																	
Abbreviations: TH-Theory, TU- Tutorial, PR-Practical, OR-Oral, TW- Term Work, SW- Sessional Work.																	
** Industrial Training (Optional) - Student can undergo Industrial Training of four weeks after fourth semester examination during summer vacation.																	
Assessment will be done in Fifth semester under Professional Practices-III. They will be exempted from activities of Professional Practices-III of 5 th Semester.																	
➤ Conduct two class tests each of 25 marks for each theory subject. Sum of the total test marks of all subjects is to be converted out of 50 marks as sessional work (SW).																	
➤ Progressive evaluation is to be done by subject teacher as per the prevailing curriculum implementation and assessment norms.																	
➤ Code number for TH, PR, OR and TW are to be given as suffix 1, 4, 8, 9 respectively to the subject code.																	

Course Name : All Branches of Diploma in Engineering & Technology

**Course Code : AE/CE/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/
ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/FG/AU**

Semester : Fourth

Subject Title : Environmental Studies

Subject Code : 17401

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	01	50#*	--	--	25@	75

#* Online Theory Examination

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

Rationale:

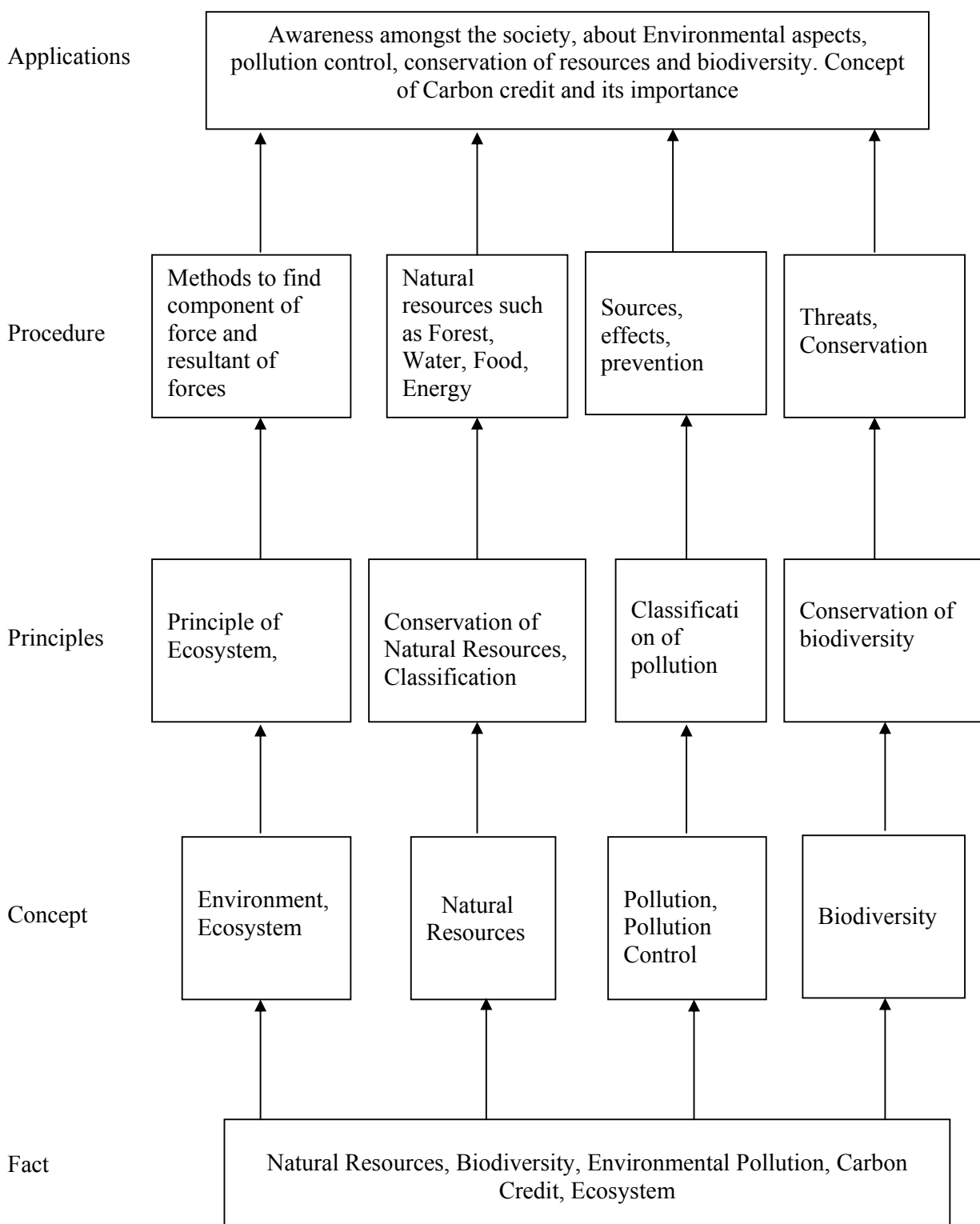
Environment essentially comprises of our living ambience, which gives us the zest and verve in all our activities. The turn of the twentieth century saw the gradual onset of its degradation by our callous deeds without any concern for the well being of our surrounding we are today facing a grave environmental crisis. The unceasing industrial growth and economic development of the last 300 years or so have resulted in huge ecological problems such as overexploitation of natural resources, degraded land, disappearing forests, endangered species, dangerous toxins, global warming etc.

It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

The curriculum covers the aspects about environment such as Environment and Ecology, Environmental impacts on human activities, Water resources and water quality, Mineral resources and mining, Forests, etc.

General Objectives: The student will be able to,

1. Understand importance of environment
2. Know key issues about environment
3. Understands the reasons for environment degradation
4. Know aspects about improvement methods
5. Know initiatives taken by the world bodies to restrict and reduce degradation

Learning Structure:

Theory:

Topic and Contents	Hours	Marks
Topic 1: Nature of Environmental Studies Specific Objectives: <ul style="list-style-type: none"> ➤ Define the terms related to Environmental Studies ➤ State importance of awareness about environment in general public Contents: <ul style="list-style-type: none"> • Definition, Scope and Importance of the environmental studies • Importance of the studies irrespective of course • Need for creating public awareness about environmental issues 	01	04
Topic 2: Natural Resources and Associated Problems Specific Objectives: <ul style="list-style-type: none"> ➤ Define natural resources and identify problems associated with them ➤ Identify uses and their overexploitation ➤ Identify alternate resources and their importance for environment Contents: <p>2.1 Renewable and Non renewable resources</p> <ul style="list-style-type: none"> • Definition • Associated problems <p>2.2 Forest Resources</p> <ul style="list-style-type: none"> • General description of forest resources • Functions and benefits of forest resources • Effects on environment due to deforestation, Timber extraction, Building of dams, waterways etc. <p>2.3 Water Resources</p> <ul style="list-style-type: none"> • Hydrosphere: Different sources of water • Use and overexploitation of surface and ground water • Effect of floods, draught, dams etc. on water resources and community <p>2.4 Mineral Resources:</p> <ul style="list-style-type: none"> • Categories of mineral resources • Basics of mining activities • Mine safety • Effect of mining on environment <p>2.5 Food Resources:</p> <ul style="list-style-type: none"> • Food for all • Effects of modern agriculture • World food problem 	04	10
Topic 3. Ecosystems <ul style="list-style-type: none"> • Concept of Ecosystem • Structure and functions of ecosystem • Energy flow in ecosystem • Major ecosystems in the world 	01	04
Topic 4. Biodiversity and Its Conservation <ul style="list-style-type: none"> • Definition of Biodiversity • Levels of biodiversity 	02	06

<ul style="list-style-type: none"> • Value of biodiversity • Threats to biodiversity • Conservation of biodiversity 		
Topic 5. Environmental Pollution <ul style="list-style-type: none"> • Definition • Air pollution: Definition, Classification, sources, effects, prevention • Water Pollution: Definition, Classification, sources, effects, prevention • Soil Pollution: Definition, sources, effects, prevention • Noise Pollution: Definition, sources, effects, prevention 	03	08
Topic 6. Social Issues and Environment <ul style="list-style-type: none"> • Concept of development, sustainable development • Water conservation, Watershed management, Rain water harvesting: Definition, Methods and Benefits • Climate Change, Global warming, Acid rain, Ozone Layer Depletion, Nuclear Accidents and Holocaust: Basic concepts and their effect on climate • Concept of Carbon Credits and its advantages 	03	10
Topic 7. Environmental Protection Brief description of the following acts and their provisions: <ul style="list-style-type: none"> • Environmental Protection Act • Air (Prevention and Control of Pollution) Act • Water (Prevention and Control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act Population Growth: Aspects, importance and effect on environment <ul style="list-style-type: none"> • Human Health and Human Rights 	02	08
Total	16	50

Practical:**Skills to be developed:****Intellectual Skills:**

1. Collection of information, data
2. Analysis of data
3. Report writing

Motor Skills:

1. Presentation Skills
2. Use of multi media

List of Projects:

Note: Any one project of the following:

1. Visit to a local area to document environmental assets such as river / forest / grassland / hill / mountain
2. Visit to a local polluted site: Urban/Rural/Industrial/Agricultural
3. Study of common plants, insects, birds

4. Study of simple ecosystems of ponds, river, hill slopes etc

Prepare a project report on the findings of the visit illustrating environment related facts, analysis and conclusion. Also suggest remedies to improve environment.

Learning Resources:

Books:

Sr. No.	Author	Title	Publisher
01	Anindita Basak	Environmental Studies	Pearson Education
02	R. Rajgopalan	Environmental Studies from Crises to Cure	Oxford University Press
03	Dr. R. J. Ranjit Daniels, Dr. Jagdish Krishnaswamy	Environmental Studies	Wiley India

Course Name : Electronics Engineering Group
Course Code : ET/EN/EX/EJ/IE/IS/IC/DE/EV/MU/IU/ED/EI
Semester : Fourth
Subject Title : Industrial Measurements
Subject Code : 17434

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	--	--	25@	125

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

Rationale:

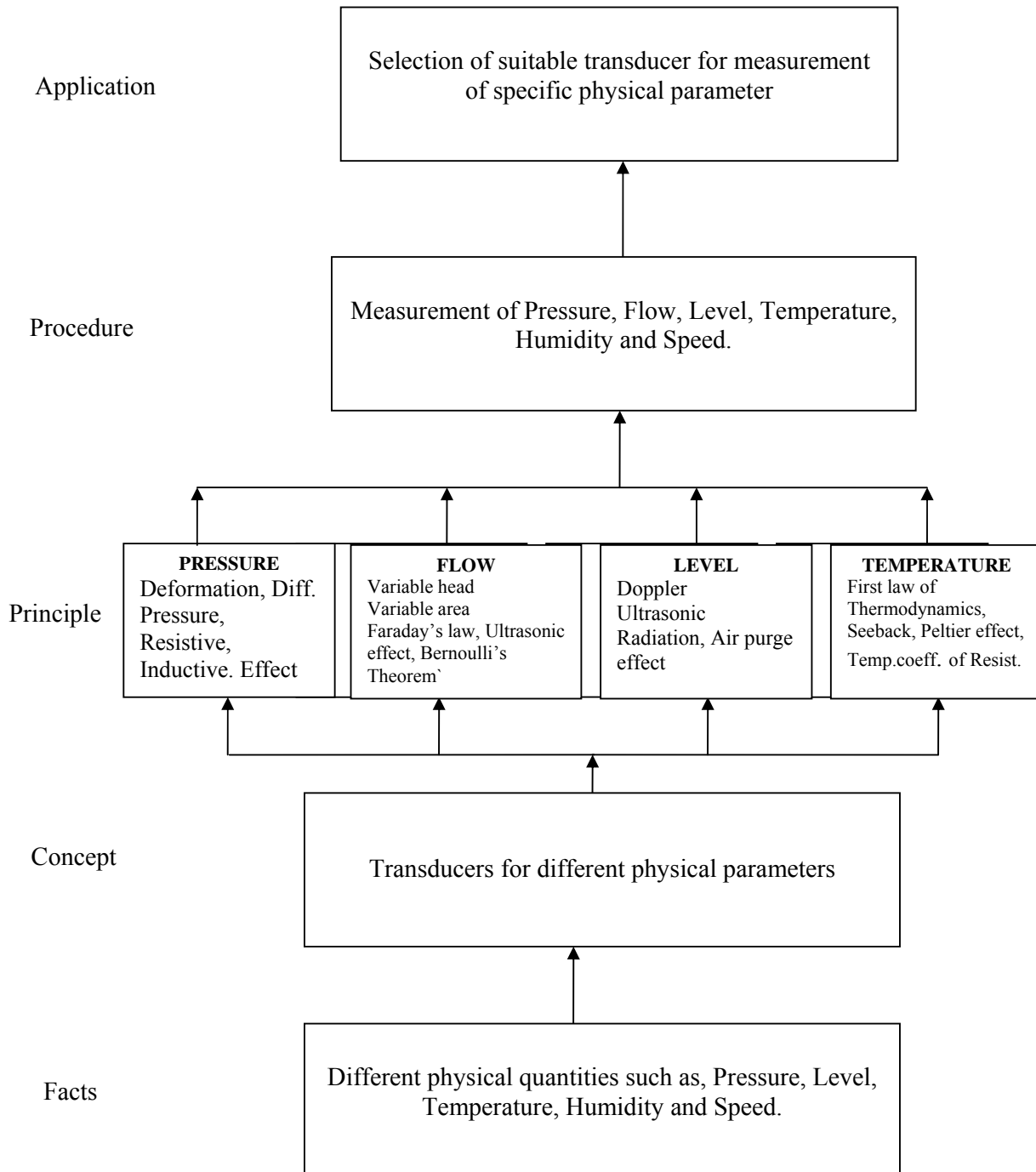
The science of instrumentation system plays vital role in the development of technology. An electronic system has prime importance in the field of instrumentation. Most of the physical parameters can be converted into electrical signal with the use of transducers. The obtained electrical signal can be conditioned, processed, displayed and controlled with the use of advanced control system.

With the background of measuring instruments, this subject deals with measurement of different physical parameters like temperature, pressure etc. covering the entire gamut of industrial measurement. Different types of transducers used for measurement of different physical quantities with their construction, working principle, advantages, and disadvantages are studied through this subject.

General Objectives:

After studying this subject the students will be able to:

- 1) Understand the nature and working of instrumentation system used in industrial & general applications.
- 2) Classify the physical parameters with their proper units
- 3) Understand the concepts of different types of transducers

Learning Structure:

Theory Contents:

Topic No	Theory	Hrs.	Marks
1	<p>Transducers: Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Draw and describe the block diagram of Instrumentation system. ➤ Compare different Transducers ➤ Draw and describe different Electronic Transducers. <p>Contents</p> <ul style="list-style-type: none"> • Instrumentation System: Block diagram of Instrumentation system: Function of each block, Explanation of basic instrumentation systems • Transducer: Need of Transducer: Classification of transducers: Active and Passive, Analog and Digital, Primary and Secondary. • Electrical Transducers: Resistive transducers- Linear & Angular potentiometers Capacitive transducer Inductive transducer –LVDT, RVDT (As a displacement transducer) Piezoelectric transducer (Principle of operation and applications of above) • Selection criterion of transducers 	08	16
2	<p>Pressure measurement</p> <ul style="list-style-type: none"> ➤ Draw and describe the non-elastic and elastic pressure transducers. ➤ Draw and describe electronic pressure transducers. ➤ Write procedure of calibration of elastic pressure gauges using dead weight tester. <p>Contents</p> <ul style="list-style-type: none"> • Pressure: Definition Types - Absolute, Gauge, Atmospheric, Vacuum(Definition, Units) • Classification of Pressure measuring devices • Non elastic pressure transducer: U tube Inclined Tube Well type manometer • Elastic pressure transducer: Bourdon Tube Bellows Diaphragm Capsule • Electronic pressure transducers: Bourdon tube with LVDT Diaphragm with Strain gauge 	08	20

	<ul style="list-style-type: none"> Calibration of pressure gauge using dead weight tester <p>Note: Each transducer should be studied on the basis of working principle, construction, advantages, disadvantages and applications.</p>		
3	<p>Flow Measurement</p> <ul style="list-style-type: none"> ➤ List of different types of flow. ➤ List of different types of flow measuring transducers. ➤ Draw and describe construction and working of different Flow measuring transducers. <p>Contents</p> <ul style="list-style-type: none"> Flow: <ul style="list-style-type: none"> Definition Types of Flow –Laminar, turbulent , Reynolds number Classification of flow measuring transducers : <ul style="list-style-type: none"> Variable head flow meter- Venturimeter, orifice plate meter Variable area flow meter – Rota meter Electromagnetic Flow meter Ultrasonic flow meter- Time difference and Doppler Type <p>Note: Each transducer should be studied on the basis of working principle, construction, advantages, disadvantages and applications.</p>	06	14
4	<p>Level Measurement</p> <ul style="list-style-type: none"> ➤ State the need of level measurement. ➤ List of different level measuring methods. ➤ Draw the construction and describe working of Level measuring transducers. <p>Contents</p> <ul style="list-style-type: none"> Level: <ul style="list-style-type: none"> Definition Need of level measurement Classification of level measurement methods: <ul style="list-style-type: none"> Float type – linear & rotary potentiometer (Contact type) Capacitive type (Contact type) Ultrasonic type (Non-contact type) Radiation type (Non-contact type) RADAR type (Non-contact type) <p>Note: Each transducer should be studied on the basis of working principle, construction, advantages, disadvantages and applications.</p>	08	16
5	<p>Temperature measurement</p> <ul style="list-style-type: none"> ➤ List different temperature measuring scales and its conversions. ➤ List different temperature measuring transducers. ➤ Draw the construction and describe working of different temperature transducers. <p>Contents</p> <ul style="list-style-type: none"> Temperature : <ul style="list-style-type: none"> Definition and units First law of thermodynamics Different temperature scales & their conversions Classification of temperature measuring transducers: 	10	20

	<p>Filled system type thermometer. Bimetallic thermometer Thermistors RTD - (PT-100) , 2 /3/4 wire systems (circuit diagram only) Thermocouple - Seebeck & Peltier effect , Types J, K, R , S, T etc. (Based on material, temperature ranges) Pyrometer - Optical, Radiation</p> <p>Note: Each transducer should be studied on the basis of working principle, construction, advantages, disadvantages and applications.</p>		
6	<p>Special Transducers and Measurements</p> <ul style="list-style-type: none"> ➤ List different types of humidity and its units. ➤ Draw the construction and describe working of Humidity transducers. ➤ Draw the construction and describe working of Speed measuring transducers. <p>Contents</p> <ul style="list-style-type: none"> • Humidity: Definition Types - Absolute, relative • Humidity measurement devices: Psychrometer - Dry & wet Bulb thermometer type Hygrometer- hair type , capacitive , resistive type • Speed Definition Classification of speed measurement methods Photoelectric pick-up (Non contact type) Magnetic pick-up (Non contact type) • pH Measurement <p>Note: Each transducer should be studied on the basis of working principle, construction, advantages, disadvantages and applications.</p>	08	14
Total		48	100

Practical:**Skills to be developed:****Intellectual Skills:**

- Selection of transducer based on application.
- Interpretation of results.

Motor Skills:

- Connection of different transducers with measuring system.
- Measurement of various physical parameters using transducers.
- Observation and plotting the characteristics.

List of Practicals:

Sr. No.	Title of the Experiment
1	Measure displacement using LVDT
2	Measure weight using strain gauge pressure transducer with cantilever setup

3	Measure pressure using Bourdon tube pressure gauge
4	Calibrate pressure gauge using Dead weight pressure gauge tester
5	Determine the rate of flow of liquid in pipe using Rotameter
6	Calculate flow through pipe using orifice meter
7	Measure temperature of liquid using Resistance Temperature Detector (PT 100)
8	Measure temperature of liquid using thermocouple
9	Observe and interpret humidity of air using wet and dry bulb Hygrometer
10	Measure speed of motor using non contact type photo electric tachometer.

Learning Resources:**1. Books:**

Sr. No.	Author	Title	Publisher
01	A.K.Sawhney	Electrical and Electronic Measurements and Instrumentation	Dhanpat Rai & Sons.
02	S.K.Singh	Industrial Instrumentation & Control	Tata McGraw Hill Publishing Co. Ltd; N. Delhi
03	D. Patranabis	Principles of Industrial Instrumentation	Tata McGraw Hill Publishing Co. Ltd; N. Delhi
04	Rangan Mani Sharma	Instrumentation Systems and Devices	Tata McGraw Hill Publishing Co. Ltd; N. Delhi
05	Bela Liptak Kriszta Venczel	Process Measurement Instrument Engineers Handbook	Chilton Book Co.
06	B.C.Nakra K.K.Chaudhry	Instrumentation Measurement and Analysis	Tata McGraw Hill Publishing Co. Ltd; N. Delhi.

2. CD/ PPTs etc.:

- www.proprofs.com/webschool
- www.osvn.com

3. Websites

- <http://en.wikipedia.org/wiki/>
- www.youtube.com/ “here type name of instrument”
- www.controlnet.com

Course Name : Diploma in Digital Electronics
Course Code : DE
Semester : Fourth
Subject Title : Principles of Analog Communication
Subject Code : 17439

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	25#	--	25@	150

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

Rationale:

Electronic Communication plays vital role in day to day activities. Development of communication Technology has increased its application in allied field of electronics including telephony, telegraphy, satellite , Mobile, RADAR, industrial controls, online application like internet banking, ATM machine, Wireless network, optical communication, Mobile communication system.

Analog communication is a foundation for all advanced subjects in communication engineering.

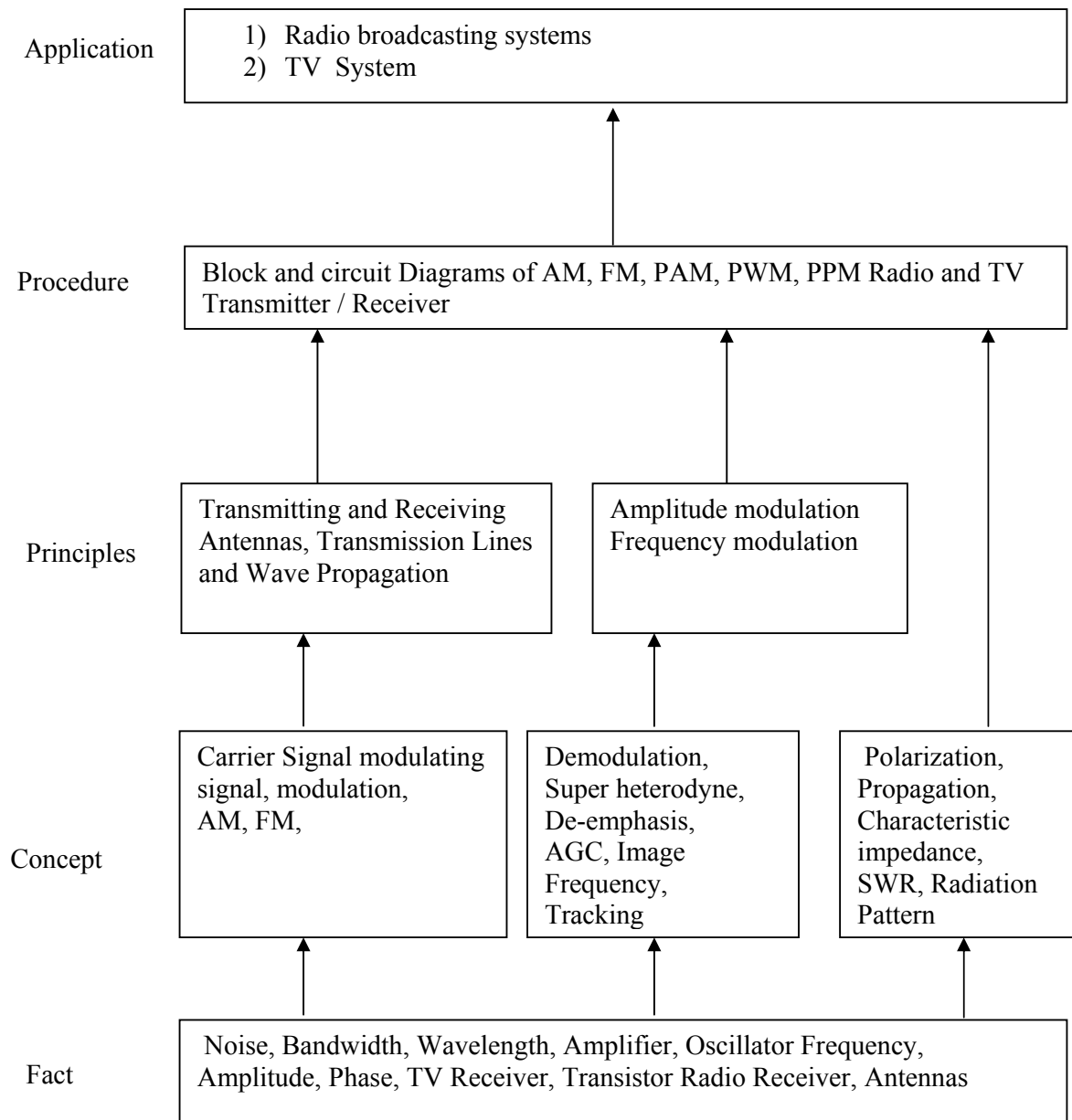
This subject will focus on the operation of analog transmission and reception techniques. This subject also deals with pulse modulation and their different types.

Study of Elements of Electronics, Electronic Devices and Circuits is prerequisite for Analog communication subject.

General Objectives:

The student will able to

1. Know different electronic communication systems.
2. Understand concept of modulation and demodulation of AM / FM.
3. Understand the operation of AM/ FM transmitter and receiver.
4. Understand the operation of TV transmission and receptions.

Learning Structure:

Theory Contents:

Topic No	Theory	Hrs.	Marks
1	Electronic Communication and Modulation Techniques Specific Objectives: <ul style="list-style-type: none"> ➤ Able to draw block diagram of electronic communication system ➤ Identify types of electronic communication systems. ➤ Describe different types of modulation. Contents: <p>1.1 Basics of electronic communication [04]</p> <ul style="list-style-type: none"> • The importance of electronic communication. • Definition: Analog, Digital and Baseband signal • Elements of basic electronic communication system (Draw block diagram and explain each block.) • Concept of transmission bandwidth. • Noise and types of noise <p>1.2 Basics of Modulation [08]</p> <ul style="list-style-type: none"> • Need for modulation • Types: AM, FM, PM: Definition <p>1.3 Amplitude Modulation</p> <ul style="list-style-type: none"> • Modulation index-definition, its effect on modulated signal • Mathematical equation of amplitude modulated wave & its meaning, concepts of side band (SSB,DSB), vestigial sideband (VSB) • Bandwidth requirement • Representation of AM signal in time & frequency domain • Power relations in AM wave, simple numerical • Circuit diagram and working of BJT/FET modulator. <p>1.4 Frequency modulation [08]</p> <ul style="list-style-type: none"> • Deviation ratio, maximum deviation ratio, mathematical representation of FM & its meaning • Representation of FM signal in time domain & frequency domain • Bandwidth requirements • Concept of Pre-emphasis & De-emphasis • Generation of FM -Reactance modulator, varactor diode modulator, Armstrong method • FM signal generation using ICs 566,564 <p>1.5 Pulse Modulation Techniques [04]</p> <ul style="list-style-type: none"> • Need of Pulse Modulation • PAM, PWM, PPM- Block diagram, waveforms, advantages & disadvantages & their comparison. • Generation of PAM transistorized circuit, Generation of PWM, PPM using IC 555. 	12	24
2	Wave Propagation Specific Objectives: <ul style="list-style-type: none"> ➤ Understand theory of electromagnetic radiation. ➤ State different types of wave propagation. ➤ Define the various atmospheric layers ➤ Define the terms maximum usable frequency, critical 	06	10

	<p>frequency, skip distance & fading.</p> <p>Contents:</p> <ul style="list-style-type: none"> • Fundamental of electromagnetic waves, Transverse electromagnetic wave, • Types of Wave Propagation • Ground Wave. • Sky wave, ionosphere & its effect. • Space Wave, Duct propagation • Troposphere scatter propagation • Concept of actual height & virtual weight • Critical frequency, skip distance & fading, maximum usable frequency. 		
3	<p>Antennae</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Define antenna. ➤ Understand the term related with the antenna. ➤ Understand the structure, radiation pattern & application of different antennae. <p>Contents:</p> <p>3.1 Antenna fundamentals : [04]</p> <ul style="list-style-type: none"> • Resonant antenna and Non-resonant antennas • Definition : Radiation pattern ,polarization, bandwidth, beam width, antenna resistance, directivity & power gain, antenna gain <p>3.2 Dipole antenna [04]</p> <ul style="list-style-type: none"> • Half wave dipole antenna (Resonant Antenna) & its Radiation pattern. • Folded dipole antenna & its radiation pattern. • Radiation pattern for Dipole Antenna of different length. <p>3.3 Structure, radiation pattern & application of antennas. [04]</p> <ul style="list-style-type: none"> • Loop antenna. • Yagi-Uda antenna • Micro wave antenna – Dish antenna & Horn antenna • Microstrip antennas- Rectangular, circular and square 	06	12
4	<p>Radio Receiver</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ State super heterodyne principle ➤ Compare TRF & super heterodyne receivers. <p>Contents:</p> <p>4.1. AM Receiver : [12]</p> <ul style="list-style-type: none"> • Block diagram of Tuned Radio Frequency receiver and its working with waveforms. • Block diagram of super heterodyne receiver • RF Section and Characteristics of AM radio receiver sensitivity, selectivity, fidelity. • Image frequency and its rejection • Frequency changing and tracking. • Demodulation of AM signal. • Diode detector, practical diode detector. • Need of AGC & its types – simple, delayed. 	08	20

	4.2 FM receiver : [08] <ul style="list-style-type: none"> Block diagram and explanation of FM Super heterodyne radio receiver Circuit diagram and working of slope detector and Balanced slope detector PLL as FM demodulator. 		
5	TV Fundamentals Specific Objectives: <ul style="list-style-type: none"> ➤ Define various terms used in TV system ➤ Explain Tri-colour theory and Grassman's Law ➤ Draw and understand composite video signal wave-forms ➤ State CCIR-B standards for TV system 5.1 [10] <ul style="list-style-type: none"> Concept: Aspect ratio, image continuity, interlace scanning, scanning periods – horizontal and vertical, vertical resolution, horizontal resolution. Vestigial sideband transmission, bandwidth for Colour signal, brightness, contrast, viewing distance, luminance, Hue, saturation, compatibility. Colour theory, primary colours and secondary colours Grassman's law, additive Colour mixing subtractive Colour mixing. 5.2 [08] <ul style="list-style-type: none"> Composite Video Signal - Pedestal height, Blanking pulse, Colour burst, Horizontal sync pulse details, Vertical sync pulse details, Equalizing pulses, CCIR B standards for Colour signal transmission & reception. 	08	18
6	TV Transmitter and Receiver Specific Objectives: <ul style="list-style-type: none"> ➤ Describe TV camera tube and colour picture tube ➤ Explain the function of Color TV transmitter and receiver. Contents: 6.1 [08] <ul style="list-style-type: none"> Introduction to TV camera tube, principle and working of Vidicon Plumbicon Solid State camera based on CCD. Color Picture tube, principle and working of PIL 6.2 [08] <ul style="list-style-type: none"> Block diagram of Colour TV transmitter. Block Diagram and operation of color TV receiver (PAL D, NTSC, and SECAM type) Block diagram of MATV, CATV, HDTV and CCTV and their applications 	08	16
Total		48	100

Practical:**Intellectual Skills:**

1. Interpret the results of output waveforms

Motor Skills:

1. Testing and observing the waveforms at various stages
2. Fault finding

List of Practical's

1. Observe and draw the waveform of AM & calculate modulation index of AM
2. Observe and draw the waveform of FM & calculate modulation index of FM
3. Observe and draw the waveforms of FM modulator using IC 566.
4. Observe the wave forms at various points in AM receiver. Trouble shooting and fault finding in AM receiver.
5. Observe & Plot the graph of RF Characteristics of Radio Receiver: Selectivity, Sensitivity, Fidelity.
6. Generate PAM and observe the waveforms of PAM
7. Generate PWM, PPM and observe the waveforms of PWM, PPM using IC's.
8. Plot the radiation pattern of Dipole & Yagi-Uda antenna.
9. Plot the radiation pattern of basic microstrip patch antenna.
10. Trace: a) chroma section, b) picture tube, c) video amplifier of TV receiver
11. Voltage analysis of: a) chroma section, b) picture tube c) Video amplifier,
12. Voltage analysis of:
 - a) Vertical Section b) Horizontal Section c) Power supply of TV receiver.

Learning Resources:**Books:**

Sr. No.	Author	Title	Publisher
01	George Kennedy, Bernard Davis, SRM Prasanna	Electronic Communication Systems	TATA Mc-Graw Hill 5 th Edition
02	Louis E Frenzel	Communication Electronics	TATA Mc-Graw Hill 5 th Edition
03	V Chandra Sekar	Analog Communication	Oxford University Press
04	Television & Radio Engineering	A.M Dhake	Tata McGraw-Hill
05	Modern TV Practice (4 th edition)	R.R Gulati	New Age International

Web Sites:

1. en.wikipedia.org
2. www.masd.k12.pa.us (Electromagnetic Spectrum)

3. www.staff.ncl.ac.uk (modulation & demodulation)
4. circuitdiagram.net/am-radio-receiver.html (AM radio receiver circuit diagram)
5. <http://www.circuitdiagram.org/am-radio-receiver-with-mk484.html>
6. www.circuitstoday.com/single-chip-fm-radio-circuit

List of equipments

1. CRO, Function generator, spectrum analyzer, DMM
2. AM,FM,PAM,PWM,PPM Modulation/ Demodulation trainer kits
3. Transmission line trainer kit/ Coaxial cable e.g. (RG174)—100mtrs.
4. Antenna demonstration kit/ Antenna for measuring its parameters
5. Radio and Television receiver trainer kits

Course Name : Diploma in Digital Electronics**Course Code : DE****Semester : Fourth****Subject Title : Microprocessor****Subject Code : 17443****Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
03	--	02	03	100	25#	--	25@	150

NOTE:

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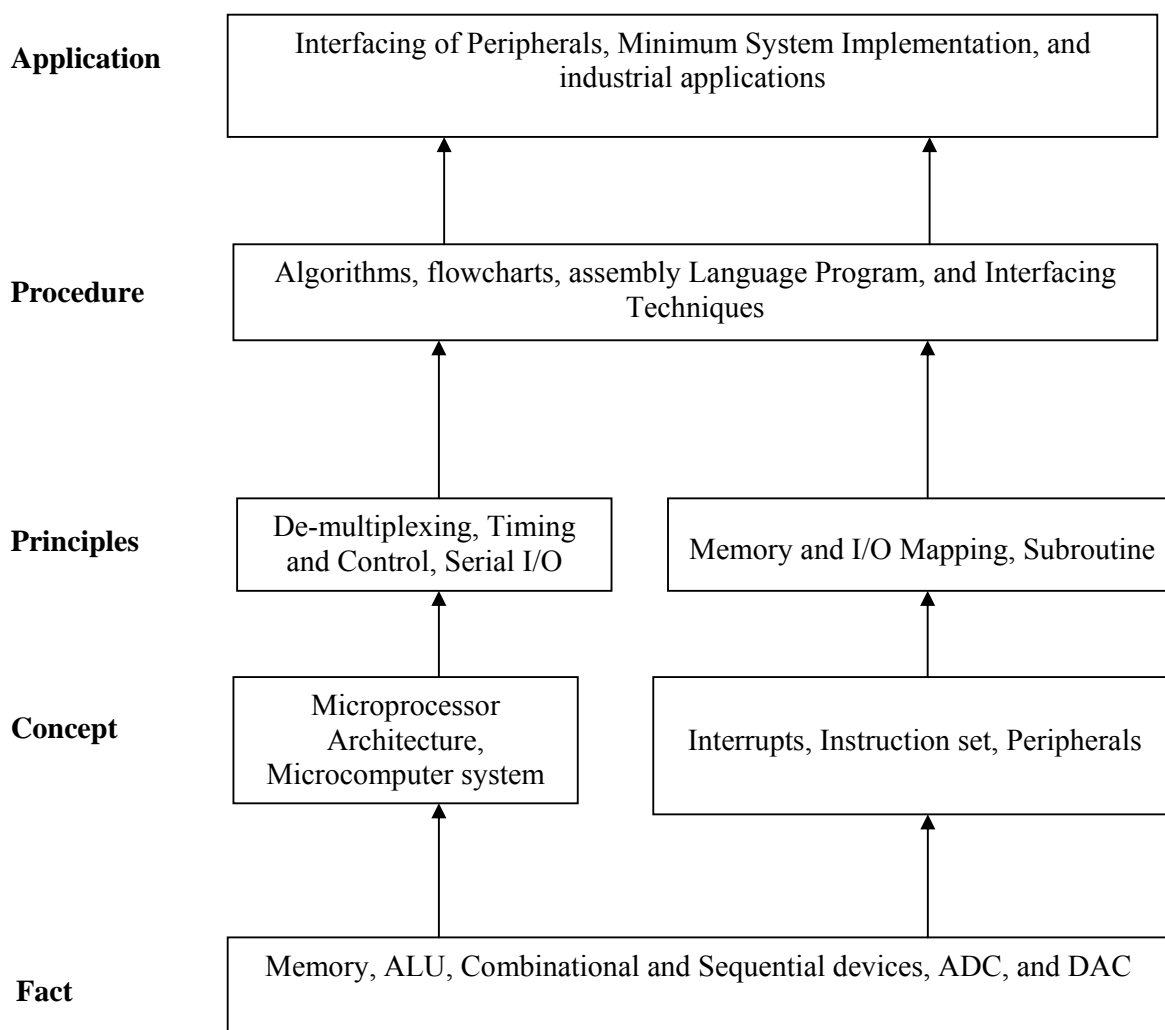
Rationale:

Microprocessor plays important role in computer based application and is heart of the system. The Microprocessors along with memory and I/O's constitute a complete system for industrial application. Since most of the peripherals are 8 bit in nature and hence the 8 bit processor 8085 is introduced in microprocessor curriculum. It covers comprehensive study of architecture, programming and interfacing.

Microprocessor and its programming require the background information of principles of digital electronics. By completing this module student can write high level language program for peripheral controlling mechanism in embedded system.

General Objectives:**The student will be able to**

- Understand the architecture of 8-bit microprocessor.
- Learn instruction set and programming.
- Learn to interpret peripherals and its interfacing.
- Implement minimum system design.

Learning Structure:

Theory:

Topic No	Contents	Hours	Marks
1	8 Bit Microprocessor - 8085 Specific Objectives: <ul style="list-style-type: none"> ➤ Comprehend Components and terminology of computer system and microprocessor based system ➤ Describe Architecture of 8 bit processor Contents: <ul style="list-style-type: none"> • Introduction to 8 bit microprocessor and Microcomputer, system buses • Salient features of 8085 • 8085 microprocessor architecture-Register section, ALU, Interrupt control, Serial I/O control, Timing and control and pin description • De-multiplexing of low order Address/Data bus, and generation of control signals 	08	16
2	8085 Instructions and Programming <ul style="list-style-type: none"> ➤ Develop assembly language program. Contents: <ul style="list-style-type: none"> • Instruction format, Addressing modes, 8085 Instruction Set • Machine Cycle and Timing diagram • Assembly language programming 	12	24
3	Subroutine and Interrupts <ul style="list-style-type: none"> ➤ Comprehend stack, subroutine and interrupts Contents : <ul style="list-style-type: none"> • Stack and subroutine, time delay subroutine • Interrupts- Necessity of interrupts, interrupt handling, Types of interrupts, Vector Interrupt locations, Interrupt control instructions (EI, DI RIM and SIM), Priority of interrupts, Polling of interrupts, Pending interrupts 	08	12
4	Memory and I/O Interfacing <ul style="list-style-type: none"> ➤ Interface various memory chips with 8085 Contents: <ul style="list-style-type: none"> • Memory interfacing: RAM/ ROM Memory map. • I/O Interfacing Techniques- I/O mapped I/O, memory mapped I/O • Serial I/O lines – SOD and SID • Comparison of I/O mapped I/O and memory mapped I/O. 	08	16
5	Programmable Peripheral Devices <ul style="list-style-type: none"> ➤ Draw and describe peripheral programmable devices and interfaces Contents: <ul style="list-style-type: none"> • Programmable Peripheral Interface IC 8255-Block diagram, Pin Description, operating modes, simple I/O programs 	08	20

	<ul style="list-style-type: none"> • Programmable I/O ports and Timer IC 8155-Block diagram, Pin Description, operating modes of timer and I/O ports, simple programs on timer operations only • Features of 8355, Block Diagram and Pin Description • Comparison of features of 8155 and 8255 and 8355 ICs 		
6	<p>Data transfer Techniques and Interfacing the Peripherals</p> <ul style="list-style-type: none"> ➤ Classify data transfer techniques. ➤ Implement minimum system <p>Contents:</p> <ul style="list-style-type: none"> • Types of data transfer techniques • DMA controlled data transfer. • Interfacing of Peripherals 8255, 8155, 8355 • Interrring of LED, Seven Segment Display, DIP Switches, ADC, DAC, Stepper Motor using PPI. • Minimum system based on 8085, 8155, and 8355 	04	12
Total		48	100

Practical:**Intellectual Skills:**

- Select peripheral and interface to provide the solution for minimum system.
- Develop algorithm, flowchart, Assembly language program and execution

Motor Skills:

- Load and execute the program in user memory of microprocessor kit.
- Observe the result in specific memory location and registers.
- Develop logic for practical applications of microprocessor.

List of Practicals:

- 1) Assembly language programs for addition and subtraction of 8 bit /16 bit numbers.
- 2) Assembly language program for block transfer.
- 3) Assembly language program to multiply two 8 bit numbers using add and shift techniques.
- 4) Find one's and two's complement of a given number and exchange the lower and upper nibble of a byte.
- 5) Sort odd and even bytes from given 10 bytes and Find Largest and smallest numbers from given block.
- 6) Arrange given block in Ascending and descending order
- 7) Assembly language program to transmit / receive 8 bit serial data using SID and SID lines.
- 8) Interface simple switches and LEDs using 8255 and develop water level controller using 8085.
- 9) Generation of square wave using 8155 timer
- 10) Assembly language program to interface ADC/DAC with 8085.

Learning Resources:**1. Books:**

Sr. No.	Author	Title	Publisher
1	Ramesh S. Gaonkar	Microprocessor Architecture, Programming and Applications with 8085	Penram International
2	B.Ram	Fundamentals of Microprocessors and Microcomputers	Danpat Rai publications
3	Aditya P. Mathur	Introduction to Microprocessor	Tata Mcgraw Hill
4	Shridhar Ghosh	0000 to 8085	--

2. CDs, PPTs etc:

<http://www.slideshare.net/saumitra5552001/8085-paper-presentation-presentation>
<http://yesnarayanan.blogspot.com/2008/07/8085-ppt.html>
<http://yesnarayanan.blogspot.com/2008/12/8085-microprocessor-tutorials.html>
http://www.authorstream.com/Presentation/vishesh_0802-236980-8085-entertainment-ppt-powerpoint/

3. Websites:

- 1) www.8085projects.info
- 2) www.topsite.com/best/8085
- 3) www.enow.com

Course Name : Electronics Engineering Group
Course Code : ET/EN/EX/EJ/IE/IS/IC/DE/EV/MU/IU/ED/EI
Semester : Fourth
Subject Title : Linear Integrated Circuits
Subject Code : 17445

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	--	02	03	100	50#	--	25@	175

NOTE:

- Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.
- Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work (SW).

Rationale:

Modern age technology has developed on high density and high speed electronics circuits. Integrated circuits are basis of these high density circuits enabled to reduce size, weight and cost of equipments. They have intrinsic features such as low power consumption, low noise and ease of design.

Today the growth of any industry depends upon electronics to great extent. Contents of this subject are the basic building blocks of different analog circuits.

Basic operating and designing principle of such a large collection of circuits establishes a foundation for understanding new development in the electronics field, instrumentation and power control. This subject acquaints student with general analog principles and design methodologies using integrated circuit for system design.

Prerequisites various devices and circuits studied in elements of electronics and electronic devices and circuits. Prospects- LSI, MSI, VLSI.

General Objectives:

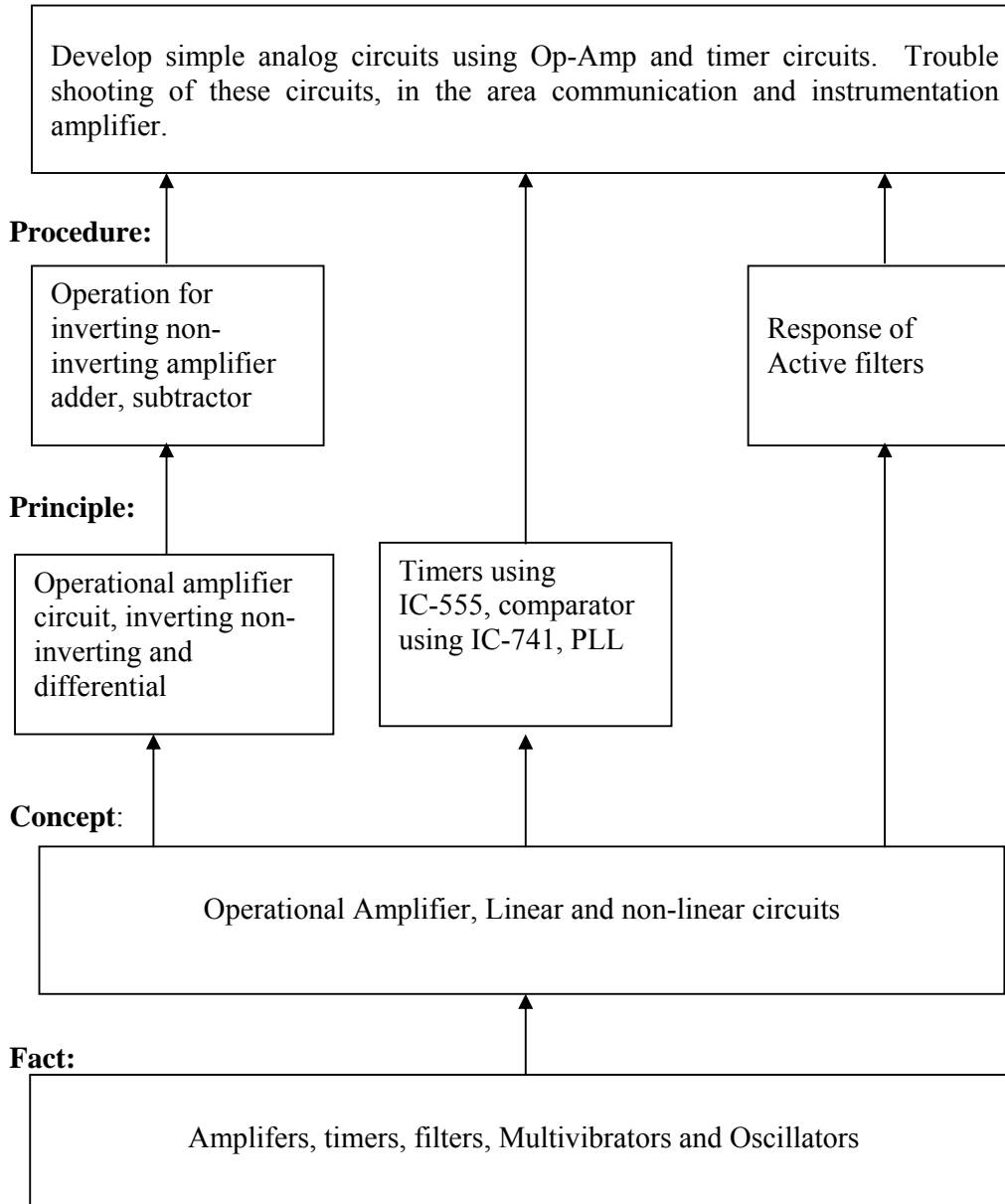
Students will be able to:

- Understand working principle of Op-Amp and IC555
- Develop electronics circuits using timer IC555 and Op-Amp

- Analyze the response of frequency selective circuits such as PLL with respect to the incoming signal.

Learning Structure:

Application:



Contents: Theory

Topic	Content	Hours	Marks
1	Operational Amplifier (Op-Amp): Specific Objectives : <ul style="list-style-type: none"> ➤ Draw labeled block diagram of Op-Amp ➤ Specify and define Different parameters of Op-Amp ➤ Interpret ideal transfer characteristics of Op-Amp Contents: <ul style="list-style-type: none"> • Importance of Op-Amp: Block diagram of Op-Amp and function of each block with the circuit such as balanced, Unbalanced, differential amplifiers with simple current source, level shifter and complementary push-pull amplifier. Equivalent Circuit, Circuit Symbols And Terminals. Op-Amp IC-741 pin diagram and function. • Parameters of Op-Amp: Input offset voltage, Input offset current, Input bias current, differential input resistance, Input capacitance, Input voltage range, offset voltage adjustment range, Common Mode Rejection Ratio (CMRR), Supply Voltage Rejection Ratio (SVRR), large signal voltage gain and transfer characteristics, supply voltages, supply current, output voltage swing, output resistance, slew rate, gain bandwidth product, output short circuit current. 	12	10
2	Op-Amp Configuration: Specific Objectives: Students will be able to <ul style="list-style-type: none"> ➤ Differentiate open and close loop configuration. ➤ Identify inverting and non-inverting configuration. ➤ Construct integrator and differentiator. 2.1 Open loop and closed loop configuration of Op-Amp, [08] its comparison. Virtual ground, virtual short concept. Open loop configuration – Inverting , Non-inverting Close loop configuration – Inverting, non- inverting, differential amplifier, unity gain amplifier (voltage follower), inverter(sign changer) 2.2 Inverting and non-inverting configuration of [10] Adders (summing amplifier, scaling Amplifier, averaging amplifier) Subtractor. Basic Integrator Basic Differentiator Basic concept of frequency compensation of Op-Amp and Offset nulling. Numerical based on designing of above circuit.	12	18
3	Applications of Op-Amp: Specific Objectives: <ul style="list-style-type: none"> ➤ Compute component values for instrumentation amplifier. ➤ Explain IC LM-324 ➤ Explain different applications of Op-Amp. 3.1 Need for signal conditioning and signal processing. [08]	12	22

	<p>Circuit diagram, operation, derivation of output voltage Equation. advantages and applications of Instrumentation amplifier.</p> <p>Pin diagram pin functions and specifications of IC LM 324</p> <p>Voltage to current converter (with floating load, with grounded load) Current to voltage converter.</p> <p>3.2 Sample and hold circuit. [16]</p> <p>Logarithmic and antilogarithmic amplifiers (using Diodes)</p> <p>Analog divider and analog multiplier</p> <p>Comparator: Circuit diagrams and operation of</p> <ul style="list-style-type: none"> • Zero crossing detector, • Schmitt trigger, • Window detector, • Phase detector, • Active peak detector, • Peak to peak detector 		
4	<p>Filters:</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Distinguish the types of filter ➤ Explain active and passive filter ➤ Explain different parameters of filter. <p>Contents:</p> <ul style="list-style-type: none"> • Introduction to filters ,Classification of filters, • Concept of passive and active filters • Merits and demerits of active filters over passive filters • Ideal and actual characteristics, terms: - cut off frequency, Pass band, Stop band, center frequency, roll off rate, BW, Q-factor, first order and second order Butterworth filters, order of filter, Low pass filter, high pass filter, band pass filter (wide band pass , narrow band pass filter) Band reject filter(wide band reject, narrow band reject filter), all pass filter. Numerical based on design of different filters. 	10	16
5	<p>Timers</p> <p>Specific Objectives:</p> <ul style="list-style-type: none"> ➤ Draw block diagram of IC 555 ➤ Understand industrial applications of IC 555 ,565 <p>5.1 Introduction to timer IC 555 [10]</p> <ul style="list-style-type: none"> • Block diagram of IC 555 and its pin diagram and function of each pin. • Concepts of different timer circuits used in industries: water level controller, Touch plate switch, frequency divider. • Numericals based on timers. <p>5.2 Phase Lock Loop</p> <ul style="list-style-type: none"> • Principle of operation, block diagram of PLL. [08] • Applications of PLL as multiplier, FM demodulator. • Pin diagram and pin functions of IC 565(PLL) 	10	18

6	Oscillators: Specific Objectives: <ul style="list-style-type: none"> ➤ Explain concept of oscillators ➤ Explain different types of oscillators ➤ Develop multivibrators and oscillators for given values. Contents: <ul style="list-style-type: none"> • Concept of oscillators, • Types of oscillators: Phase shift oscillators, Wien bridge oscillators using IC-741 • Types of Multivibrators: Monostable, Astable, Bistable using IC-555 and IC-741. Schmitt trigger, voltage controlled oscillator (VCO) using IC-555. 	08	16
Total		64	100

Practical:**Intellectual Skills:**

1. Interpret the waveforms.
2. Find faults in circuits.

Motor Skill:

1. Testing and Measurement.

List of Practicals:

Sr. No.	Title of the Experiment
01	Determine the op-amp parameters: <ul style="list-style-type: none"> • Input Offset Voltage (V_{io}) • Output Offset Voltage (V_{oo}) • Common mode rejection ratio (CMRR)
02	Determine the gain of Inverting and Non-inverting amplifier using op-amp and compare it with theoretical gain.
03	Verify the operation of Adder and Subtractor circuit using op-amp IC 741.
04	Verify the working of active integrator and differentiator circuits using op-amp IC 741 for following inputs: <ul style="list-style-type: none"> • Sine waveform • Square waveform • Rectangular waveform
05	Assemble V to I converter and I to V converter using IC 741 and measure the respective output.
06	Verify the working of following comparator circuits using op-amp IC 741 and draw the input-output waveforms <ul style="list-style-type: none"> • Zero crossing detector • Active peak detector
07	Assemble first order low pass Butterworth filter using op-amp and plot the frequency response and determine its cutoff frequency.
08	Assemble Astable multivibrator circuit using IC 741. Plot the output waveform and determine the frequency of oscillations and duty cycle.
09	Assemble Monostable multivibrator circuit using IC 555. Plot the output waveform and determine the on-time.
10	Assemble Schmitt trigger circuit using IC 555. Plot the output waveform and

	determine UTP and LTP
11	Assemble Instrumentation amplifier circuit using IC 324 and determine the overall gain.
12	Verify the operation of frequency Multiplier using PLL IC 565 and determine the output frequency.

Learning Resources:**Books:**

Sr. No.	Author	Title	Publisher
01	K.R. Botkar	Integrated Circuit	Khanna
02	Ramakant Gayakwad	Op-Amps and Linear Integrated Circuit	PHI
03	Serigo Franco	Design with Operational Amplifier and Analog Integrated Circuit	Tata-McGraw Hill
04	Willam D. Stanley	Operation Amplifier with Linear Integrated Circuit	Person

Course Name : Electronics Engineering and Video Engineering Group**Course Code : ET/EJ/IE/IS/EN/EX/IC/MU/EV/DE/TU/ED/EI****Semester : Fourth****Subject Title : Visual Basic****Subject Code : 17043****Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
01	--	02	--	--	--	--	25@	25

Rationale:

Today's most of the electronically operated devices, integrated circuits, controllers, equipments, gadgets are run by specific drivers/software. To understand design, develop and write drivers programming knowledge is required. To run the devices software has to be user friendly. New approach is to use graphical user interface. Graphical user interface can be implemented using visual software's.

Traditionally visual basic is the most popular, versatile, suitable, simple and commonly used visual programming language to write efficient, compact and portable interfaces, drivers/software's.

The subject will enable the students to inculcate visual programming concepts and methodology used to write, debug, compile and execute simple visual basic programs using different powerful data types, built in visual controls and integrated visual basic environment (IDE) provided by Microsoft visual studio. Students will be exposed to event driven programming and bottom up approached used in objects oriented programming.

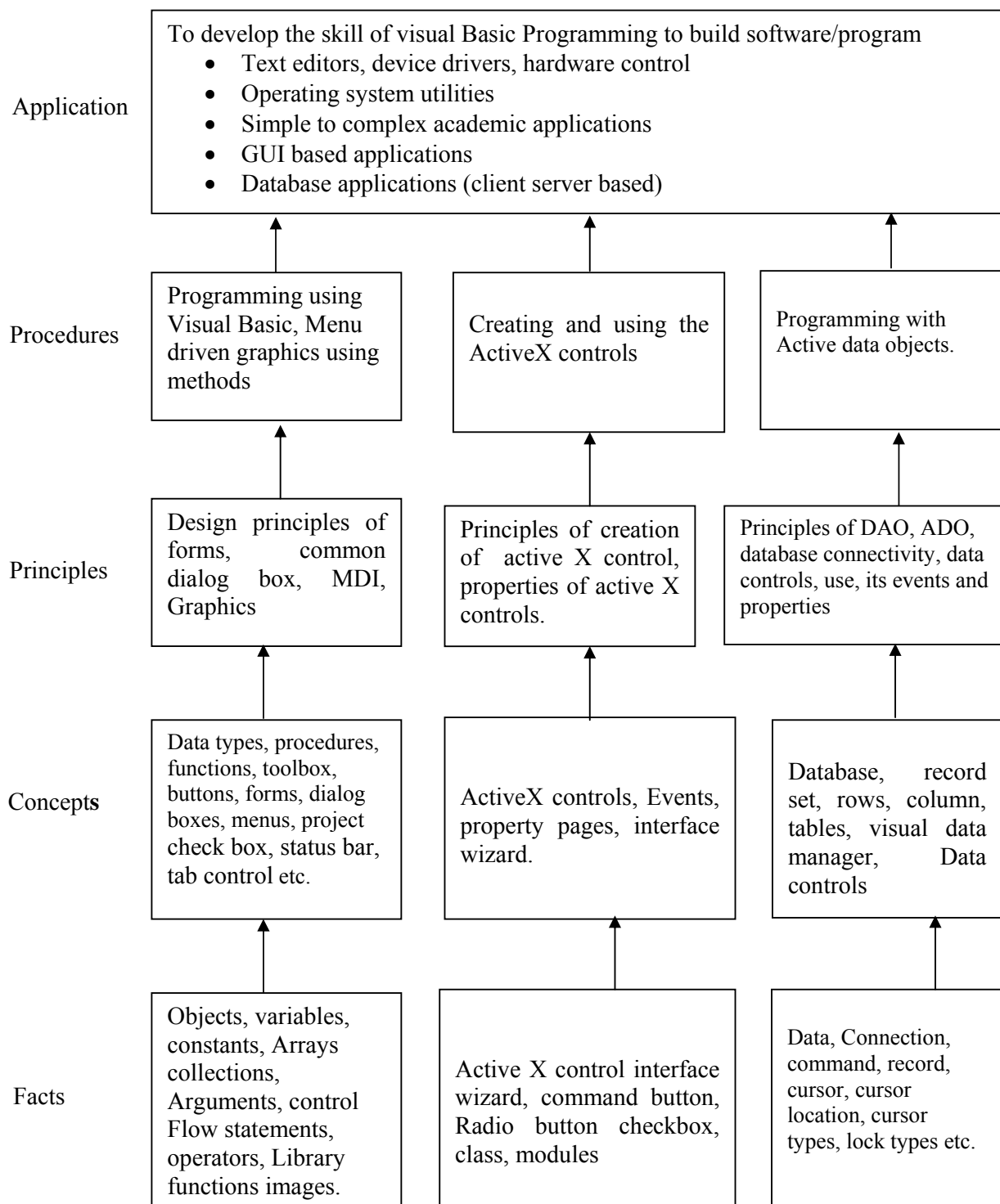
Students will understand how a complex interface can be easily implemented in visual basic with almost no programming expertise.

This course will lay the basic foundation of visual programming which will enable students to develop simple to complex programmable systems interfaces in the real world of work

General Objectives

Students will able to.

1. Learn visual programming development environment, concepts and methodology.
2. Use essential components (visual tools) of Visual software's
3. Develop the skill of visual basic programming to build custom standalone applications
4. Develop applications with Multiple documents interface (MDI) using common dialog, menus and graphics
5. Use ADO for database connectivity with different databases.
6. Create simple reports using data report, Seagate crystal reports and integrating it with visual basic
7. Develop applications using class modules

Learning Structure:

Theory

Name of Topics	Hours
Topic 1] Introduction to Visual Environment Specific Objectives: <ul style="list-style-type: none"> ➤ Familiar with IDE of Visual basic ➤ Use concepts of object based language ➤ Use basic elements of visual interface ➤ Use properties, events and methods at design time and runtime ➤ Create objects, place them on forms Contents: <p>1.1 Concepts of visual programming, object, features, properties, methods, events.</p> <p>1.2 Environment of VB – Menu bar, toolbar, project explorer, toolbox, properties window, form designer, form layout, immediate window.</p> <p>1.3 Concept of project, elements of projects, form, their properties, methods and events.</p>	02
Topic 2] Introduction to Visual Basic Specific Objectives: <ul style="list-style-type: none"> ➤ Use different data types ➤ Use powerful features of arrays and collections ➤ Write procedures and functions ➤ Call procedures and functions ➤ Differentiate between procedure and functions ➤ Use library functions for math and string operations ➤ Use Inputbox and MsgBox functions Contents: <p>2.1 Data types, variables, constants, arrays, collections</p> <p>2.2 procedures, Arguments, function, return values, control flow statements, loop statements, Nested control structures, exit statement</p> <p>2.3 Math operators & formulas, logical operators, string functions, special functions available in VB like Input Box (), Message Box (), Format ().</p>	02
Topic 3] Controls and Events Specific Objectives: <ul style="list-style-type: none"> ➤ Use basic controls ➤ Select appropriate controls for given data ➤ Set properties of different basic controls ➤ Call methods and events of basic controls ➤ Demonstrate the use of each control with simple examples Contents: <p>3.1 Basic controls: Text box, list Box , Combo Box , Scroll Bar, frame , Option button, checkbox, command button, OLE controls</p> <p>3.2 File, Drive, directory, Picture box, Image and timer controls .Designing a form using controls, concepts of event & properties, changing properties (runtime & design time) Important events of each control & creating applications using controls.</p>	02
Topic 4] Advance Controls & Events Specific Objectives: <ul style="list-style-type: none"> ➤ Add extrinsic controls in an application ➤ Use common dialog box control and its properties such open, save as, font, color, print and help ➤ Use rich text box to design simple ms-word like application ➤ Use and create explorer like utilities using tree view and list controls ➤ Familiar with windows common controls 	03

Contents: 4.1 Common Dialog Box controls, The Tree view and List, View controls, the rich textbox controls 4.2 Windows common controls – status Bar, Tab control, image list control, Important properties, changing properties at design or run time, event handling.	
Topic 5] Module, Class Module, Mdi, Menu Graphics Specific Objectives: <ul style="list-style-type: none"> ➤ Write class modules ➤ Define functions and procedures in class module ➤ Access functions and procedures from class module ➤ Use multiple document interface ➤ Design menu based applications such as notepad editor ➤ Work with graphic functions and methods Contents: 5.1 Concept of module, class module, using class module to define functions, procedures, variables and accessing them using objects 5.2 MDI- MDI form and child form, Creation and use in 5.3 Menu: Creating own menu using menu editor, popup menu. 5.3 Graphics: Basic controls – Line & shape control , line method, circle method, Pset method, RGB () Functions, Paint picture () method, Load picture () function.	03
Topic 6] Database and Report Specific Objectives: <ul style="list-style-type: none"> ➤ Create database ➤ Use ADO and its properties, methods and events ➤ Select appropriate concepts such as back-end and front-end ➤ Make database connectivity with different databases ➤ Generate report using Data Report and Crystal Report Contents: 6.1 Concept of database, Record, Record set, Data control & its important properties 6.2 validating data, entering data, visual data manager. 6.3 Programming with ADO (Active data objects), using ADO Objects at design time-connection, command, record set , parameter, Creating & closing a connection; executing a command, 6.4 Using ADO Objects at run time, attaching visual controls to record set at run time, Using delete, save, search, update exit, new, add, methods. 6.5 Report generation using data report and crystal report	04
Total	16

TERM WORK:-

Sr No.	Name of the Experiments
1	a) Study and Understand Visual Basic Environment b) Develop VB Project which accepts User Name & Password using three forms Login Form1 and Form2 to accept data, and Form3 to display data.
2	Design simple calculator to perform mathematical function using Control array like Windows Calculator.
3	Design GUI to Find Resistor Value from it's color code.
4	Display student data using structure in loop. Implement it using Class module & Procedures

5	Demonstrate list boxes features with sorted list and selected item transfer facility.
6	a) Design Color box using RGB function to observe color change using H- scroll bar. b) Design project to demonstrate file, folder & drive controls to explore drive & folders.
7	Design GUI for Testing AC series Circuit
	Practice Experiment / Exercise
8	a) Design project to implement Common Dialog box controls such as open, save, Color, Font, Printer & Help b) Design a menu structure like notepad using menu editor
9	Design MDI application with 4 child forms & arrange forms with cascade, Tile Horizontal, Tile Vertical arrangements
10	Design student database project using ADO connectivity in design time and runtime and MS access as backend database engine, with basic features such as add, edit, update, save, cancel, delete feature and generate Report using Data Report / Crystal Report
11	Develop mini VB Project

Reference Books:

Sr. No.	Author	Title	Publisher
01	MSDN library on Line Reference	--	From Microsoft MSDN Library
02	Evangelos Petroustus	Mastering VB6	WILEY India
03	Steven Holzner	Visual basic 6	Dream Tech. Press
04	Content Development Group	Visual Basic 6.0 Programming	Tata McGraw Hill
05	Mohammed Azam	Programming with visual basic 6.0	Vikas Publishers
06	Nel Jerka	The complete reference VB6	Tata McGraw Hill Publishing

Course Name : Electronics Engineering Group**Course Code : ET/EJ/EN/EX/IE/IS/IC/DE/EV/MU/IU/ED/EI****Semester : Fourth****Subject Title : Professional Practices-II****Subject Code : 17044****Teaching and Examination Scheme:**

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
--	--	03	--	--	--	--	50@	50

Rationale:

Most of the diploma holders join industries. Due to globalization and competition in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests.

While selecting candidates a normal practice adopted is to see general confidence, ability to communicate and attitude, in addition to basic technological concepts.

The purpose of introducing professional practices is to provide opportunity to students to undergo activities which will enable them to develop confidence. Industrial visits, expert lectures, seminars on technical topics and group discussion are planned in a semester so that there will be increased participation of students in learning process.

Objectives:

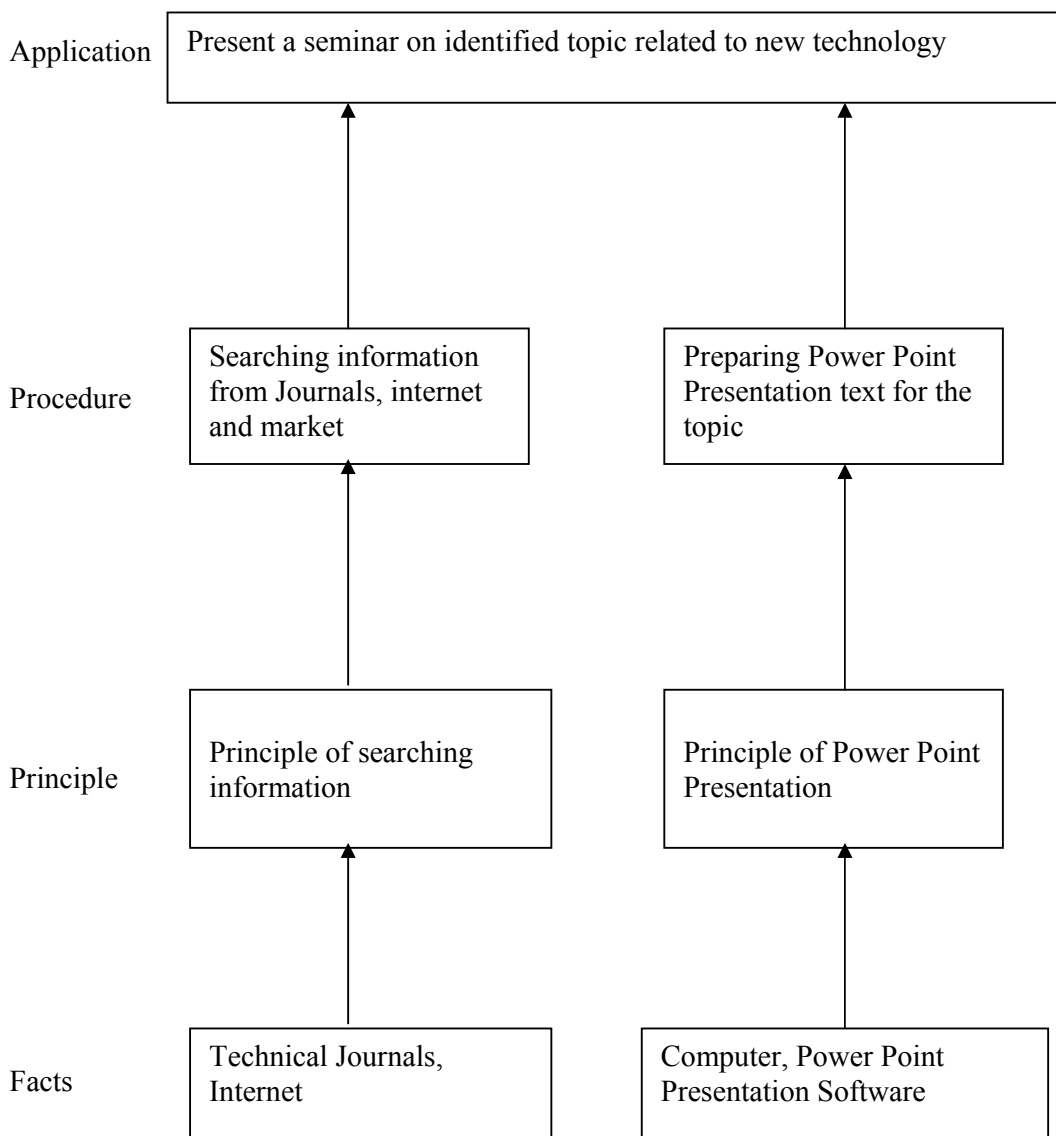
To develop the following skills:

Intellectual skills:

- 1) Analyze information from different sources.
- 2) Prepare reports.

Motor skills:

- 1) Present given topic in a seminar.
- 2) Interact with peers to share thoughts.
- 3) Prepare a report on industrial visit, expert lecture.

Learning Structure:

Contents:

Activity	Content	Hours
1	Industrial Visits Structured industrial visits be arranged and report of the same should be submitted by the individual student to form a part of the term work. Minimum two industrial visits may be arranged in the following areas/ industries : i) Electronic equipment manufacturing unit ii) Resistance Welding unit iii) Industrial automation unit iv) Sugar mill, Paper mill, Cement Industry. v) Railway station control room. vi) Telephone Exchange. vii) Any other suitable Industry.	16
2	Lectures by Professional / Industrial Expert to be organized from any of the following areas (Any three) i) Cyber laws. ii) Fiber optics communication system iii) Disaster management iv) Atomic energy v) Industrial Safety vi) Computer security systems/Ethical hacking. vii) Any other suitable topic viii) Introduction to Apprenticeship Training Scheme	08
3	Information Search : Information search can be done through manufacturers, catalogue, internet, magazines; books etc. and submit a report on one of the following topics: i) GPS ii) Market survey for motors used in electronic application iii) Electronic billing system. iv) Elevators installation and maintenance v) Any other suitable areas	06
4	Seminar : Seminar topic should be related to the subjects of fourth semester. Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time – 10 Minutes)	10
5	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 discussion may be selected by the faculty members.	08
Total		48

Learning Resources:**1. Books:**

Sr. No.	Author	Title	Publisher
01	NRDC, Publication Bi	Invention Intelligence	National Research Development

	Monthly Journal	Journal	Corporation, GOI.
02	DK Publishing	How things works encyclopedia	DK Publishing
03	Trott	Innovation mgmt.& new product development	Pearson Education
04	E.H. McGrath, S.J.	Basic Managerial Skills for All – Ninth Edition	PHI
05	Apprenticeship Training Scheme:- Compiled By – BOAT (Western Region), Mumbai, Available on MSBTE Web Site.		

2. Web sites

www.engineeringforchange.org
www.wikipedia.com
www.slideshare.com
www.teachertube.com

Course Name : All Branches of Diploma in Engineering & Technology

**Course Code : AE/CE/CH/CM/CO/CR/CS/CW/DE/EE/EP/IF/EJ/EN/ET/EV/EX/IC/IE/IS/
ME/MU/PG/PT/PS/CD/CV/ED/EI/FE/IU/MH/MI/DC/TC/TX/FG**

Industrial Training (Optional) after 4th semester examination.

Note:- Examination in Professional Practices of 5th Semester.

INDUSTRIAL TRAINING (OPTIONAL)

Rational:-

There was a common suggestion from the industry as well as other stakeholders that curriculum of Engineering and Technology courses should have Industrial training as part of the curriculum. When this issue of industrial training was discussed it was found that it will be difficult to make industrial training compulsory for all students of all courses as it will be difficult to find placement for all the students. It is therefore now proposed that this training can be included in the curriculum as optional training for student who is willing to undertake such training on their own. The institutes will help them in getting placement or also providing them requisite documents which the student may need to get the placement.

Details:- Student can undergo training in related industries as guided by subject teachers / HOD.

- The training will be for four weeks duration in the summer vacation after the fourth semester examination is over.
- The student undergoing such training will have to submit a report of the training duly certified by the competent authority from the industry clearly indicating the achievements of the student during training. This submission is to be made after joining the institute for Fifth semester.
- The student completing this training will have to deliver a seminar on the training activities based on the report in the subject Professional Practices at Fifth Semester.
- The student undergoing this training will be exempted from attending activities under Professional Practices at Fifth semester except the seminar.
- The students who will not undergo such training will have to attend Professional Practices Classes/activities of fifth semester and will have to complete the tasks given during the semester under this head.
- Their work will be evaluated on their submissions as per requirement and will be given marks out of 50. Or student may have to give seminar on training in Industry he attended.
- Institute shall encourage and guide students for Industry training.
- Evaluation:- Report of Training attended and delivery of seminar and actual experience in Industry will be evaluated in fifth semester under Professional Practices-III and marks will be given accordingly out of 50.