MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI
TEACHING AND EXAMINATION SCHEME FOR POST S.S.C. DIPLOMA COURSES

COURSE NAME : DIPLOMA IN ELECTRONICS & VIDEO ENGINEERING

COURSE CODE : EV

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	
2	Electronic Instrumentation	EIN	17435	03	--	02	03	100	40	25#	10	--	--	25@	10	
3	Radio Reception	RRE	17437	03	--	02	03	100	40	25#	10	--	--	25@	10	50
4	TV Signal Transmission System	TVS	17441	03	02	--	03	100	40	--	--	--	--	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	02	13	--	450	--	100	--	--	--	200	--	50

**	Industrial Training (Optional) Examination in 5th 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,   No Theory Examination, $ - Common to all branches, #* - Online Theory Examination,

β - Common to ET / EJ / EN / EX / IE / IS / IC / EV / DE / 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 5th 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.
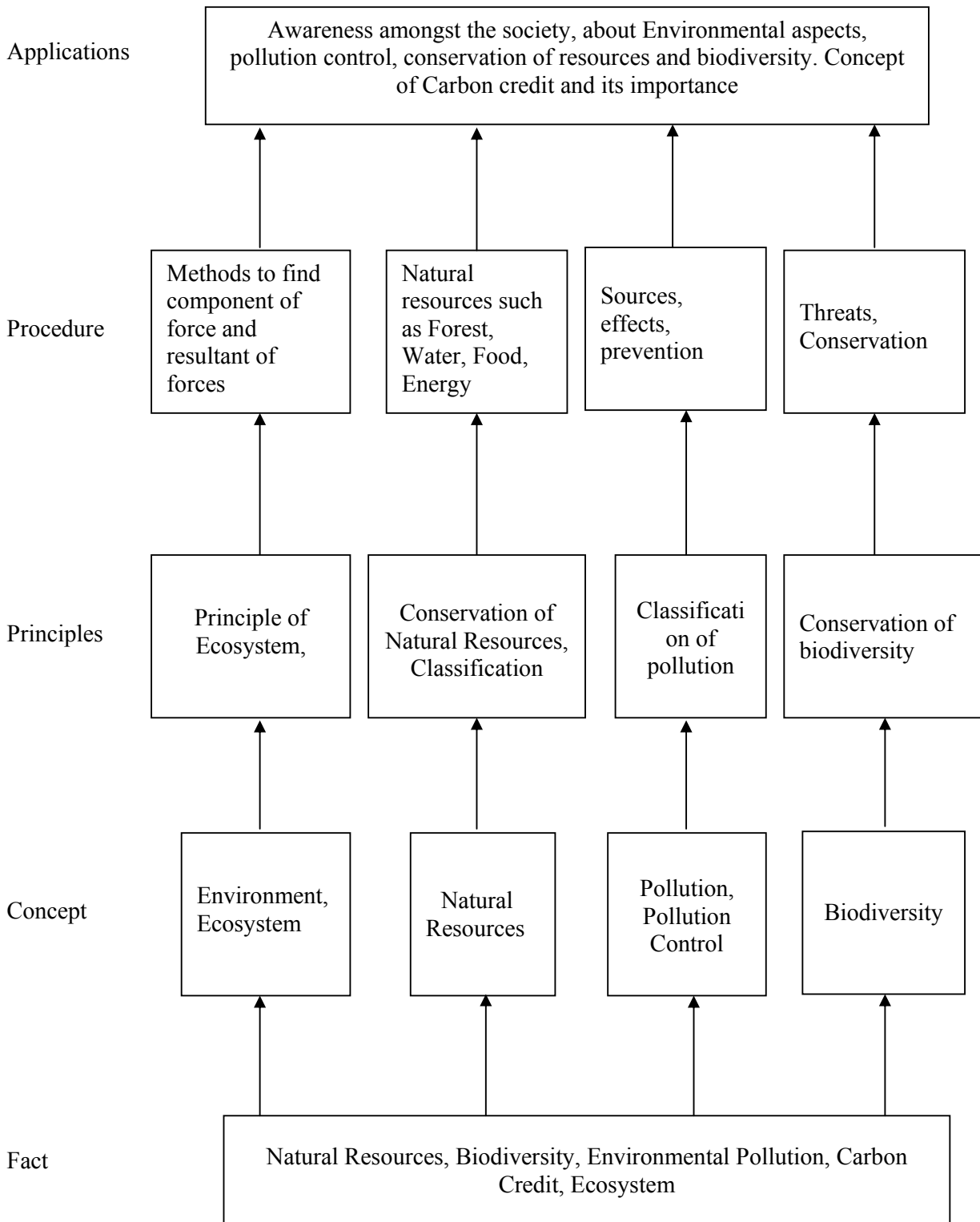
It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

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:

Applications	Awareness amongst the society, about Environmental aspects, pollution control, conservation of resources and biodiversity. Concept of Carbon credit and its importance

Procedure	Methods to find component of force and resultant of forces	Natural resources such as Forest, Water, Food, Energy	Sources, effects, prevention	Threats, Conservation

Principles	Principle of Ecosystem,	Conservation of Natural Resources, Classification	Classification of pollution	Conservation of biodiversity

Concept	Environment, Ecosystem	Natural Resources	Pollution, Pollution Control	Biodiversity

Fact	Natural Resources, Biodiversity, Environmental Pollution, Carbon Credit, Ecosystem

Theory:

Topic and Contents	Hours	Marks

Topic 1: Nature of Environmental Studies
Specific Objectives:
  ➢ Define the terms related to Environmental Studies
  ➢ State importance of awareness about environment in general public
Contents:
  • 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:
  ➢ Define natural resources and identify problems associated with them
  ➢ Identify uses and their overexploitation
  ➢ Identify alternate resources and their importance for environment
Contents:
2.1 Renewable and Non renewable resources
  • Definition
  • Associated problems
2.2 Forest Resources
  • General description of forest resources
  • Functions and benefits of forest resources
  • Effects on environment due to deforestation, Timber extraction, Building of dams, waterways etc.
2.3 Water Resources
  • Hydrosphere: Different sources of water
  • Use and overexploitation of surface and ground water
  • Effect of floods, draught, dams etc. on water resources and community
2.4 Mineral Resources:
  • Categories of mineral resources
  • Basics of mining activities
  • Mine safety
  • Effect of mining on environment
2.5 Food Resources:
  • Food for all
  • Effects of modern agriculture
  • World food problem
	04	10

Topic 3. Ecosystems
  • 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
  • Definition of Biodiversity
  • Levels of biodiversity
  • Value of biodiversity
  • Threats to biodiversity
	02	06

• Conservation of biodiversity		
Topic 5. Environmental Pollution • 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 • 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: • 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 • 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   : **Diploma in Electronics & Video Engineering**

Course Code   : **EV**

Semester   : **Fourth**

Subject Title   : **Electronic Instrumentation**

Subject Code   : **17435**

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:

       Instrumentation is an emerging field used in data detection, acquisition, analysis and control in industrial applications. Analog and digital instruments are mainly used to determine different process parameters. These instruments present the desired information in visual indication either in analog or digital form. Further, instrumentation deals with conversion of different physical parameters into electrical signal using various transducers.
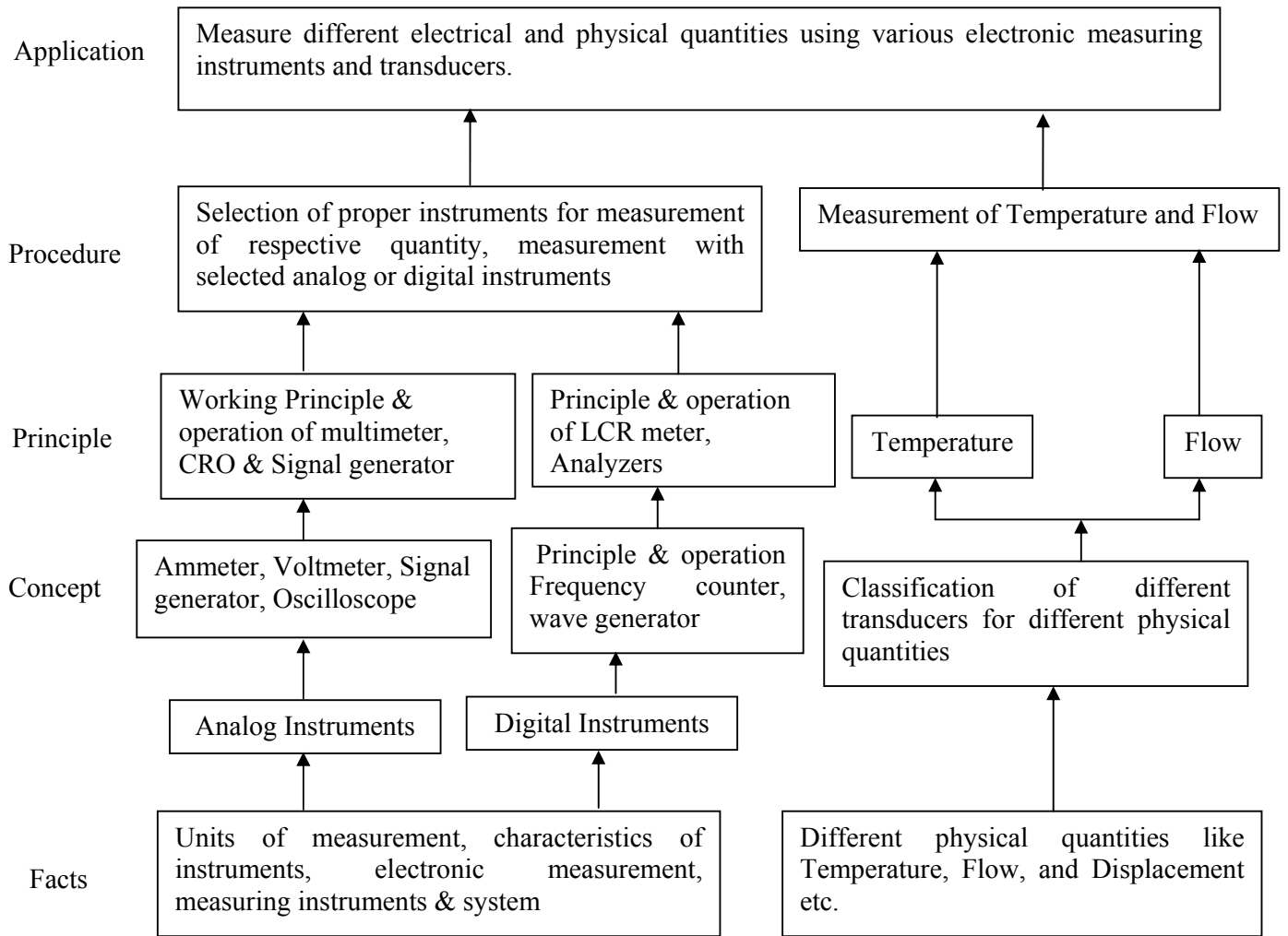
       This subject presumes that the students are familiar with basic utilization of measuring instruments. The era of this subject consists of the information about concepts, principles and procedures of analog and digital electronic measuring instruments and measuring techniques. With the help of transducers measuring instruments different physical parameters like temperature, pressure etc. are measured. 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:
The Students will be able to:
1. Understand the principle & operation of different measuring instruments.
2. Select the instrument for the measurement of specific electrical parameter.
3. Understand the procedure for fault finding in electronic systems.
4. Understand the nature and working of instrumentation system used in industries.

Learning Structure:

Application | Measure different electrical and physical quantities using various electronic measuring instruments and transducers.

Procedure | Selection of proper instruments for measurement of respective quantity, measurement with selected analog or digital instruments

Measurement of Temperature and Flow

Principle | Working Principle & operation of multimeter, CRO & Signal generator

Principle & operation of LCR meter, Analyzers

Temperature

Flow

Concept | Ammeter, Voltmeter, Signal generator, Oscilloscope

Principle & operation Frequency counter, wave generator

Classification of different transducers for different physical quantities

Analog Instruments

Digital Instruments

Facts | Units of measurement, characteristics of instruments, electronic measurement, measuring instruments & system

Different physical quantities like Temperature, Flow, and Displacement etc.

Theory Contents:

Topic No.	Theory	Hrs.	Marks
1	**Basics of Measurement:** **Specific Objectives:** ➢ **Define measurement and instrument.** ➢ **Classify various instruments.** **Contents** • Classification of Instruments: Absolute, Secondary Instruments • Definitions of Static characteristics of Instruments: Accuracy, Precision, Sensitivity, Resolution, Static error, Reproducibility, Drift, Dead Zone • Definitions of dynamic characteristics of Instruments: Speed of response, Lag, fidelity, Dynamic error • Types of Errors- Gross, Systemic, Random • Units of measurement of fundamental quantity	06	10
2	**Analog DC and AC Meters** ➢ **Draw the constructional diagram of PMMC meter.** ➢ **State the working principles of different types of DC/AC Voltmeter/Ammeter and list their specifications.** ➢ **Describe the working of analog multimeter** **Contents** • Classification of analog ammeter and voltmeter • Working principle and construction of PMMC instruments • Analog DC Ammeter: Shunt resistor type, Ayrton Shunt type • Analog DC Voltmeter: Multiplier voltmeter • Analog AC Voltmeter (No derivation)- Half Wave rectifier type, Full wave rectifier type, Multirange type • Analog AC Ammeter	06	12

3	**Digital Meters:**
	➢ **Draw block diagram and describe operation of different digital meters.**
	➢ **State the applications of digital meters**
	
	Contents
	• Concepts of ADC & DAC (Review) (No marks)
	• Advantages and Disadvantages of Digital Instruments and comparison with analog instruments
	• Block diagram, operation and applications of
	        Digital Frequency meter
	        Digital Voltmeter
	        DMM
	        LCR –Q meter
		06	12

4	**Oscilloscope**
	  ➢ **Draw the basic block diagram and describe the function of each block of CRO.**
	  ➢ **List and describe different applications of CRO.**
	 Contents
	  • CRO: Basic Block diagram and function of each block
	  • Function of delay line
	  • Explanation of waveform generation
	  • Applications of CRO:
	    Time & frequency measurement
	    Voltage measurement
	    Lissagous patterns for Phase and Frequency measurement
	  • Concept, block diagram and Operation of: Single beam dual trace & Dual beam Dual Trace CRO
	  • Block diagram, operation and applications of digital storage oscilloscope (DSO)
		08	16

5	**Topic 5: Signal generator and Wave Analyzer**
	  ➢ **Draw block diagram of signal generator and waveform analyzer and their working**
	  ➢ **Test the faults and rectify the faults in T.V. using pattern generator.**
	  ➢ **Draw block diagram of harmonic distortion analyzer and describe its working.**
	Contents
	5.1 Signal generators: 10 Marks
	  • Definition and need of signal generator
	  • Block diagram, operation and applications of :
	    AF and RF type signal generator
	    Function generator
	    Square and Pulse generator
	    Video pattern generator
	
	5.2 Wave analyzer: 10 Marks
	  • Definition and need of waveform analyzer
	  • Block diagram, operation and applications of :
	    Frequency selective wave analyzer
	    Harmonic distortion analyzer
	    Logic analyzer
	    Spectrum analyzer
		08	20

6	**Transducers**
	Specific Objectives:
	  ➢ **Draw and describe the block diagram of Instrumentation system.**
	  ➢ **Compare different Transducers**
	Contents
	  • 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
		08	14

	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)		

7	**Special Transducers and Measurements**
	  ➢ **Draw the construction and describe working of flow**
	    transducers.
	  ➢ **Draw the construction and describe working of**
	    Temperature measuring transducers.
	Contents
	  • Flow:
	   Definition
	  • Classification of flow measuring transducers:
	   Electromagnetic Flow meter
	   Ultrasonic flow meter- Time difference and Doppler Type
	  • Temperature :
	   Definition and units
	  • Classification of temperature measuring transducers:
	   Thermistors
	RTD – (PT-100) , 2 /3/4 wire systems (circuit diagram only)
	Thermocouple – Seeback & Peltier effect, Types J, K, R, S, T etc.
	          (Based on material , temperature ranges)
	<u>**Note:**</u> Each transducer should be studied on the basis of working
	    principle, construction, advantages, disadvantages and
	    applications.
		06	16

	Total	**48**	**100**

Practical
Skills to be developed:

Intellectual Skills:

➢ Selection of instruments based on applications

➢ Interpretation of results.

➢ Selection of transducer based on application.

Motor Skills:

➢ Selection of proper instrument with respect to parameter and range

➢ Proper connections and interfacing

➢ Testing of basic electronic circuits using these instruments

➢ Connection of different transducers with measuring system.

➢ Measurement of various physical parameters using transducers.

List of Practicals:

(Attach a separate sheet in the Manual covering the specifications of instrument/ equipment studied)

1. Draw the block diagram of Function generator. Indentify the blocks from circuit. Test and verify function outputs as per   specifications.

2. Understand the front panel controls of Dual trace CRO and to Measure frequency, voltage, phase difference (by time measurement) using CRO.

3. Measure time period and frequency of sine, square and triangular waves using CRO.

Measure frequency and phase difference of unknown signals with the help of Lissagous pattern by using CRO.

4. Prepare the fault finding flow chart for Power supply using multimeter.

5. Measure frequency, voltage and modulation index of a signal from AF/RF standard signal generator using CRO.

6. Study different output patterns obtained from Pattern generator and use of these patterns to test the performance of different sections of T.V.

7. Draw the layout and test the circuit of PA system.

8. Displacement measurement using LVDT.

9. Flow measurement using electromagnetic flowmeter/ultrasonic flowmeter.

10. Temperature measurement using RTD (PT-100).

11. Temperature measurement using Thermocouple (using any one from R, J, K)

Learning Resources:

User's manuals of various instruments.

1. **Books:**

Sr. No.	Author	Title	Publisher
01	A.D. Helfrick W.D. Cooper	Modern electronic instrumentation & Measurement techniques	PHI Learning Pvt. Ltd. New Delhi.
02	Kalsi .H.S.	Electronic Instrumentation	Tata Mc-Graw Hill
03	A.K Sawhney	Electrical & Electronic Measurements & Instrumentation	Dhanpat Rai & Sons
04	S K Singh	Industrial Instrumentation and Control	Tata McGraw Hill Education Private Limited, New Delhi
05	D. Patranabis	Principles of Industrial Instrumentation	Tata McGraw Hill Publishing Co. Ltd; N. Delhi
06	Rangan Mani & Sharma	Instrumentation Systems and Devices	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 Electronics & Video Engineering

Course Code : EV

Semester : Fourth

Subject Title : Radio Reception

Subject Code : 17437

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:

Radio reception is important part of wireless communication system. It is necessary for students to understand the concepts of radio receiver and other related equipments and process of generation, radiation and propagation of radio waves.

The subject contains concept of radiation and propagation of radio waves, Transmission lines, Antennas, characteristics and operation of AM and FM radio receivers.
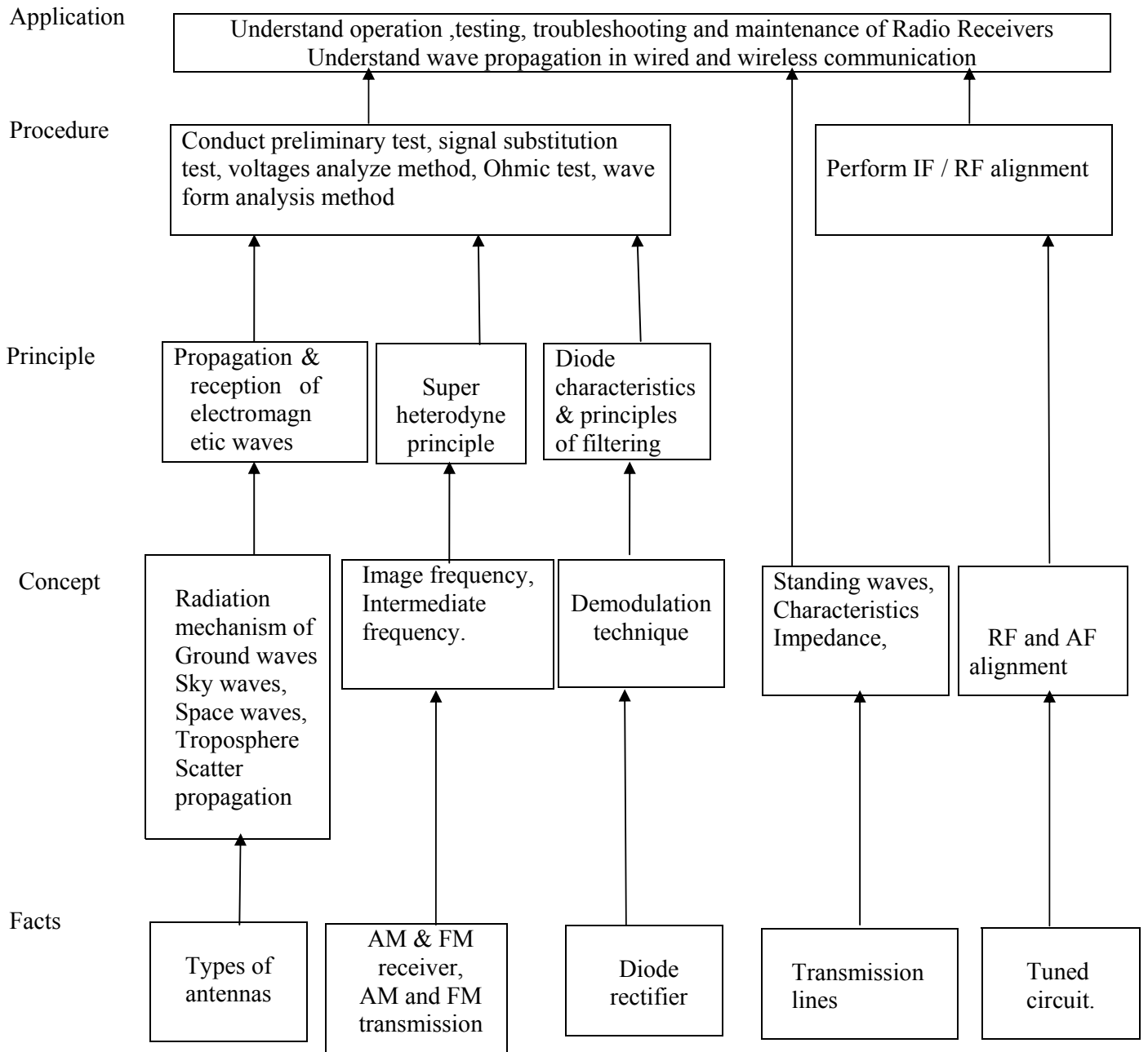
The study of this subject will be useful in understanding various telecommunication system such as TV receivers, Satellite & Radar systems and mobile communication.

General Objectives:

Students will able to

1) Understand propagation of electromagnetic waves

2) Understand basic principles of transmission lines.

3) Understand construction working principle &operation of various types of antennas.

4) Understand block diagram of AM & FM radio receivers and their operation.

5) Understand alignment procedure for AM & FM radio receiver.

Learning Structure:

Application

Understand operation ,testing, troubleshooting and maintenance of Radio Receivers
Understand wave propagation in wired and wireless communication

Procedure

Conduct preliminary test, signal substitution test, voltages analyze method, Ohmic test, wave form analysis method

Perform IF / RF alignment

Principle

Propagation & reception of electromagnetic waves

Super heterodyne principle

Diode characteristics & principles of filtering

Concept

Radiation mechanism of Ground waves Sky waves, Space waves, Troposphere Scatter propagation

Image frequency, Intermediate frequency.

Demodulation technique

Standing waves, Characteristics Impedance,

RF and AF alignment

Facts

Types of antennas

AM & FM receiver, AM and FM transmission

Diode rectifier

Transmission lines

Tuned circuit.

Theory Contents:

Topic No	Theory	Hrs.	Marks

1	**Wave Propagation**
	Specific objectives:
	 Students will be able to
	  ➢ Explain the concept of electromagnetic waves.
	  ➢ Explain different types of radio wave propagation.
	Contents:
	• Fundamental of electromagnetic waves.
	• Definition of radiation, reception, attenuation, absorption & polarization.
	• Propagation of waves: Ground waves, Sky waves: ionosphere & its effects, actual height, virtual height, skip distance, critical frequency, max usable frequency, Space waves-fading, Tropospheric scatter propagation.
		08	16

2	**Transmission Line** **Specific objective:** ➢ To state understand various characteristics of transmission line and losses. **Contents:** **2.1** **[10]** • Basic principle of transmission line. • Equivalent circuit representation of transmission line. • Characteristics impedance of transmission line. • Losses in transmission line. 2.2 **[08]** Standing waves: • SWR • VSWR • Reflection coefficient. • Quarter & half wave length lines. • Reactance properties of transmission line.	12	18

3	**Antenna**
	Specific objective:
	  ➢ To explain construction, working principle, operation and characteristics of various antennas.
	  ➢ To plot radiation pattern of antenna
	Contents:
	3.1 Basics of antenna. **[12]**
	• Electromagnetic radiation.
	• Hertzian Dipole.
	• Resonant antenna, radiation pattern and antenna length calculation.
	• Non resonant antenna (directional antenna).
	• Definition: Antenna gain, effective radiated power, directivity, power gain (ERP), antenna resistance, bandwidth, beam width and polarization.
	3.2 **[12]**
	• Directional high frequency antenna: Dipole arrays, Folded
		10	24

	dipole antenna, Yagi uda antenna • UHF & microwave antenna: Focal feed parabolic reflector, Cassegrain feed parabolic reflector, Horn antenna. • Wideband & special purpose antenna: Loop antenna, Phased array		
4	**AM Radio Receiver.** **Specific objective:** ➢ Explain operation TRF and super heterodyne receivers. ➢ Define characteristics of AM radio receiver. ➢ State the procedure for alignment of TV receiver ➢ To understand concept of AGC. **Contents:** 4.1 AM Receiver [12] • Block diagram of tuned radio receiver and its working. • Block diagram of superhyterodyne receiver, function of each block and its working. • Characteristics of AM radio receiver: Sensitivity, Selectivity. Adjacent channel selectivity, image signal rejection ratio Frequency changing & tracking. 4.2 A M Receiver Alignment [12] • Choice of intermediate frequency used for different application. • circuit diagram, operation and input and output voltages of practical diode detector. • Alignment of AM radio receivers: Necessity of alignment. RF alignment, IF alignment, Selectivity, sensitivity, fidelity, dynamic range of radio receiver, simple AGC circuit	10	24
5	**FM Radio Receiver** **Specific objective:** ➢ To draw block diagram of FM radio receiver. ➢ To explain types of FM demodulators circuit. ➢ To state necessity of alignment of radio receiver and procedure of RF & IF alignment carried out in AM radio receivers. Contents: [18] Block diagram & operation of FM radio receiver, Circuit diagram & operation of amplitude limiter, Circuit diagram and operation FM Demodulators: Slope detector, Balance slope detector, Foster see lay detector, Ratio detector, PLL based FM demodulator, concept of AFC.	08	18
	Total	**48**	**100**

Practical:
Skills to be developed

Intellectual skills

1. To incept, analyze & record transmission line properties.

2. To study directional pattern of any or given antenna using field strength meter.

3. To apply AM input from AM generator to the radio receiver.

4. To identify the different stages of AM radio receiver.

5.   To identify components & follow the instruction as given.

6.   To analyze & record voltages at different test points of AM radio receiver.

7.   To analyze frequency adjustment of RF & IF stage.

8.   To locate the fault by logical analysis of symptoms.

9.   To verify the output of each stage with standard values.

Motor Skills

1.   Installing and testing of experimental set up and tabulate the reading.

2.   Skill to connect the instrument plots the directional pattern of antenna on polar paper.

3.   Skill to draw the layout of AM radio receiver.

4.   Skill to measure the voltages at the different test point using DMM as per procedure.

List of Practical:

1.   To measure parameters and attenuation of transmission line

2.   To measure frequency characteristics and stationary waves of transmission line.

3.   To plot directional pattern of given antenna.

4.   To observe different section & draw layout of AM radio receiver and to measure the voltages of different section of transistorized AM radio receiver.

5.   To observe different section & draw layout of FM radio receiver and to measure the voltages of different section of transistorized FM radio receiver.

6.   To calculate bandwidth & plot graph between output voltages & input freq. of ratio detector.

7.   To plot the sensitivity characteristics curve of AM radio receiver.

8.   Observe input and output waveforms of ratio detector.

9.   IF alignment in AM radio receiver.

10. To observe symptoms, do logical analysis and rectify the fault in AM radio receiver.

11. To observe symptoms, do logical analysis and rectify the fault in FM radio receivers.

List of Assignments:

1.   List antenna specifications :Antenna gain, effective radiated power, Directivity for Yagi-Uda antenna, Dish antenna and Loop antenna

2.   State Frequency Band allotted to AM radio Broad casting station. List AM program and allotted frequency band.

3.   State Frequency Band allotted to FM radio Broad casting station. List FM program and allotted frequency band.

List of Equipments:

1. CRO, Signal generator, DMM.
2. Transmission line trainer kit, Antenna parameter trainer kit, AM radio receiver, FM radio receiver.

Learning Recourses:

  1. Books:

Sr. No.	Title	Author	Publisher
01	Electronics Communication Systems	George Kennedy	Mc Graw – Hill Book Co. Ltd. Singapore.
02	Analog Communication	V. Chandra Sekar	Oxford University Press
03	Communication Electronics	Frenzil	Mc Graw – Hill Book Co. Ltd. Singapore
04	Electronics Communication Systems	Wayne Tomasi	Pearson

  2. Web sites:

www.csus.edu/indiv/n/ngw/EEE-272/Antenna.ppt

www.emergencyradio.ca/course/lesson-6%20Antenna.ppt

www.emergencyradio.ca/course/lesson-7%20propagation%201010.ppt

Course Name   : **Diploma in Electronics & Video Engineering**

Course Code   : **EV**

Semester   : **Fourth**

Subject Title   : **TV Signal Transmission System**

Subject Code   : **17441**

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:

Transmission plays an important role for processing of signals. The signals are transmitted in different ways i.e. wire communication, wireless communication and wavelength communication.

This subject deals with the concept of the TV signal transmission for analog and digital TV system depending on the techniques for processing the signal is being transmitted from the transmitter, CVS & CCVS.

The topic CVS signals useful to understand the basic concept of TV signal generation & transmission.

Thus student will learn different requirement of signal for TV transmission. For learning this subject student should know the concept of analog & digital signals as well as electromagnetic spectrum.

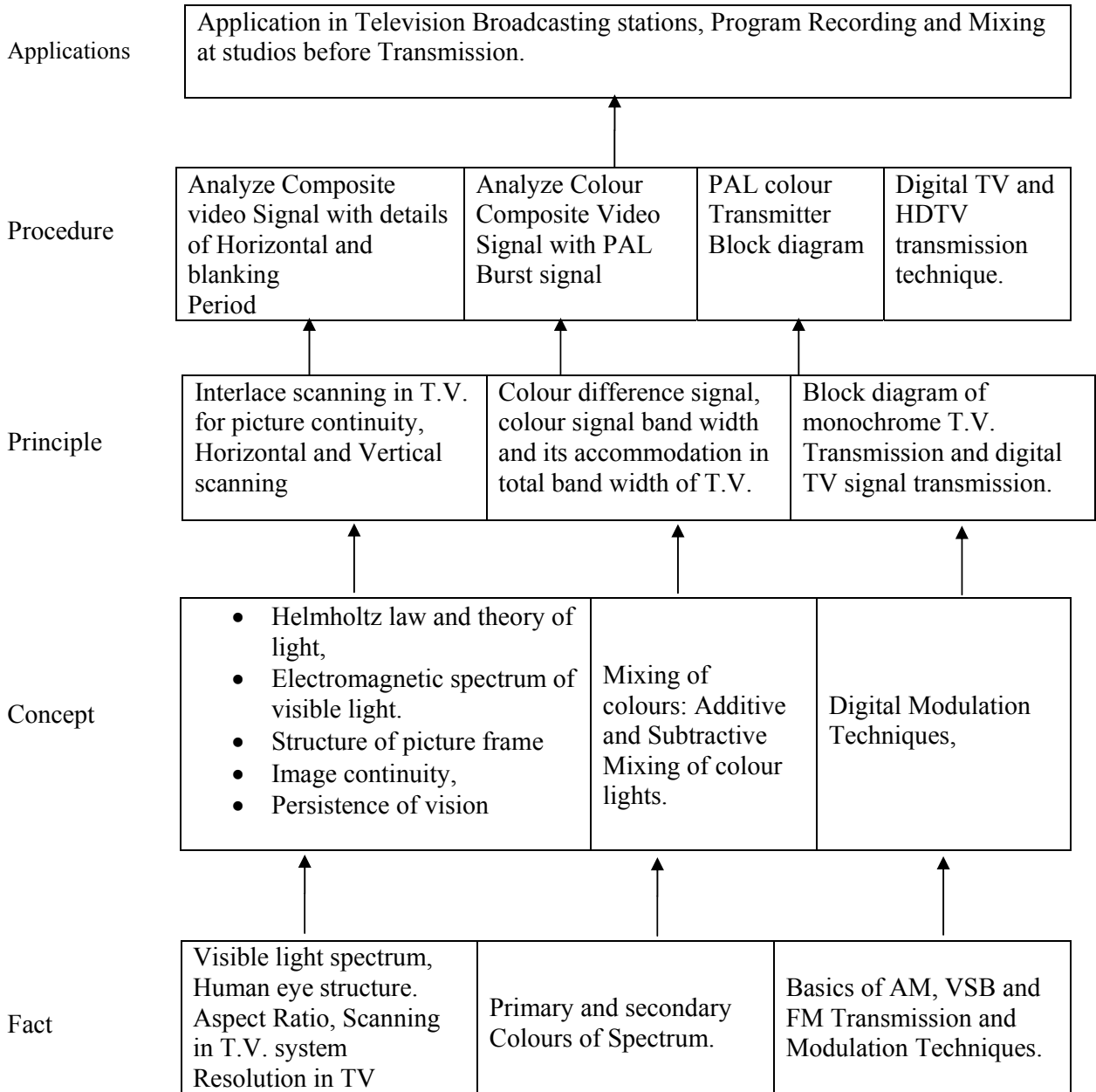Thus students will be aware the subject of TV Receiver in further Semester.

General Objectives.

Students will able to:

- Understand the basic concepts of TV Transmitter.
- Analyze the details of CVS & CCVS signals.
- Study the details of color burst signals.
- Visualize the concept of color theory.
- Understand function of B/W & color TV transmitter for PAL system.
- Understand the transmission of digital TV signal.

Learning Structure:

Applications	Application in Television Broadcasting stations, Program Recording and Mixing at studios before Transmission.			

↑

Procedure	Analyze Composite video Signal with details of Horizontal and blanking Period	Analyze Colour Composite Video Signal with PAL Burst signal	PAL colour Transmitter Block diagram	Digital TV and HDTV transmission technique.

↑   ↑   ↑

Principle	Interlace scanning in T.V. for picture continuity, Horizontal and Vertical scanning	Colour difference signal, colour signal band width and its accommodation in total band width of T.V.	Block diagram of monochrome T.V. Transmission and digital TV signal transmission.

↑   ↑   ↑

Concept	• Helmholtz law and theory of light, • Electromagnetic spectrum of visible light. • Structure of picture frame • Image continuity, • Persistence of vision	Mixing of colours: Additive and Subtractive Mixing of colour lights.	Digital Modulation Techniques,

↑   ↑   ↑

Fact	Visible light spectrum, Human eye structure. Aspect Ratio, Scanning in T.V. system Resolution in TV	Primary and secondary Colours of Spectrum.	Basics of AM, VSB and FM Transmission and Modulation Techniques.

Theory:

Topic No	Contents	Hours	Marks
1	**T.V. Fundamentals** Specific Objectives: ➢ Understand the fundamentals of TV transmission ➢ Understand the different requirements for TV signal ➢ Understand the purpose of VSB transmission. Contents: 1.1 Perception of vision & Gross Structure, Concept of persistence of vision, Application of persistence of vision for motion pictures and television, aspect ratio, image continuity, Interlace scanning, scanning periods, horizontal resolution, vertical resolution, Kell factor, Concept of gross structure of TV system and perceiving image continuity in TV system, aspect ratio, scanning, H and V Resolution, kell factor, progressive and interlace scanning, bandwidth for TV signal, interlace error. [14] 1.2 Vestigial side band transmission for T.V. Signal, VSB transmission, Diagrammatic representation of VSB, Bandwidth for color signal, brightness, contrast, viewing distance, luminance. [04]	08	18
2	**Composite Video Signal** Specific Objectives: ➢ Draw the CVS for TV signal. ➢ List the standards used for TV Signal transmission. ➢ Designate band allocation for TV Transmission. Contents: 2.1 [10] • Pedestal height, Blanking pulses (H& V) Color Bust, Horizontal sync. Pulse details, vertical sync. Pulse details, Equalization Pulses, D.C. Level • Diagrammatic representation of CVS: Purpose of blanking pulses, pedestal height. Details of H blanking period and purpose of each time allocation. Purpose of Colour Burst Signal and its placement. Details of V blanking period. Requirement of serrated V-Sync pulses Purpose of equalizing pulses. • CCIR- B standards for colour signal transmission, List CCIR-B standards for PAL Colour TV, T.V. channel allocation for band-I and band- III- Different channel allocation & their comparison, Purpose of channel allocation. [08]	10	18
3	**Monochrome T.V. Transmitter** Specific Objectives: ➢ Explain the modulation techniques used for TV signal Transmission. ➢ Describe the function of different camera tubes. ➢ Explain the function of monochrome TV transmission. Contents: 3.1 Audio and video signal transmission, FM for sound signal and AM for Picture signal, Positive and negative modulation with proper waveform and comparison [04] 3.2 Camera tubes, Block schematic of Silicon Diode Array, Videocon camera and its working, Schematic diagram of CCD Camera and its	10	16

		working, Block diagram of Colour camera and its function. [08] 3.3 Block diagram of monochrome T.V. Transmitter, Block diagram of B/W TV Transmitter and function of each block. [04]		

4		**Colour Theory**
		Specific Objectives:
		    ❯ Explain fundamentals of Colour Theory
		    ❯ Analyze human eye response to different colours.
		    ❯ Visualize the concept of mixing of colours.
		Contents:
		4.1 [10]
		  • Visible light spectrum, Nature of light, Draw visible light spectrum.
		  • Human eye response to different colours. Construction of Human eye.
		  • Color theory:- Primary and Secondary colors, Additive and Subtractive Mixing, Grassman's Law of colour mixing., Hue, Saturation, Luminance and Chrominance Signal.
		  • Colour Difference signal: Compatibility of colour signal transmission and factors to be considered for compatibility, Purpose of colour difference signals. Generation of colour difference signals with the help of block diagram, Elimination of (G –Y) Signal. Bandwidth of colour difference signal.
		4.2 [08]
		  • Frequency interleaving, Utilization of interleaved space for colour signal transmission, Choice of colour sub-carrier frequency, Calculation of colour sub-carrier frequency, Factors influencing the choice of colour sub-carrier, Weighted colour vectors U and V, Concept of over-modulation of colour signals, Requirement of weighted factors, Calculations of weighted factors, Phasor diagram for weighted and unweighted primary and secondary colours.
		  • Block Diagram and concept of Quadrature Amplitude Modulation. Block diagram and working of QAM for PAL system.
			08	18

5		**PAL Transmitter**
		Specific Objectives:
		    ❯ Explain the basic principles of PAL Transmitter
		Contents:
		5.1 PAL – V switching [06]
		  • Elimination of differential phase error in PAL system, Advantages of PAL system, Describe concept of PAL-V switching and its purpose with the help of phasor diagram, requirement of PAL burst or swinging burst signal, specifications of PAL burst signal. Selection of exact PAL colour sub-carrier frequency Factors influencing to select exact PAL colour sub-carrier frequency.
		5.2 Bandwidth for transmitted PAL colour resultant [04]
		  • Placement of PAL colour signal in VSB of TV Transmission, selection of bandwidth for colour signal over luminance signal, Suppressed colour sub-carrier transmission.
		5.3 Colour composite video signal [08]
			06	18

	• Draw CCVS and label it, Block diagram of PAL Encoder and function of each block with output waveforms, Block diagram of PAL Transmitter and function of each section.		
6	**Digital TV Transmission** Specific Objectives: ➢ Explain the basic fundamentals of Digital TV Transmission ➢ Explain the concept of HDTV transmission. Contents: 6.1 [06] • Concept of digital TV Transmission, Basic block diagram of digital TV signal transmission and its working. Characteristics of Digital TV Signal. Advantage & Disadvantage of digital TV Transmission 6.2 [06] • Features of HDTV Transmission& channel, Features of High Definition Signal. Block diagram of HDTV signal transmitter and it's working. Characteristics of HD Signals and System	06	12
	Total	**48**	**100**

Practical:

Intellectual Skills:
- Select measuring instruments on the basis of range, least count, precision and accuracy required for measurement.
- Record and analyze the observations.
- Interpret the results from observations and calculations.

Motor Skills:
- Proper handling of instruments.
- Measuring voltages and current at different stages accurately.
- Observe the phenomenon and to list the observations in proper tabular form.
- Follow proper procedure while performing the experiment.
- Observe, Draw and Analyze the waveforms at different stages.

List of Experiments:
(For class size 60, batch size 20 experiments shall be conducted in cyclic order with group of 4 to 5 students.)
1. To observe, draw and analyze the output CVS waveform of pattern generator for monochrome bar pattern.
2. To observe, draw and analyze the output CVS waveform of pattern generator for monochrome Chessboard pattern.
3. To observe, draw and analyze the output CVS waveform of pattern generator for Colour bar pattern.
4. To observe, draw and analyze the output CVS waveform of pattern generator for Colour cross edge and colour dot patterns. (Horizontal and Vertical Sync pulses to be analyzed.)
5. To observe and analyze the video camera output signal on CRO.

6. To perform video recording and transmit the signal through transmission link and observe the same on TV receiver.

7. Visit to Doordarshan Kendra to understand the concept of C.T.V. transmission. Write a report of it.
   - Students should observe how synchronizing pulses are inserted.
   - Students should observe the switching of different cameras at studio.
   - Students should understand the concept of relay or retransmission of same programme.
   - Students should observe and understand the mixing of audio and video signals before transmission.(Function of Combining Network)

List of Assignments:

1) A) Persistence of vision and its use for image continuity.

   B) Explanation of gross structure of TV

   C) Horizontal and vertical resolution and their use in calculation of No. of lines and video bandwidth.

   D) Total bandwidth of channel and its distribution in VSB.

2) A) Representation of composite video signal for one or two horizontal line for a given pattern of frame.
   - Concept of composite video signal for horizontal lines and explanation & functioning of each part of that.
   - Vertical blanking details their requirements and need for serration and equalizing pulses.

3) A) Camera functioning and working.

   B) Different types of camera tubes and their working.

4) A) Terms related to Monochrome and colour T.V. and their explanation. E.g. Brightness, luminance, Hue, contrast etc.

   B) Mixing of colours, Grass man's law

   C) Compatibility and its factors for Monochrome and colour TV.

5) A) Colour difference signals and their requirement.

   B) Positive and negative modulation.

   C) Elimination of (G-Y) signal.

   D) Frequency interleaving and placing of colour sub-carrier signal in bandwidth.

6) A) Over-modulation of colour signals and how to over come from that.

   B) Factors influencing choice of colour sub-carrier signal.

   C) QAM for PAL system.

   D) Phasor diagrams of weighted and unweighted colour signals.

7) A) Block diagram level study of monochrome T.V. Transmissions.

   B) PAL V switching and its purpose.

8) A) Picture and sound transmission as AM & FM respectively Justify.

   B) PAL Encoder block diagram and its working.

9) A) Study the concept of digital TV transmission.

   B) Study the concept of HDTV transmission.

Learning Resources:

1. **Books:**

Sr. No.	Title	Author	Publisher
01	Television & Video Engg.	Dhake	Tata Mc grow Hill New Delhi
02	Modern T.V. Practice	R.R.Gulati	Wiley Eastern Ltd. London.
03	Colour T.V. Principle & Practices	R.R.Gulati	New Age International Ltd. Delhi.
04	Basic T.V. & Video System	Barnad Grobe	Mac- GRaw Hill Ltd., New York
05	Colour T.V. & Video Technology	Maini	PHI Publication, New Delhi

2. **Websites**

   1. http://assets.cambridge.org/97805218/96023/excerpt/9780521896023_excerpt.pdf2.

   2. http://en.wikipedia.org/wiki/Television

   3. http://www.ustudy.in/node/923

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.
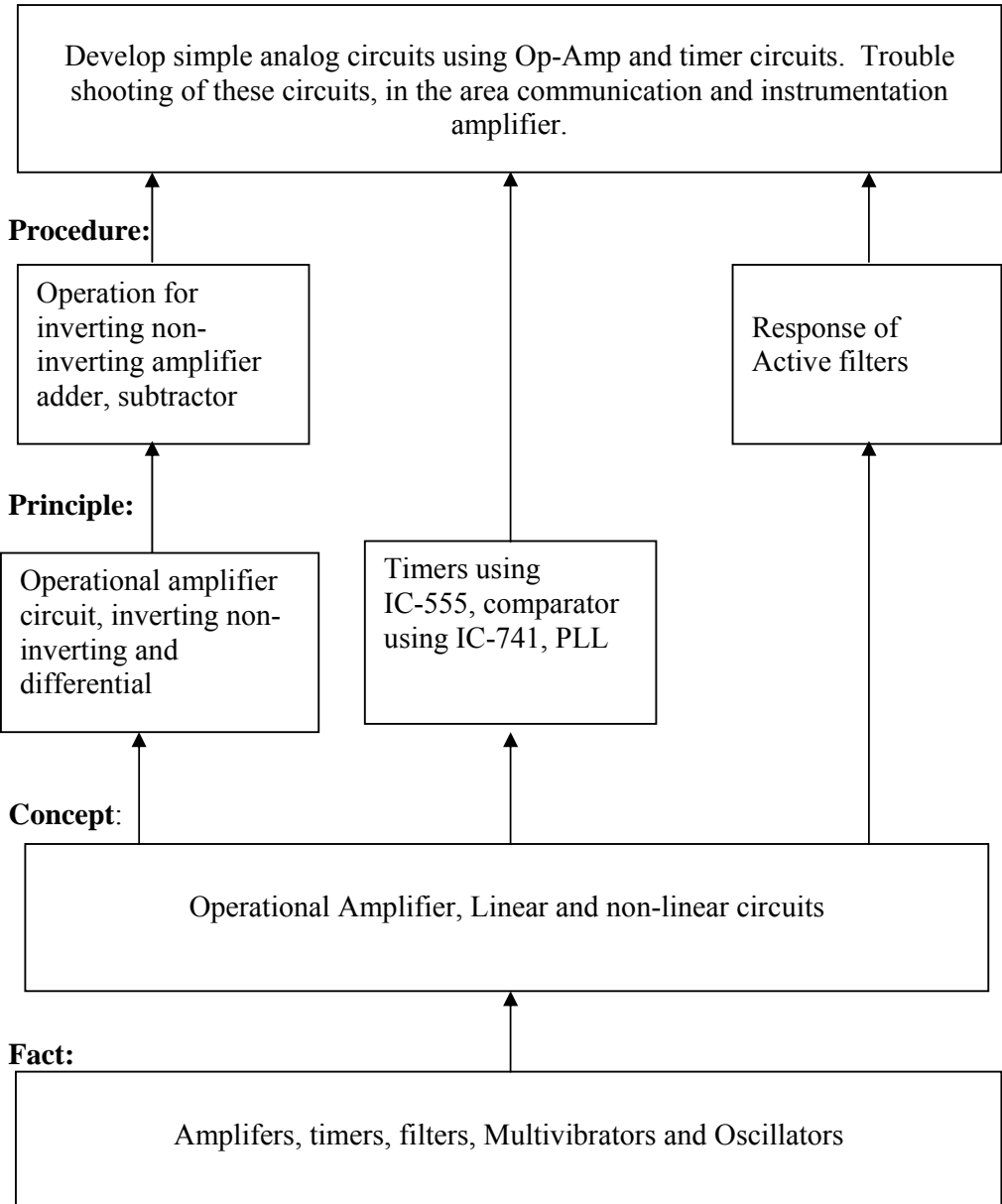
General Objectives:

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:

> Develop simple analog circuits using Op-Amp and timer circuits. Trouble shooting of these circuits, in the area communication and instrumentation amplifier.

Procedure:

> Operation for inverting non-inverting amplifier adder, subtractor

> Response of Active filters

Principle:

> Operational amplifier circuit, inverting non-inverting and differential

> Timers using IC-555, comparator using IC-741, PLL

Concept:

> Operational Amplifier, Linear and non-linear circuits

Fact:

> Amplifers, timers, filters, Multivibrators and Oscillators

Contents: Theory

Topic	Content	Hours	Marks

1	**Operational Amplifier (Op-Amp):**
	Specific Objectives :
	  ➢ Draw labeled block diagram of Op-Amp
	  ➢ Specify and define Different parameters of Op-Amp
	  ➢ Interpret ideal transfer characteristics of Op-Amp
	Contents:
	  • 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
	  ➢ 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:
	  ➢ 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

	Circuit diagram, operation, derivation of output voltage Equation. advantages and applications of Instrumentation amplifier. Pin diagram pin functions and specifications of IC LM 324 Voltage to current converter (with floating load, with grounded load) Current to voltage converter. **3.2** Sample and hold circuit. [16] Logarithmic and antilogarithmic amplifiers (using Diodes) Analog divider and analog multiplier Comparator: Circuit diagrams and operation of • Zero crossing detector, • Schmitt trigger, • Window detector, • Phase detector, • Active peak detector, • Peak to peak detector		
4	**Filters:** Specific Objectives: ➢ Distinguish the types of filter ➢ Explain active and passive filter ➢ Explain different parameters of filter. Contents: • 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	**Timers** Specific Objectives: ➢ Draw block diagram of IC 555 ➢ Understand industrial applications of IC 555 ,565 5.1 Introduction to timer IC 555 [10] • 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. 5.2 Phase Lock Loop • 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:
	  ➢ Explain concept of oscillators
	  ➢ Explain different types of oscillators
	  ➢ Develop multivibrators and oscillators for given values.
	Contents:
	  • 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: • 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: • 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 • 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 Group

Course Code : ET/EJ/IE/IS/EN/EX/IC/MU/EV/DE/IU/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:

Application

To develop the skill of visual Basic Programming to build software/program
- Text editors, device drivers, hardware control
- Operating system utilities
- Simple to complex academic applications
- GUI based applications
- Database applications (client server based)

↑   ↑   ↑

Procedures

| Programming using Visual Basic, Menu driven graphics using methods | Creating and using the ActiveX controls | Programming with Active data objects. |

↑   ↑   ↑

Principles

| Design principles of forms, common dialog box, MDI, Graphics | Principles of creation of active X control, properties of active X controls. | Principles of DAO, ADO, database connectivity, data controls, use, its events and properties |

↑   ↑   ↑

Concepts

| Data types, procedures, functions, toolbox, buttons, forms, dialog boxes, menus, project check box, status bar, tab control etc. | ActiveX controls, Events, property pages, interface wizard. | Database, record set, rows, column, tables, visual data manager, Data controls |

↑   ↑   ↑

Facts

| Objects, variables, constants, Arrays collections, Arguments, control Flow statements, operators, Library functions images. | Active X control interface wizard, command button, Radio button checkbox, class, modules | Data, Connection, command, record, cursor, cursor location, cursor types, lock types etc. |

Theory

Name of Topics	Hours

Topic 1] Introduction to Visual Environment
Specific Objectives:
  ➢ **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:
1.1 Concepts of visual programming, object, features, properties, methods, events.
1.2 Environment of VB – Menu bar, toolbar, project explorer, toolbox, properties window, form designer, form layout, immediate window.
1.3 Concept of project, elements of projects, form, their properties, methods and events.
	02

Topic 2] Introduction to Visual Basic
Specific Objectives:
  ➢ **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:
2.1 Data types, variables, constants, arrays, collections
2.2 procedures, Arguments, function, return values, control flow statements, loop statements, Nested control structures, exit statement
2.3 Math operators & formulas, logical operators, string functions, special functions available in VB like Input Box ( ), Message Box ( ) , Format ( ).
	02

Topic 3] Controls and Events
Specific Objectives:
  ➢ **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:
3.1 Basic controls: Text box, list Box , Combo Box , Scroll Bar, frame , Option button, checkbox, command button, OLE controls
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.
	02

Topic 4] Advance Controls & Events
Specific Objectives:
  ➢ **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**
Contents:
	03

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:
    ➢ **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:
    ➢ **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 referenceVB6	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:
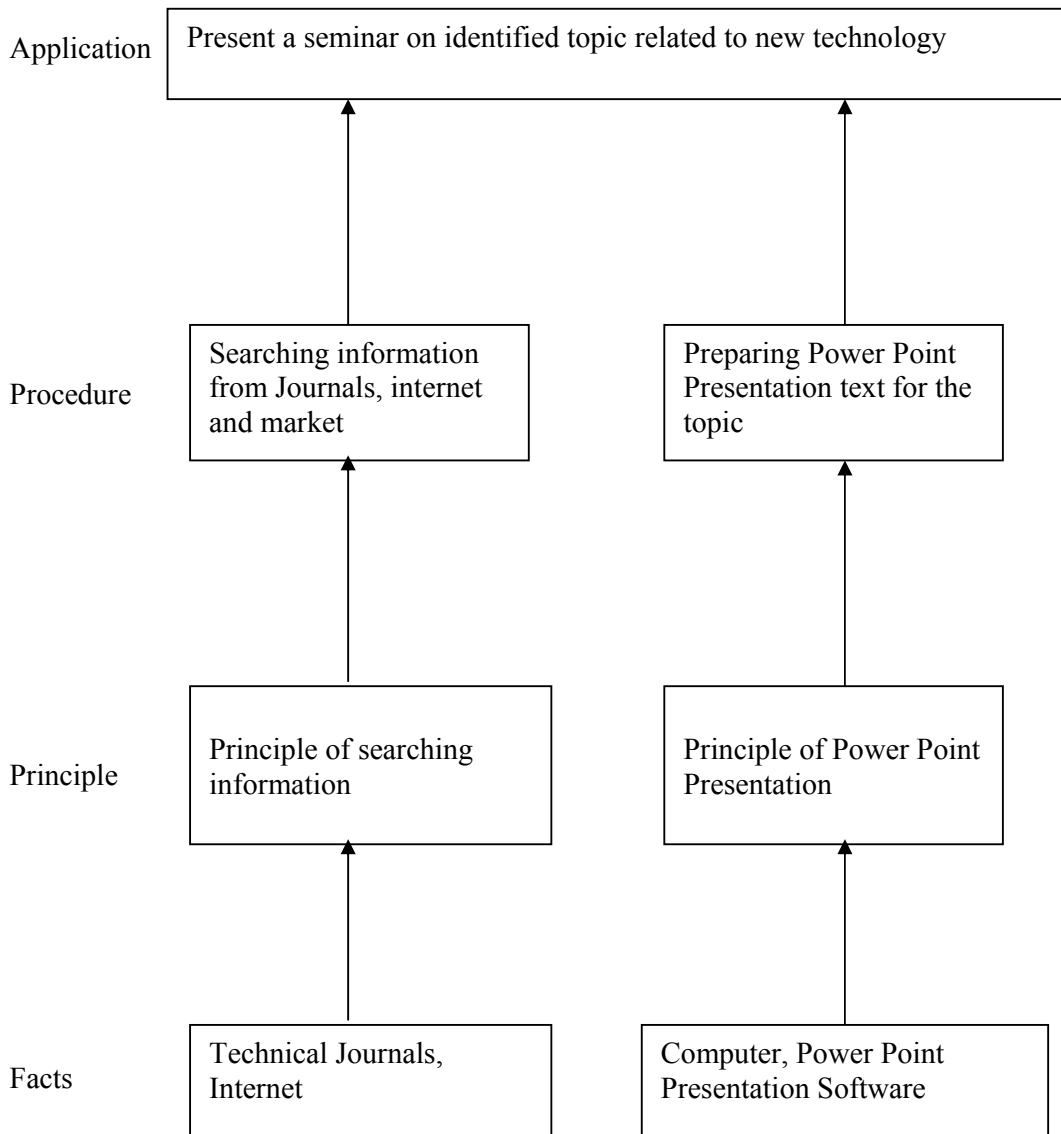
To develop the following skills:

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:

Application	Present a seminar on identified topic related to new technology

Procedure	Searching information from Journals, internet and market	Preparing Power Point Presentation text for the topic

Principle	Principle of searching information	Principle of Power Point Presentation

Facts	Technical Journals, Internet	Computer, Power Point Presentation Software

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.

- There 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 Profession Practices-III and marks will be given accordingly out of 50.