

PART — II
2nd Semester
FINAL DRAFT FOR
CURRICULAR STRUCTURE
AND SYLLABI OF
FULL-TIME DIPLOMA COURSES IN
ENGINEERING & TECHNOLOGY



WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION

(A Statutory Body under West Bengal Act XXI of 1995) “Kolkata Karigori Bhavan”, 2nd Floor, 110
S. N. Banerjee Road, Kolkata – 700013

Further suggestion may be submitted to the syllabus committee. List of the coordinators for the branch of Diploma in Electronics & Tele Communication Engineering are:

- | | |
|-------------------------|-------------------|
| ➤ Sri Sandip Kundu | Tele: 03322277590 |
| ➤ Dr. Bijita Biswas | Mobile:9830272981 |
| ➤ Dr. Marina Dan | Mobile:9831115387 |
| ➤ Dr. Susmita Sen | Mobile:9433772629 |
| ➤ Sri Anup Sarkar | Mobile:9433521132 |
| ➤ Sri Ashim Kumar Manna | Mobile:8902701784 |
- ashimmanna@rediffmail.com

WEST BENGAL STATE COUNCIL OF TECHNICAL EDUCATION												
TEACHING AND EXAMINATION SCHEME FOR DIPLOMA IN ENGINEERING COURSES												
COURSE NAME: FULL TIME DIPLOMA IN ELECTRONICS & TELECOMMUNICATION ENGINEERING												
DURATION OF COURSE: 6 SEMESTERS												
SEMESTER: FOURTH												
BRANCH: ELECTRONICS & TELECOMMUNICATION ENGINEERING												
SR. NO.	SUBJECT	CREDITS	PERIODS			EVALUATION SCHEME			ESE	PR	@TW	Total Marks
			L	TU	PR	INTERNAL SCHEME						
						TA	CT	Total				
1.	Communication Engineering -I	3	4	1	.-	10	20	30	70	-	-	100
2.	Analog Electronics –II	3	4	1	-	10	20	30	70	-	-	100
3.	Consumer Electronics	3	3	-	-	10	20	30	70	-	-	100
4.	Microprocessor	3	4	1	-	10	20	30	70	-	-	100
5.	Development of Life Skill-II	2	2	-	-	5	10	15	35	-	-	50
6.	Communication Engineering -I Laboratory	2	-	-	2	-	-	-	-	75	-	75
7.	Analog Electronics-II Laboratory	2	-	-	2	-	-	-	-	75	-	75
8.	Consumer Electronics Laboratory	2	-	-	2	-	-	-	-	75	-	75
9.	Microprocessor Lab	2	-	-	2	-	-	-	-	75	-	75
10.	Development of Life Skill-II Laboratory	1	-	-	1	-	-	-	-	50	-	50
11.	Professional Practice – II	2	1	-	3	-	-	-	-	-	50	50
	Total	25	18	3	12	45	90	135	315	350	50	850

STUDENT CONTACT HOURS PER WEEK:33 hrs, (Teaching-15 weeks + Internal Exam-2 weeks)

THEORY AND PRACTICAL PERIODS OF 60 MINUTES EACH

ABBREVIATIONS: L- Lecture, TU- Tutorials, PR- Practical, TA- Teachers Assessment, CT- Class Test, ESE- End Semester Exam, TW- Team Work

TA: Attendance & surprise quizzes = 6 marks, Assignment & group discussion = 4 marks.

Total Marks : 800

Minimum passing for Sessional marks is 40%, and for theory subject 40%.

Assessment of Practical, Oral & term work to be done as per the prevailing norms of curriculum implementation & assessment.

Name of the course: Communication Engineering –I	
Course Code: ETCE/CE1/S4	Semester: Fourth
Duration: One Semester (Teaching - 15 weeks + Internal Exam-2 weeks)	Maximum Marks: 100 Marks
Teaching Scheme:	Examination Scheme
Theory: 4 contact hrs./ week	Class Test (Internal Examination): 20 Marks
Tutorial: 1 contact hours / week	Teacher's Assessment (Attendance, Assignment & interaction): 10 Marks
Practical: 2 contact hours/ week	End Semester Examination: 70 Marks
Credit: 5 (Five)	Practical: 75 Marks
Rationale:	
<p>Communication plays vital role in our lives. Development in communication technology have increased its applications in allied fields of electronics including satellite, mobile, RADAR, telephony, telegraphy, industrial controls, etc. This course concentrates on the field of analog communication and pulse modulation including delta modulation. It also includes the advantages and disadvantages of digital and analog communications. After passing through the course the students will also be acquainted with the basic telephony and telecommunication switching.</p>	
Objectives:	
<p>The student will be able to:</p> <ul style="list-style-type: none"> • Classify different types of communication system. • Explain electromagnetic spectrum. • Know the basic requirements of an analog communication system; • Understand analog modulation including PAM, PWM and PPM; • Know the functioning of transmitter and receiver; • Explain the difference between digital and analog communication; • Discuss the ideas dealing with the operation of the systems like telephony. 	

Content (Name of topic)		Periods	Marks
Group-A			
Unit 1	Introduction To Electronic Communication	8	
	<p>1.1 Importance of communication, Elements of a communication system</p> <p>1.2 Types of electronic communication –Simplex, Half Duplex and Full Duplex , Electromagnetic spectrum (different bands and their frequencies , Bandwidth-concept of transmission bandwidth</p> <p>1.3 Basic idea of Fourier series and Fourier transform.</p>		
Unit 2	Analog Modulation	12	
	<p>2.1 Concept and necessity of modulation</p> <p>2.2 Definition of amplitude, frequency and phase modulation</p> <p>2.3 Derivation of sidebands in AM systems – Evaluation of power – Sideband depth –Efficiency of modulation, Percentage of modulation, Representation of</p>		

	<p>AM signal in time and frequency domain.</p> <p>2.4 METHODS OF AM: Principles of operation of plate modulated Class C amplifier – Balanced modulator, Ring modulator</p> <p>2.5 Expression of sidebands in FM and PM systems and its interpretation – Modulation index and bandwidth requirement, Representation of FM signal in time and frequency domain.</p> <p>2.6 Principles of operation of frequency modulation using Varactor diode and VCO.</p> <p>2.7 Comparison of AM, FM and PM</p> <p>2.8 Pulse modulation: Introduction, comparison with Continuous Wave Modulation, advantages, Sampling theorem, Nyquist rate, aliasing, natural & flat top sampling</p> <p>2.9 Concept of Pulse Amplitude Modulation (PAM), Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM) – Principle of generation and reception of PAM, PWM & PPM with block diagram and their applications</p>		
Group-B			
Unit 3	Transmitting Systems	4	
	<p>3.1 Block diagram and function of different stages of AM and FM broadcast transmitter</p> <p>3.2 WORKING PRINCIPLES OF SSB SYSTEMS WITH BLOCK DIAGRAM: Filter Method – Phase Shift Method</p>		
Unit 4	Demodulation	6	
	<p>4.1 Principle of detection with diode detector</p> <p>4.2 AGC circuit delayed AGC</p> <p>4.3 Foster-Seeley discriminator – Ratio Detector – Limiter – Standard AFC Circuits (basic principles only, no derivation)</p> <p>4.4 PLL (block diagram & operation) explanation.</p>		
Unit 5	Receiving System	8	
	<p>5.1 Principle of heterodyne, Characteristics of AM radio receiver- Sensitivity, Selectivity, and Fidelity</p> <p>5.2 Block diagram and principle of operation of super heterodyne receiver – IF amplifier and choice of IF – Mixer and converter – Alignment and tracking – Tone and volume control – Band spreading – Receiver characteristics & Testing – sensitivity, selectivity and fidelity</p> <p>5.3 Block diagram and principle operation of FM receiver – Pre-emphasis and de-emphasis – AFC and alignment of FM receiver</p>		
Group-C			
Unit 6	Basic Telephony	12	
	6.1 Telephone transmitter – Receiver – Dial tone, side tone and antisidetone circuits –		

	Handset – Ringer – Switch hook – Hybrid – Local loop – Tone dialling – DTMF 6.2 Electronic Exchange: Space division switching, time division switching, block diagram of electronic exchange , 6.3 Discuss the numbering plan of telephone networks (National Schemes & International Numbering) 6.4 Describe the operation of EPABX.		
Unit 7	Pulse Code Modulation	6	
	7.1 Idea of digital communication – Advantages of digital communication over analog communication 7.2 BASIC STEPS IN PCM SYSTEM: Filtering – Sampling – Quantizing – Encoding – Line coding (HDB3, AM1, CM1, NRZ, RZ) 7.3 Block schematic description of transmitter and receiver of PCM system 7.4 Principles of linear and non-linear quantization – Companding, Inter Symbol Interference		
Unit 8	DELTA MODULATION	4	
	8.1 Block schematic description of delta modulation technique 8.2 Limitations of delta modulation – Slope overload and granular noise. 8.3 Concept of adaptive delta modulation technique		
	TOTAL	60	

Contents Practical

Skills to be developed: On satisfactory completion of the course, the students should be in a position to design few fundamental networks.

Intellectual Skills:

1. Selection of appropriate sample
2. Selection of Equipment
3. Interpretation of waveforms

Motor Skill:

1. Accurate observation
2. Setting up of Equipment
3. Measurement

List of Practical: Any EIGHT(including MINI PROJECT)

Suggested List of Laboratory Experiments

Sl. No.	
1.	To study the amplitude modulation and demodulation technique.
2.	To study the frequency spectrum of AM and FM with the help of spectrum analyzer.
3.	To study the analog signal sampling and reconstruction of the effect of: — (a) different sampling frequencies on reconstructed signals; (b) Varying duty cycle of sampling frequency on the amplitude of reconstructed signal.
4.	Observe waveforms of Pulse code modulation and demodulation.
5.	Observe waveforms of Delta modulation.
6.	Observe waveforms of Adaptive delta Modulation

3.	Wayne Tomasi	Electronic communication system	Pearsons Education
4.	B.P. Lathi	Analog and Digital communication	OXFORD
5.	Sanjay Sharma	Analog and digital Communication	S.K. Kataria
6.	Simon Heykin	Communication system	Wiley
7.	John C Bellamy	Digital telephony	Wiley India
8.	Anokh Singh	Communication engineering	Dhanpat Rai & Sons
9.		Electronic Communication	Prentice Hall of India, N. Delhi
10.	Kennedy	Electronic Communication System	Tata McGraw-Hill
11.	Taub & schilling	Analog and digital communication	Tata McGraw-Hill
12.	Frenzel	Communication Electronics	Tata McGraw-Hill
13.	K.Rekha	Digital Communication	SCITECH
14.	K. Sam. & Shanmugar	Digital & Analog Communication	Wiley

EXAMINATION SCHEME (SESSIONAL)

Name of Subject: Communication Engg.-I Laboratory

Full Marks-75

Subject Code: ETCE/LCE1/S4

1.Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Third Semester. **Distribution of marks: Performance of Job – 15, Notebook – 10.**

2.External Assessment of 50 marks shall be held at the end of the Third Semester on the entire syllabus. One experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 15.**

Name of the course: Analog Electronics-II	
Course Code: ETCE/AE11/S4	Semester: Fourth
Duration: One Semester (Teaching - 15 weeks + Internal Exam-2 weeks)	Maximum Marks: 100 Marks
Teaching Scheme:	Examination Scheme
Theory: 4 contact hrs./ week	Class Test (Internal Examination): 20 Marks
Tutorial: 1 contact hours / week	Teacher's Assessment (Attendance, Assignment & interaction): 10 Marks
Practical: 2 contact hours/ week	End Semester Examination: 70 Marks
Credit: 5 (Five)	Practical: 75 Marks
Rationale:	
The physical world is inherently analog.	
Objectives:	
<p>The student will be able to</p> <ol style="list-style-type: none"> 1. describe an operational amplifier, 2. explain how its operation in a circuit depends on certain parameters, 3. recognize various op-amp circuit and its applications, 	

4. be familiar with microelectronic technology,
5. observe, measure and record various types of waveforms through the use of applicable measuring instruments and perform essential tests, diagnosis & repairs.

Content (Name of topic)		Periods	Marks
Group-A			
Unit 1	Tuned Amplifier		
	1.1 Circuit operation of single tuned, double tuned and stagger tuned amplifiers	4	
Unit 2	Feedback Amplifier	7	
	2.1 Basic idea of positive and negative feedback – Effect of negative feedback on gain, gain stability, distortion, noise, bandwidth, phase shift, input and output impedances		
	2.2 Voltage and current, series and shunt feedback		
	2.3 Performance of emitter follower circuit – Calculation of gain and input & output impedances – Darlington pair		
Unit 3	Operational Amplifier	16	
	3.1 Circuit operation of differential amplifier – single & double ended		
	3.2 INTRODUCTION TO OPERATIONAL AMPLIFIER: Inverting and non-inverting mode and their gain calculation – Common mode rejection ratio – Bias current – Offset voltage and current – Slew rate – Open loop and closed loop gain – Input and output impedance – Frequency response and virtual ground		
	3.3 APPLICATIONS OF OPAMP: Adder – Subtractor – Voltage Follower – Integrator – Differentiator – Comparator – Schmitt Trigger – Voltage Limiter – Log Amplifier – Clipper – Clamper		
	3.4 Concept of Active Filter		
Group B			
Unit 4	Oscillator	8	
	4.1 Concept of oscillation – Barkhausen criteria		
	4.2 Operation of following oscillators: — a) tuned collector, b) Hartley, c) Colpitt, d) Wein-bridge, e) Phase Shift, and, f) Crystal.		
Unit 5	Relaxation Oscillator	6	
	5.1 Operation of monostable, astable and bistable multivibrator with waveforms		
	5.2 Schmitt trigger circuits		
	5.3 IC-555, internal block diagram and pin function, construction of different multivibrators with IC-555		
Group-C			
Unit 6	Sweep Circuits	6	
	6.1 Fundamentals of sweep circuit operation – Difference between voltage time base generator and current time base generator		
	6.2 Operation of Miller and Bootstrap circuits – Applications of Sweep Circuits.		

Unit 7	Microelectronics Technology	13	
	7.1 Advantages of ICs over discrete elements 7.2 TYPES OF ICs: Linear and Digital – Monolithic and Hybrid 7.3 PLANAR TECHNOLOGY: Crystal growth of wafer – Epitaxial growth – Oxidation – Photolithography – Chemical etching – Diffusion – Ion implantation and metallisation (ideas only) 7.4 Fabrication of BJT, diode, resistor and capacitor (salient features), Fabrication of NMOS, PMOS & CMOS		
	TOTAL	60	

Contents Practical

Skills to be developed: On satisfactory completion of the course, the students should be in a position to design few fundamental networks.

Intellectual Skills:

1. Interpret the results
2. Verify the tables

List of Practical: Any EIGHT(including MINI PROJECT)

Suggested List of Laboratory Experiments

Sl. No.	
1.	To determine the frequency response characteristics of a tuned amplifier.
2.	To determine the frequency characteristics of a negative feedback amplifier and compare with that of an amplifier without feedback.
3.	To study the waveforms and measure the frequency of : — a) Wien bridge, b) Hartley, c) Colpitt, d) tuned collector, e) RC phase shift, and, f) crystal oscillator circuit.
4.	To study the waveform of UJT as relaxation oscillator.
5.	To study the characteristics of IC555 timer connected as: a) astable multivibrator, b) monostable multivibrator.
6.	To observe the waveform at the input and output of clipping circuits in different clipping configuration.
7.	To study the operation of positive and negative clamper circuit.
8.	To study the characteristic parameters of differential amplifier in single ended and double ended versions: — a) input impedance, b) common mode voltage gain, c) differential mode voltage gain, d) CMRR.
9.	To determine the following characteristics of op-amp: — a) input offset voltage, b) slew rate, c) non-inverting gain, d) inverting gain.
10.	To study the following applications of op-amp using IC741: — a) adder, b) subtractor, c) differentiator, d) integrator, and, e) voltage follower

Examination scheme (Theoretical):

- A). Internal Examination: Marks- 20
 B). End Semester Examination: Marks-70

- C) Teacher's **Assessment: Marks- 10**
 (i) Marks on Attendance: Marks-05
 (ii) Assignments & Interaction: Marks- 05

Group	Unit	Objective questions Note: 10 multiple choice and 5 short answer type questions			Total Marks
		To be set Multiple Choice (Twelve questions)	To be answered	Marks per question	
A	1,2,3	4	Any ten	1	10 X 1 = 10
B	4,5	4			
C	6,7	4			
		To be set short answer type (Ten questions)	To be answered	Marks per question	
A	1,2,3	3	Any five	2	5x2=10
B	4,5	3			
C	6,7	4			

Group	Unit	Subjective Questions			Total Marks
		To be set (Ten questions)	To be answered	Marks per question	
A	1,2,3	3	Any five (Taking at least one from each group)	10	10 X 5 = 50
B	4,5	3			
C	6,7	4			

Note 1 : Teacher's assessment will be based on performance on given assignments & quizzes.

Note 2 : Assignments may be given on all the topics covered on the syllabus.

Sl. No.	Name of the Author	Title of the Book	Name of the Publisher
1.	Boylestad & Nashalsky	Electronic Devices and Circuits	Pearsons Eduction
2.	David A. Bell	Electronic Devices and Circuits	Oxford University Press
3.	Anil K. Maini	Electronics Devices and circuits	Wiley
4.	Chattopadhyay & Rakhshit	Basic Electronic & Linear Circuits	New Age International
5.	Ramesh Babu	Electronic Devices & Circuits	Scitech
6.	Shredhra Smith	Microelectronics	Oxford University Press
7.	Sanjay Sharma	Electronics Devices and circuits	S K Kataria and sons
8.	J B Gupta	Electronics Devices and circuits	S K Kataria and sons
9.	S. Salivanan	Electronic Devices and Circuits	Tata McGraw-Hill
10.	Malvino	Electronic Principles	Tata McGraw-Hill
11.	Milman & Halkias	Integrated Electronics	Tata McGraw-Hill
12.	Gayakwad	OP Amp and Linear Integrated Circuits	Prentice Hall of India, N. Delhi
13.	Ganesh Babu	Linear Integrated Circuits	SCITECH
14.	Mottershed	Electronic Devices and Circuits	Prentice Hall of India, N. Delhi
15.	Bhargava	Basic Electronic & Linear Circuits	Tata McGraw-Hill
16.	Sahadeb	Electronic Principle	Dhanpat Rai & Sons
17.	Rashid	Microelectronics	Wiley
18.	M.L. Anand	Electronics Devices and Circuits	S.K. Kataria and sons

19.	Dr. T. Thygrajan	Basic Electronics	SCITECH
20.	Subhadeep Chowdhury	Fundamentals of Electronics	Paragon Publisher
21.	Prem Singh Jakhar	Basic Electronics	Dhanpat Rai Publishing Co
22.	Maitreyi Ray Kanjilal	Analog Electronics Circuits	JBBL

E X A M I N A T I O N S C H E M E (SESSIONAL)

Name of Subject: Analog Electronics-II Laboratory

Full Marks-75

Subject Code: ETCE/ LAEII/ S4

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Third Semester. **Distribution of marks: Performance of Job – 15, Notebook – 10.**

2. External Assessment of 50 marks shall be held at the end of the Third Semester on the entire syllabus. One experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 15.**

Name of the course: Consumer Electronics	
Course Code: ETCE/ CONSUMER/ S4	Semester: Fourth
Duration: One Semester (Teaching - 15 weeks + Internal Exam-2 weeks)	Maximum Marks: 100 Marks
Teaching Scheme:	Examination Scheme
Theory: 3 contact hrs./ week	Class Test (Internal Examination): 20 Marks
Tutorial:	Teacher's Assessment (Attendance, Assignment & interaction): 10 Marks
Practical: 2 contact hours/ week	End Semester Examination: 70 Marks
Credit: 5 (Five)	Practical: 75 Marks
Rationale:	
<p>This course is designed to provide required knowledge and skills in the communication systems such as microphone and loudspeakers. Revolution in electronics technology has brought radical changes in Audio & Video system in the recent years and the state of art will enable the students to comprehend, the fact, concept, working principle and its application. The knowledge so gathered by the students will help them to be familiar with designing concepts and repairing of audio & video system.</p> <p>The low cost video system VCR, cameras have brought about video revolution in the field of home entertainment, education, training, advertising and electronic newsgathering. Dramatic developments in flat panel display, reduction in the cost of image scanning system, LCD display and integrated subsystems is going to affect our communication capabilities and life-style in a big way.</p>	
Objectives:	
<p>The student will be able to:</p> <ul style="list-style-type: none"> Understand the basic concept dealing with the operations of microphone, loudspeakers and Stereo phonic system; Understand the basic concepts dealing with the operation of B/W TV circuits, Colour TV circuits, CD player mechanism & fault finding in CD player with advance technique MP3 player & DVD unit. This will also touch the advance topic of the plasma LCD Television system & flat panel display. Learn the comparison of NTSC, PAL, and SECAM system. 	

<ul style="list-style-type: none"> Understand the principle of DTH, and HDTV. Discuss the principle of CCD & remote control. 			
Content (Name of topic)		Periods	Marks
Group-A			
Unit 1	Microphone	5	
	1.1 Discuss the characteristics of Microphones (Sensitivity, Frequency Response, Output Impedance, Distortion, Directivity) 1.2 Discuss the Principle of operation, construction, of Advantages and disadvantages of Carbon Microphone — Capacitance Microphone — Moving Coil Microphone - Wireless Microphone.		
Unit 2	Loud Speaker	6	
	2.1 Constructions and working principles of Moving Coil Loudspeaker – Impedance and Power Level of loudspeaker 2.2 Frequency response of Practical Loudspeakers: Woofer, Tweeter, Squawker – Loudspeaker Enclosure		
Unit 3	Stereos	5	
	3.1 Explain the concept of monophonic & stereo phonic sound system. 3.2 DETAILS OF STEREO COMPONENTS: Tone control, Bass, Treble, Balance & Control – Crossover Networks – Graphic Equalizer – Noise Reduction Techniques		
Unit 4	Advanced Sound Systems	6	
	4.1 Basic principles of Magnetic Recording, Playback. 4.2 Basic principles of digital recording & block diagram of MP3 player & Explanation.		
Group-B			
Unit 5	Black and White TV System	10	
	5.1.State and explain the following terms. 5.1.1 Aspect ratio. 5.1.2 Flicker. 5.1.3 Resolution. 5.1.4 Video bandwidth. 5.1.5 Interlaced scanning. 5.1.6 Composite video signal, discuss horizontal & vertical sync. 5.2 Working principle with block diagram of TV transmitter and receiver 5.3 Brief description with circuit diagram: TV Tuner – Video IF stage – Sound stage – Picture tube & its associated circuit – Synchronizing circuits – Automatic Gain Control (AGC) – Horizontal & vertical deflection circuits – EHT section – Remote control of a TV receiver 5.4 Television broadcast standards, Describe principle of operation of CCD cameras.		
Unit 6	Colour TV System	16	
	6.1 Fundamental concepts of RGB colour systems and RGB drivers of a colour		

	<p>picture tube, Distinguish between additive and subtractive mixing of colours.</p> <p>6.2 Explain complementary colours, hue, saturation, and Colour circle.</p> <p>6.3 Explain compatibility in TV system.</p> <p>6.4 Different colour systems like NTSC, SECAM and PAL system and their comparison</p> <p>6.5 Working principle of Vidicon camera, Block schematic description of a colour TV Transmitter and Receiver, explain working principle of PAL encoder and decoder, discuss Colour picture tube & its associated circuits.</p> <p>6.6 Discuss the colour TV signals (Luminance Signal & Chrominance Signal, (I & Q, U & V Signals), bandwidth of Chrominance Signal, colour subcarrier frequency & colour burst.</p> <p>6.7 Discuss the principle of operation of Shadow mask and Trinitron picture tube.</p> <p>6.8 Explain the De-gaussing circuit in Colour TV receiver</p> <p>6.9 Basic concept on Flat panel Display, Plasma Display, LCD display, LED display</p>		
	Group- C		
Unit 7	CD Player	4	
	<p>7.1 Working principle of CD recording and CD playing – Explain</p> <p>7.2 Block diagram and working principle of VCD and DVD Player</p>		
Unit 8	Principle of Cable, Satellite and HDTV System	8	
	<p>6.1 Modern cable TV system block diagram - Head end processor - Trunk & cable distribution system with block diagram – scrambling – descrambling</p> <p>6.2 State the need for satellite for TV broadcasting over wide area.</p> <p>6.3 Concepts of HDTV system, List HDTV standards.</p> <p>6.4 Explain TV Remote control transmitter and Receiver with block diagram.</p> <p>6.5 Direct to Home System (DTH) Introduction & Block Diagram. Concept of set top box</p> <p>6.6 Block diagram of dB meter with working principle.</p>		
	TOTAL	60	
<p style="text-align: center;">Contents Practical</p> <p>Skills to be developed: On satisfactory completion of the course, the students should be in a position to design few fundamental networks.</p> <p>Intellectual Skills:</p> <ol style="list-style-type: none"> 1. Reading 2. Sourcing of Websites <p>Motor Skill:</p> <ol style="list-style-type: none"> 4. Testing 5. Measurement 6. Detection of faults and remedial measures <p style="text-align: center;">List of Practical: Any EIGHT(including MINI PROJECT)</p>			

Suggested List of Laboratory Experiments	
Sl. No.	
1.	To study the internal layout of black and white TV receiver.
2.	To study the Internal adjustment, control and fault finding procedure of Black & White TV.
3.	To study the internal layout of colour television
4.	To study the internal adjustments control and simple troubleshooting techniques of Colour TV.
5.	Fault finding in given Colour TV : i) No color ii) Red Colour only iii) Blue color only iv) Green color only. v) Magenta color only vi) Cyan only vii) Yellow only viii) No raster, No Sound.
6.	Fault finding in given Colour TV : i) In HSYNC section ii) In VSYNC section iii) In SYNC separator
7.	Installation of DTH System
8.	Estimate the cost, layout of Cable TV.
9.	Collect information about Set Top box used for Cable TV at home

Examination scheme (Theoretical):

A). Internal Examination: Marks- 20

C) **Teacher's Assessment: Marks- 10**

B). End Semester Examination: Marks-70

(i) Marks on Attendance: Marks-05

(ii) Assignments & Interaction: Marks- 05

Group	Unit	Objective questions			Total Marks
Note: 10 multiple choice and 5 short answer type questions					
		To be set Multiple Choice (Twelve questions)	To be answered	Marks per question	
A	1,2,3,4	4	Any ten	1	10 X 1 = 10
B	5,6	5			
C	7,8	3			
		To be set short answer type (Ten questions)	To be answered	Marks per question	
A	1,2	3	Any five	2	5x2=10
B	3,4,5	4			
C	6,7,8	3			

Group	Unit	Subjective Questions			Total Marks
		To be set (Ten questions)	To be answered	Marks per question	
A	1,2	3	Any five (Taking at least one from each group)	10	10 X 5 = 50
B	3,4,5	4			
C	6,7,8	3			

Note 1 : Teacher's assessment will be based on performance on given assignments & quizzes.

Note 2 : Assignments may be given on all the topics covered on the syllabus.

Sl. No.	Name of the Author	Title of the Book	Name of the Publisher
15.	A.K. Maini	Colour Television and Video Technology	Wiley
16.	B.R.Gupta,	Consumer Electronics	Sk Kataria & Sons.
17.	Ajay Sharma	Audio and Video systems	Dhanpat Ray & Sons
18.	R.G. Gupta	Audio and Video Systems	Tata McGraw-Hill
19.	Gulati	Monochrome and colour TV	New Age International
20.	Newness	Book View	BPB
21.	Manohar Lotia	Modern CD Player Servicing Manual	BPB Publication
22.	Bartlett	Cable TV Technology and Operation	Tata MCGraw-Hill
23.	R.G. Gupta	Electronic Instruments and Systems	Tata MCGraw-Hill
24.	A.M.Dhake	Television & Video Engineering	Tata McGraw-Hill
25.	Chandrasekhar	Electronics Communication	OXFORD
26.	Bernard Grob	Basic Television and Video System	Tata McGraw-Hill
27.	S. Sharma	Basic Radio and Television	Tata McGraw-Hill
28.	R.R Gulati	Colour Television Principles and Praticce	New age International

E X A M I N A T I O N S C H E M E (SESSIONAL)

Name of Subject: Consumer Electronics Laboratory

Full Marks-75

Subject Code: ETCE/LCONSUMER/S4

1. Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Third Semester. **Distribution of marks: Performance of Job – 15, Notebook – 10.**

2.External Assessment of 50 marks shall be held at the end of the Third Semester on the entire syllabus. One experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 15.**

Name of the course: Microprocessor	
Course Code: ETCE/ MP /S4	Semester: Fourth
Duration: One Semester (Teaching - 15 weeks + Internal Exam-2 weeks)	Maximum Marks: 100 Marks
Teaching Scheme:	Examination Scheme
Theory: 3 contact hrs./ week	Class Test (Internal Examination): 20 Marks
Tutorial: 1 contact hrs./ week	Teacher's Assessment (Attendance, Assignment & interaction): 10 Marks
Practical: 2 contact hours/ week	End Semester Examination: 70 Marks
Credit: 5 (Five)	Practical: 75 Marks
Rationale:	
This course is designed to introduce the student to the field of microprocessor and microcomputers. Topics covered include organization of a computer, the architecture of typical 8 bit and 16 bits microprocessors, its function and its instruction set. Machine language of the 8085 and 8086 microprocessors is covered in details and the students are given the opportunity of writing programs and controlling devices using an 8085 and 8086 based system development kit	

Objectives:			
<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. identify the main function and application of microprocessor and microcomputers; 2. describe the basic organization of a computer; 3. describe the architecture of 8 bit microprocessor; 4. write machine language program for an 8085 based microcomputer; 5. describe memory and I/O interfacing technique; 6. describe I/O interfacing scheme and devices; 7. program I/O interface devices; 8. describe the architecture and instruction set of 8086 and write program. 9. Understand the concept of advance microprocessor 			
Content (Name of topic)		Periods	Marks
Group-A			
Unit 1	Introduction to Microprocessor and 8 BIT Microprocessor	7	
	1.1 Distinguish between microprocessor & microcomputer, Generation and evaluation of microprocessor 1.2 Tristate register and switch 1.3 Architecture of intel-8085- registers, timing and control, add buffer and add data, interrupts control, serial input and output control 1.4 Concept of Bus, bus organization of 8085 1.5 Pin details of 8085 and related signals 1.6 Demultiplexing of address and data bus by ALE signal.		
Unit 2	Timing Cycle of 8085	5	
	2.1 Machine cycle, instruction cycle 2.2 Instruction fetch cycle, read cycle and write cycle 2.3 Bus idle cycle, Hold and Halt state 2.4 Timing diagram of opcode fetch cycle or memory read cycle, Memory write, I/O read and I/O write cycle, MVI A, 8 bit data; LXI rp, 16 bit data; STA, 16 bit address.		
Unit 3	Programming of 8085	8	
	3.1 Addressing modes of 8085A 3.2 Classification of instruction and Instruction set of 8085A 3.3 Concept of assembly language programming- basic assembler directives and labels 3.4 Instruction Format (one byte, two byte and three byte instruction), opcode format 3.5 Different operations of 8085 with respect to the status of IO/M, S ₁ , S ₀ , RD, WR signals. Instructions related with interrupt. 3.6 Concept of stack, subroutine and interrupts. 3.7 Hardware and software interrupts, maskable and non-maskable interrupts, vectored interrupts, Enabling, disabling and masking of interrupts		

	3.8 Hardware structure of the interrupts of 8085		
Group-B			
Unit 4	Memory Interfacing & I/O Interfacing	6	
	4.1 Basic bus interface 4.2 Address decoding 4.3 Interfacing ROM, static RAM and dynamic RAM- Simple example of memory interfacing (RAM /ROM) with microprocessor. 4.4 Address space provided by 8085A 4.5 Interfacing I/O devices 4.6 Comparison of I/O mapped I/O & memory mapped I/O system		
Unit 5	I/O Data Transfer scheme	6	
	5.1 Synchronous and asynchronous data transfer 5.2 Explain functional block diagram 8251 and interfacing with microprocessor 5.3 Interrupt driven data transfer, single interrupt, multiple interrupt- polling, priority interrupt controller, dairy chaining 5.4 Direct memory access – Block transfer DMA – Cycle stealing DMA		
Unit 6	I/O Interfacing Devices	8	
	6.1 Functional block diagram and programming of : — a) 8253(programmable counter), b) 8255(PPI), c) 8279(Keyboard and display controller) 6.2 Functional block description and control word development of :— a)8257(programmable DMA controller), b) 8259 (programmable interrupt controller) 6.3 Interfacing DAC & ADC with 8085 Group C		
Unit 7	Introduction to 8086 and instruction set	14	
	7.1 Functional Block Diagram of 8086: Bus interface unit, execution unit, general purpose register, flag register, pointer and index register 7.2 Memory address space and generating a memory address 7.3 Dynamically allocable relocatable code 7.4 Dedicated and reserved memory location 7.5 Pin configuration of 8086- minimum and maximum mode 7.6 Addressing mode of 8086, interrupts of 8086 and interrupt vector table 7.7 Instruction set of 8086 7.8 Internal block diagram of 8088 7.9 Comparison between 8086 and 8088 7.10 Interfacing system clock Generator 8284. 7.11 Interfacing bus controller 8288. 7.12 Floating point process of 8087 and its interfacing. 7.13 Discuss instruction set-Data transfer-Arithmetic and logical branching- loop control.& String – processor control instruction		
8	Advance Microprocessor	6	

	8.1 Concept of virtual and cache memory. 8.2 Memory management schemes 8.3 MULTI-TASKING & MULTI-USER OPERATING SYSTEM: Prescribing the environment – Accessing resources – Need for protection. 8.4 80286: Architecture – Real address mode – Protected virtual address mode. 8.5 80386: Comparison of 80386 with 80286. 8.6 Concept of super scalar and dual pipeline architecture		
	TOTAL	60	
Contents Practical			
Skills to be developed: On satisfactory completion of the course, the students should be in a position to design few fundamental networks.			
Intellectual Skills:			
<ul style="list-style-type: none">• Use of programming language constructs in program implementation.• To be able to apply different logics to solve given problem.• To be able to write program• Study different types of errors as syntax semantic, fatal, linker & logical• Debugging of programs• Understanding different steps to develop program such as<ul style="list-style-type: none">➤ Problem definition➤ Analysis➤ Design of logic➤ Coding➤ Testing➤ Maintenance (Modifications, error corrections, making changes etc.)			
Motor Skill:			
Proper handling of Computer System.			
List of Practical: Any EIGHT(including MINI PROJECT)			
Suggested List of Laboratory Experiments			
Sl. No.	a. Write assembly language programs for 8085:		
1.	for addition and subtraction of two 8 bit & 16 bit numbers.		
2.	to transfer data bytes from memory block to another memory block		
3.	to multiply two 8 bit numbers using add and shift techniques		
4.	to find the biggest number in the given array		
5.	to arrange the given bytes in ascending & descending order using bubble sort.		
6.	to find one's and two's complement of a given number.		
7.	to find LCM for the given data		
8.	to exchange the lower & upper nibble of a byte.		
9.	to sort odd and even byte from given 10 bytes.		
	b. To practice simple assembly language program of 8086 using PC and trainer kit.		
	Mini Project		
	Design a stepper motor interface card using driver IC.		
	Design an interface A/D converter using 8085 microprocessor.		
	Interface D/A converter using 8085 microprocessor.		

Examination scheme (Theoretical):

A). Internal Examination: Marks- 20
B). End Semester Examination: Marks-70

C) **Teacher's Assessment: Marks- 10**
(i) Marks on Attendance: Marks-05
(ii) Assignments & Interaction: Marks- 05

Group	Unit	Objective questions			Total Marks
Note: 10 multiple choice and 5 short answer type questions					
		To be set Multiple Choice (Twelve questions)	To be answered	Marks per question	
A	1,2,3	4	Any ten	1	10 X 1 = 10
B	4,5,6	5			
C	7,8	3			
		To be set short answer type (Ten questions)	To be answered	Marks per question	
A	1,2,3	3	Any five	2	5x2=10
B	4,5, 6	4			
C	7,8	3			

Group	Unit	Subjective Questions			Total Marks
		To be set (Ten questions)	To be answered	Marks per question	
A	1,2,3	3	Any five (Taking at least one from each group)	10	10 X 5 = 50
B	4,5, 6	3			
C	7,8	4			

Note 1 : Teacher's assessment will be based on performance on given assignments & quizzes.

Note 2 : Assignments may be given on all the topics covered on the syllabus.

Sl. No.	Name of the Author	Title of the Book	Name of the Publisher
1	Senthil Kumar	Microprocessor & Microcontroller	OXFORD
2	Bizu Azzez	Microprocessor & Microcontroler	SCITECH
3	Krishna Kant	Microprocessor & Microcontroler	PHI
4	Berry Brey	Microprocessor	Pearson
5	B. RAM	Microprocessor 8085	New
6	Ramesh A. Gaonkar	Microprocessor Architecture programming & application with the 8085	Penfam International
7	James L. Antonakos	An introduction to the Intel family of Microprocessors	Pearson Education Asia
8	Naresh Grover	Microprocessor Comprehensive Study: Architecture, Programming & Interfacing	Dhanpat Rai & Co.
9	XXX	Microprocesor	S.K. Kataria & Sons
10	Douglas V-Hall	Microprocessor & interfacing (programming & hardware)	Tata McGraw Hill
11	A.K. Ray & K.M. Bhurchandi	Advanced microprocessor & peripheral	Tata McGraw Hill

12	Liu & Gibson	Microprocessor System: 8086/8088 Family	Prentice Hall of India
14	Subhasis maitra	Microprocessor and Microcontroller	JBBL
15	Berry B Brey	The Intel Microprocessor 8086, 8086286, 80386	PEARSON
15	B. RAM	Microprocessor 8085	TMH

E X A M I N A T I O N S C H E M E (SESSIONAL)

Name of Subject: Microprocessor Laboratory

Full Marks-75

Subject Code: ETCE/ LMP/S4

1.Continuous Internal Assessment of 25 marks is to be carried out by the teachers throughout the Third Semester. **Distribution of marks: Performance of Job – 15, Notebook – 10.**

2.External Assessment of 50 marks shall be held at the end of the Third Semester on the entire syllabus. One experiment per student from any one of the above is to be performed. Experiment is to be set by lottery system. **Distribution of marks: On spot job – 35, Viva-voce – 15.**

Name of the course: Professional Practice-II	
Course Code: ETCE/PP-II/S3	Semester: Third
Duration: 17 weeks (Teaching-15 weeks + Internal Exam-2 weeks)	Maximum Marks: 50
Teaching Scheme:	Examination Scheme :
Theory: 1	Internal Teachers' Assessment: 50 Marks
Tutorial:	
Practical: 3 contact hours/ week	End Semester Examination: Nil
Credit: 2	
Rationale:	
<p>In addition to the exposure both in theoretical and practical from an academic institution, it is desired that student should be familiar with the present day industry working environment and understand the emerging technologies used in these organisation. Due to globalization and competition in the industrial and service sectors, acquiring overall knowledge will give student an better opportunity for placement facility and best fit in their new working environment.</p> <p>In the process of selection, normal practice adopted is to see general confidence, positive attitude and ability to communicate, in addition to basic technological concepts.</p> <p>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.</p>	
Objectives:	
<p>The student will be able to-</p> <p>Student will be able to:</p> <ol style="list-style-type: none"> 1. Acquire information from different sources. 	

2. Enhance creative skills
3. Prepare notes for given topic.
4. Present given topic in a seminar.
5. Interact with peers to share thoughts.
6. Understand software for designing electronics circuits
7. Acquire knowledge of designing and maintenance of Electronics circuits, PCB and relevant software
8. Acquire knowledge on Open Source Software and its utility
9. Understand application of technologies in industry scenario.
10. Prepare a report on industrial visit, expert lecture.

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. The industrial visits may be arranged in the following areas/ industries : i) Electronic equipment manufacturing unit ii) Resistance Welding unit iii) Industrial automation unit iv) Adarsh Gram v) Shops using electronic billing system vi) Telephone Exchange	8
2	Lectures by Professional / Industrial Expert lectures to be organized from any of the following areas (topics at sl. No. ii and any 2 from rest): i) Cyber laws ii) Open source Software PHP & MySql PHP&MySQL Unit:1 Introduction and Installation Of PHP and Operators Unit:2 Arrays, Statements and functions in PHP Unit:3 MySQL Unit:4 Functions, Cookies and Sessions in PHP Unit: 5 Sending Email, User Login and Registratio iii) Fiber optics communication system iv) Nano Technology v) Use of signal for Telephone, television, internet vi) Industrial Safety vii) Ethical Hacking viii) Any other suitable topic	10
3	Information Search : Information search can be done through manufacturers, catalogue, internet, magazines; books etc. and submit a report. Following topics are suggested : i) Collection of information about tools used in electronic workshop ii) Market survey for motors used in electronic application iii) Non Conventional Energy Sources with focus on solar energy iv) Elevators installation and maintenance v) Any other suitable areas vi) Study of performance of various processors using “bench mark comparison” (Refer the website: www.cpubenchmark.net)	6
4	Seminar : Seminar topic should be related to the subjects of fourth semester or any other suitable topics from emerging areas of ETCE like the topics mentioned below . Each student shall submit a report of at least 10 pages and deliver a seminar (Presentation time – 10	

	minutes) i. Micorstrip Antenna ii. Semiconductor Microwave Devies iii. Cryptography iv. Bluetooth Technology	
5	Mini Project / Activities: a) Design of P.C.B. using software b) Web page Design using PHP & MySql c) Developing small unit of eliminator battery or D.C. power supply d) Study of networking in computer laboratories e) Comparative study of cables	07
Total		31

PHP&MySQL for Professional Practices courses

PHP is a general-purpose server-side scripting language originally designed for Web development to produce dynamic Web pages. It is one of the first developed server-side scripting languages to be embedded into an HTML source document, rather than calling an external file to process data. Ultimately, the code is interpreted by a Web server with a PHP processor module which generates the resulting Web page.

MySQL can be used for managing databases

PHP&MySQL can be useful in field of Information technology and Computer Science.

All the tutorials are useful in the above mentioned subjects.

<u>FOSS</u>	<u>Relevance</u>	
PHP&MySQL	Unit:6 Introduction and Installation Of PHP and Operators	
	Unit:7 Arrays, Statements and functions in PHP	
	Unit:8 MySQL	
	Unit:9 Functions, Cookies and Sessions in PHP	
	Unit:10 Sending Email, User Login and Registration	
	Total	

Notes:

We encourage students to go for workshops and tests. See link spoken-tutorial.org.

Assignments are provided for each topic. These should be solved when students revise for the test.

An individual has to go through the tutorials and practice the assignments given after each tutorial for better learning.

The timing specified in the duration column is the maximum time required by an individual to view and practice that particular tutorial.

Unit:1 Introduction and Installation Of PHP and Operators:

Sno.	Topic	
1	Installation Of PHP in the Linux Operating Systems	
2	Installation Of PHP in the Windows Operating Systems	
3	Getting Started with PHP <ul style="list-style-type: none"> • Echo Function • Variables 	
4	Operators <ul style="list-style-type: none"> • If Statement • Switch Statement • Arithmetic Operators • Comparison Operators • Logical Operators 	

Unit:2 Arrays, Statements and functions in PHP

Sno.	Topic				
1	Assignments to be solved on the above topics				
2	Arrays Arrays Multi-dimensional Arrays				
3	Statements <ul style="list-style-type: none">• While Statement• Do-While Statement• For Statement• For each Statement				
4	Functions <ul style="list-style-type: none">• Functions (Basic)• Functions (Advanced)• GET Variable• POST Variable				
5	Embedding PHP Common Way to Display HTML Common Errors <ul style="list-style-type: none">• Common Errors 1• Common Errors 2• Common Errors 3				

Unit:3 MySQL

Sno.	Topic				
1	MySql - I MySql - II MySql - III MySql - IV				
2	MySql - V MySql - VI MySql - VII MySql - VIII				

Unit: 4 Functions, Cookies and Sessions in PHP

Sno.	Topic				
1	Functions in PHP <ul style="list-style-type: none">• Simple Visitor Counter• String Functions 1• String Functions 2				
2	Cookies in PHP <ul style="list-style-type: none">• File Upload 1• File Upload 2• Cookies 1• Cookies 2				
3	Sessions in PHP <ul style="list-style-type: none">• Sessions• MD5 Encryption				

Unit: 5 Sending Email, User Login and Registration

Sr.no.	Topic				
1	How to Send Email in PHP <ul style="list-style-type: none">• Sending Email 1• Sending Email 2• Sending Email 3				
2	How to create User Login in PHP <ul style="list-style-type: none">• Display images from a Directory• User Login 1• User Login 2• User Login 3				
3	How to create Registration in PHP <ul style="list-style-type: none">• User Password Change 1• User Password Change 2• User Password Change 3• User Registration 1• User Registration 2• User Registration 3• User Registration 4• User Registration 5• User Registration 6				

Recommended Text Books:

It is alright to go ahead with teaching from the prescribed books as per the existing syllabus.

Text books can be referred from the link given below.

Text Books link for PHP :

<http://www.flipkart.com/beginning-php-mysql-novice-professional-4th/p/itm dyggzm6ygzccg?pid=9788184897456&ref=73b694e2-81dc-4d9f-b929>