

West Bengal State Council of Technical &
Vocational Education and Skill
Development
(Technical Education Division)



Reduced Draft Syllabus
of

Diploma in Electronics & Tele-
Communication Engineering

Part-III (6th Semester)

Only for Academic Session 2021 - 2022

Name of the course: Advance Communication Engineering				
Course Code: ETCE/ ACE /S6		Semester: Sixth		
Duration: One Semester		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: 3 contact hours/ week		End Semester Examination: 70 Marks		
Credit: 5 (Five)		Practical: 50 Marks		
Rationale:				
This course is continuation of the one titled " DIGITAL AND MICROWAVE COMMUNICATION ENGG ", offered in Part – III, 1st Semester. After completion of this course, the students will be able to get some idea about modern communication techniques like satellite communication, optical fibre communication, computer network spread spectrum modulation, modern telephony etc.				
Objectives:				
The student will be able to:				
<ol style="list-style-type: none"> 1. Describe satellite communication. 2. Get an overview of optical communication. 3. Develop computer network systems. 4. Explain working principle of modern telephony. 				
Content (Name of topic)			Periods	Marks
Unit 1	SATELLITE COMMUNICATION		7	
	a. Kepler's Law – Artificial Satellite – Orbits – Geostationary Orbit – b.. Satellite Speed – Power Systems – Satellite Angles – Station Keeping – Satellite Launching – Attitude Control. c. Transponder and satellite frequency allocations – Frequencies reuse. d. Block schematic description of communication satellite			
Unit 2	OPTICAL COMMUNICATION		8	
	a. Concept of fibre optic communication system – Advantages and limitations of optical fibre communication – Construction of optical fibre – b. Optical fibre types: Monomode and Multimode. c. OPTICAL FIBRE PERFORMANCE: Bandwidth-distance product – d. Transmission loss. e. OPTICAL SOURCES: LED and LASER – Modulation of LED and LASER – Functions of optical detectors.			

	f. Block schematic description of optical fibre communication system. g. Components of optical fibre – Coupler connector splice. h. Applications of fibre optics.		
Unit 3	SPREAD SPECTRUM MODULATION(ONLY DESCRIPTIVE TREATMENT)	6	
	a. Introduction, PN Sequence. b. Model of spread spectrum modulation system. c. Direct sequence spread spectrum signal. d. Frequency hop spread spectrum, slow frequency hopping, and fast frequency hopping.		
Unit 4	MODERN TELEPHONY	7	
	a. Working of facsimile or fax – Idea of image processing by Charged Coupled Device. b. CELLULAR TELEPHONE SYSTEM: Concept – Mobile Telephone Switching Office – Cellular telephone unit – Frequency synthesizer – Number Assignment Module – Mobile Identification Number – Digital cellular telephone system – Global System for Mobile communication – Concept of CDMA. c. Concept of 1G, 2G , 3G and 4G		
	TOTAL	28	

Name of the course: Instrumentation and Control			
Course Code: ETCE/ IC /S6		Semester: Sixth	
Duration: One Semester		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: 4 (Four)		Practical: 50 Marks	
Rationale:			
Measurement of different physical quantity can be done with the help of some instruments constructed of some electrical and electronic devices. The students will be familiar with the principle of operation of different transducer processing of signals of different instrument like LVDT, strain gauge, thermocouple, thermistors etc. The students will also be acquainted with the basics of control system after successful completion of this course.			
Objectives:			
The student will be able to:			
5. Learn transducer fundamentals.			
6. Get an overview of position, displacement, pressure or force and temperature measurement.			
7. Describe the closed loop systems and its stability.			
8. Learn about process controllers.			
Content (Name of topic)		Periods	Marks
Unit 1	TRANSDUCERS FUNDAMENTALS	2	

	a. Principle of operation of transducer and sensor – Classification of Transducers b. Factors for choice of transducer.		
Unit 2	POSITION, DISPLACEMENT, PRESSURE OR FORCE & VIBRATION MEASUREMENT	4	
	a. Principle of Potentiometric Transducer. b. Capacitance Transducer c. Linear Variable Differential Transformer d. Electrical strain gauges: Types – Gauge Factor – Temperature Specification, SEMICONDUCTOR STRAIN GAUGES. e. Properties of piezoelectric alignments.		
Unit 3	TEMPERATURE MEASUREMENT	3	
	a. Basic types of temperature transducer: Resistance detectors, Thermistors, Thermocouple — Principle of operation, specifications, features and applications.		
Unit 4	INTRODUCTION TO CONTROL ENGINEERING	6	
	a. Examples of control system. b. Classification of control system c. Representation of control system d. Transfer function. e. Block diagram of a feedback control system and its simplification (Block Diagram Algebra and Basic Idea).		
Unit 5	SYSTEM ELEMENT BEHAVIOUR	6	
	a. The steady state and transient response. b. Steady State Error – Rise Time – Delay Time – Settling Time c. DAMPING: Over damped – Under damped – Critically damped d. Standard test inputs - step, ramp, parabolic & impulse - corresponding Laplace representation. e. Poles & zeros – definition. f. Analysis of first order control system for unit step input; concept of time constant		
Unit 6	CLOSED LOOP SYSTEM	3	
	a. s-plane – Introduction to stability - stable, unstable, critically stable & conditionally stable system; relative stability (only position of poles and zeroes in the s-plane to be considered). b. Routh's stability criterion-- basic idea.		
Unit 7	CONTROL ACTIONS & PROCESS CONTROLLERS	4	
	a. Process control system – block diagram, elements. b. on off controllers: neutral zone c. proportional controllers, integral controllers & derivative controllers d. composite controllers; PI, PD, PID controllers.		
	TOTAL	28	

Name of the course: Industrial Electronics -II	
Course Code: ETCE/ IEII/S6	Semester: Sixth
Duration: One Semester	Maximum Marks: 100 Marks

Teaching Scheme:		Examination Scheme		
Theory: 3 contact hrs./ week		Class Test (Internal Examination): 20 Marks		
		Teacher's Assessment (Attendance, Assignment & interaction): 10 Marks		
Practical: 3 contact hours/ week		End Semester Examination: 70 Marks		
Credit: 5 (Five)		Practical: 50 Marks		
Rationale:				
<p>This subject is important link between basic electricity and advanced electronic applications. Industrial electronics shall play very important role for shop floor engineers in the field of industrial applications like conversion, inversion, and stabilization of ac & dc power control etc. Also, it will help engineer in the field of power generation, transformation and distribution in ac power. At the same time in the field of dc power requirement in industries, laboratories. This subject is heart of many industrial processes like battery charging, UPS, welding, time-controlled processes, temperature controller operation etc.</p>				
Objectives:				
<p>The student will be able to:</p> <ol style="list-style-type: none"> 1. Choose a device for a specific application. 2. Describe the operation of various converters, invertors, choppers and regulators 3. List applications of converters, invertors, choppers and regulators. 4. Select proper device for a given application. 				
		Content (Name of topic)	Periods	Marks
Unit 1	CHOPPERS		4	
	a. Principle of operation of chopper and its application. b. Jone's chopper and their areas of applications. c. Principle of operation of 4-quadrant chopper. d. Principle of operation of Cycloconverter and its applications.			
Unit 2	SPEED CONTROL OF DC MOTOR		4	
	a. TYPES OF SPEED CONTROL OF DC MOTOR: Armature Volt – Field Current Control. b. DRIVES SYSTEM: Controlled Rectifier Drive – Reversible Drive – Quadrant Drive. c. Dual Converter			
Unit 3	AC POWER REGULATOR		3	
	a. Concept of Automatic AC Regulator and phase control. b. Principle of operation of: Step Regulator – Solid State Changer (Synchronous Tap Changing). c. Principle of operation of Phase Control AC Regulator.			
Unit 4	SPEED CONTROL OF AC MOTOR		4	
	a. Types of speed variation – Frequency variation – Stator volt variation – Closed loop control – Types of feedback. b. Types of Breaking: Regenerative Breaking – Plugging.			
Unit 5	INVERTERS		4	
	a. Principle of operation of voltage driver, current driver, half bridge and full bridge inverter. b. Three phase Inverter 120° mode c. Applications of Inverter.			
Unit 6	UPS		2	

	a. Principle of operation of ON-line UPS, standby UPS, utility of static switch b. Use of storage devices and working principle of battery charger.		
Unit 7	STEPPER MOTOR	4	
	a. Types and principle of operation of stepper motor. b. STEPPER MOTOR CONTROL: Chopper Drive.		
	TOTAL	25	

Name of the course: Computer Network II				
Course Code: ETCE/ CNII/S6		Semester: Sixth		
Duration: One Semester		Maximum Marks: 50 Marks		
Teaching Scheme:		Examination Scheme		
Theory: 2 contact hrs./ week		Class Test (Internal Examination): 10 Marks		
		Teacher's Assessment (Attendance, Assignment & interaction): 5 Marks		
Practical: 2 contact hours/ week		End Semester Examination: 35 Marks		
Credit: 3 (Three)		Practical: 50 Marks		
Rationale:				
Modern age is the age of computer. Global communication can be done within few seconds with the help of computer network. Preliminaries like network structure, flow and error control, LAN, internetworking, network security etc. are included in this course so that the students know about the fundamentals of computer networking.				
Objectives:				
The student will be able to:				
<ol style="list-style-type: none"> 1. Distinguish between different protocols. 2. Describe and install TCP/IP protocols 3. Describe CSMA/CD and FDDI 4. Describe different types of Internet services like-VSAT, FTP, TELNET etc. 5. Learn Basic Programming concept of HTML. 6. Describe different aspects of Network Security and ENCRYPTION / DECRYPTION algorithm 				
Content (Name of topic)			Periods	Marks
Unit 1	TCP/IP Fundamentals		6	
	a. TCP/IP Protocols - ARP, IP, ICMP, TCP and UDP. b. IP Addressing - IP Address Assignments; IP Address Classes; Subnet Masking. c. TCP/IP Configuration - Installing the TCP/IP Protocol; Configuring TCP/IP. d. Configuring Basic TCP/IP Properties.			
Unit 2	LOCAL AREA NETWORK		4	
	a. ETHERNET: CSMA / CD – Frame formats b. Token Bus – Token Ring – Frame Formats c. FDDI: Access method – Frame format d. Wireless LAN			
Unit 3	Internet services		5	

	a. VSAT. b. Structure and Objectives of Intranet & Internet c. INTERNET SERVICES: Email – Telnet – FTP – World Wide Web (WWW) — Short Messaging Services (SMS) — VoIP – Basic Programming concept of HTML. d. ISDN – ATM.		
Unit 4	NETWORK SECURITY	5	
	a. Different aspects of SECURITY: Privacy – Authentication – Integrity – Non-Repudiation.. b. ENCRYPTION / DECRYPTION: Data Encryption System – Secret key method- Public key method. c. Digital signature		
	TOTAL	20	

Sessional syllabus will remain the same.