GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMUNICATION ENGINEERING

TEACHING SCHEME (revised Feb' 2012)

SEMESTER- VI

Subject Code	Subject	Teaching Scheme(Hours) For Teachers			Teaching Scheme For Students			Credits
		Theory	Tutorial	Practical	Theory	Tutorial	Practical	
2361101	Mobile Communication	3	0	2	3	0	2	**5**
2361102	VLSI Technology	4	0	4	4	0	4	**8**
2361103	Computer Networks	3	0	2	3	0	2	**5**
	Elective	4	0	2	4	0	2	**6**
2361108	Project-II	0	0	6	0	0	12(6+6)	**12**
	TOTAL	**14**	**0**	**16**	**14**	**0**	**22**	**36**

Select **ANY ONE** from the following subjects

Sr. No.	Sub. Code	Elective Subjects
1	**2361104**	Medical Electronics
2	**2361105**	Object Oriented Programming
3	**2361106**	Mechatronics
4	**2361107**	Consumer Electronics

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Mobile Communication
Subject Code: 2361101

Sr. No.	Subject Content	Total Hrs.
1	**CELLULAR TELEPHONE CONCEPT** 1.1 Evolution of Mobile Radio communication, , wireless communication standards 1.2 Cell Fundamentals : selection of structure, cluster, macro cell, microcell, Frequency Reuse, Co channel & Adjacent channel Interference 1.3 Cellular Services: Voice Services, Data Services, Multicast Services, Short Messaging Services, Multimedia Messaging service (MMS), Location Based Services (LBS) Channel assignment strategies	7
2	**GLOBAL SYSTEM FOR MOBILE** 2.1 Introduction 2.2 GSM system Architecture 2.3 GSM Radio subsystem and air interface specification 2.4 GSM Channel: brief introduction to traffic channels and control channels 2.5 Example of a GSM call ,Handoff strategies 2.6 Call procedures: mobile-to-landline call, mobile-to- mobile call and landline-to-mobile call 2.7 Frame structure for GSM 2.8 Signal processing in GSM , GSM Coder 2.9. Linear Modulation: Offset QPSK, _/4 QPSK 2.10 Constant envelope modulation: MSK, GMSK 2.11Device Addressing 2.11.1Mobile Station ISDN (MSISDN) 2.11.2International Mobile Subscriber Identity (IMSI) 2.11.3International Mobile Equipment Identifier (IMEI) 2.11.4emporary Mobile Station Identity (TMSI)	9

3	**CDMA TECHNOLOGY** 3.1 Introduction to spread spectrum technology 3.1.1 What is spread spectrum? 3.1.2 Criteria for spread spectrum system 3.1.3 Applications of the spread spectrum technique 3.2 Advantage of CDMA technology 3.3 Direct sequence system 3.3.1 Block diagram of direct sequence spread spectrum technique 3.3.2 Spreading codes: Walsh codes and PN codes 3.4 Basic concepts of Frequency Hoping system 3.5 Basic concepts of Time hoping system 3.6.Power Control in CDMA 3.6.1 Necessity of Power Control 3.6.2 Reverse Link Power Control 3.6.3 Forward Link Power Control 3.7 Handoffs in CDMA 3.8 Channel capacity 3.9 Call Processing in CDMA	9
4	**MOBILE HANDSET** 4.1 General Block diagram of cell phone 4.2 Block diagram of RF section 4.3 Block diagram of base-band section 4.4 Functions of CPU (DSP chip) and Microcontroller 4.5. SIM card and SIM card Interface 4.6 Charging control section 4.7 Different types of batteries 4.8 General faults and fault-finding procedure 4.9 Various Features of commercially available cell phone	10
5	**INTRODUCTION TO ADVANCED CONCEPTS** 5.1 GPRS 5.2 EDGE 5.3 Bluetooth 5.4 WCDMA 5.5 HSDPA 5.6 Smart Phone, I phone 5.7 Various operating System of Mobile 5.8 4^{th} Generation aspects 5.9 Smart Antenna 5.10 Mobile Computing 5.11 M –Commerce 5.12 Radiation hazards due to Mobile, SAR	7
	Total	**42**

Laboratory Experiences:

The sample experiments to be performed include, but are not limited to the following.

1. To understand block diagram and working of GSM mobile phone
2. To configure settings for GPRS services for mobile handset
3. To flash mobile phone with appropriate software
4. To understand various faults occurs in mobile handset
5. To understand general fault finding procedure in GSM mobile handset
6. To understand frequency hoping system.
7. To install GPRS cable modem
8. To use AT commands for handset identification
9. To use AT commands for call control
10. To use AT commands for the fault finding
11. To use AT commands for network services and short message services

Reference Books:

1 Wireless Communications: principles and practice -TS Rappaport -Pearson
2 Electronics Communications and systems: fundamentals through advanced -Wayne Tomasi – Pearson
3 Wireless and Mobile Communication, -TG Palanivelu and R Nakkeeran, PHI Publication
4 Modern Latest Mobile Phone Circuits and Fault Finding-Manohar Lotia, BPB Publication
5 Spread spectrum CDMA -Y. Steve Lee, -MGH Publication

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: VLSI Technology
Subject Code: 2361102

Sr. No.	Subject Content	Total Hrs.
1	**INTRODUCTION TO VLSI DESIGN** 1.1 Overview of VLSI design Methodologies 1.2 VLSI Design Flow 1.3 Design Hierarchy 1.4 Concepts of Regularity, Modularity, and locality 1.5 VLSI Design Styles 1.6 Design Quality	**04**
2	**MOS TRANSISTOR** 2.1 The MOS structure 2.2 The MOS system under external bias 2.3 Structure and operation o MOSFET transistor 2.4 MOSFET current –voltage Characteristics 2.5 MOSFET scaling and small geometry effects 2.6 MOSFET capacitances	**06**
3	**MOS INVERTERS** 3.1 Introduction 3.2 Resistive load Inverter 3.3 Inverter with n-type MOSFET Load 3.3.1 Enhancement load NMOS 3.3.2 Depletion Load 3.4 CMOS Inverter 3.4.1 circuit operation and description 3.5 Cascaded CMOS Inverter stages 3.6 Delay time definition 3.7 CMOS ring oscillator 3.8 Switching power dissipation of CMOS Inverter	**10**
4	**COMBINMATIONAL MOS CIRCUIT** 4.1 MOS logic circuits with depletion NMOS load 4.2 CMOS logic circuits 4.3 Complex logic circuit	**10**

5	**SEQUENTIAL MOS CIRCUIT** 5.1 Behaviour of bistable element 5.2 SR latch circuit 5.3 clocked latch and Flip-Flop circuit	**10**
6	**FPGA** 6.1 Types of FPGA 6.2 FPGA structure 6.3 Signal Delay in FPGA	**06**
7	**INTRODUCTION TO VHDL** Program related to basic logic gates, fundamental arithmetic operations and basic sequential and combinational circuits.	**10**
	Total	**56**

NOTE: All mathematical expression and derivations are only for references.

NOTE:- Following are the minimum experiences required, but the college can do more experiences if possible.

Laboratory Experiences:

The sample experiments to be performed include, but are not limited to the following.

1. Introduction to VHDL.
2. To study VHDL entities and coding styles
3. To study signals and datatypes
4. To implement various basic logic gates using VHDL.
5. To implement universal logic gates using VHDL.
6. To implement different Flip-Flop using VHDL.
7. To implement Multiplexer using VHDL.
8. To implement decoder/Encoder using VHDL.
9. To implement 4 bit adder/subtractor using VHDL.
10. To implement 4 bit adder for carry look ahead concept.

Reference Books:

1. CMOS DIGITAL INTEGRATED CIRCUITS -Sung Mo Kang -TMH
2. VLSI design -A.A.Raj and T. Latha -PHI
3. CMOS VLSI Design - Weste, Harris, Banerjee - Pearson
4. Circuit design with VHDL – Volnei A Pedroni - PHI
5. Essentials of VLSI circuits and systems -Eshraghian, Pucknell and Eshraghian -PHI
6. Introduction to VLSI circuits and systems - J.P. Uyemura -Wiley India
7. VHDL for engineers -K. L. Short -Pearson
8. VHDL design -J Bhaskar -Pearson

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Computer Networks
Subject Code: 2361103

Sr. No.	Subject Content	Total Hrs.
1	**HARDWARE STRUCTURE OF NETWORKS** 1.1 Advantages of computer networks 1.2 Applications of computer networks: Business applications, home applications 1.3 Point-to-point networks and broadcast networks 1.4 Network topologies: - Star - Ring - Bus - Mesh - Tree 1.5 Network categories: - LAN - WAN - MAN	9
2	**REFERENCE MODELS** 2.1 Definition of Protocol 2.2 The OSI Reference Model: Principles applied to determine the layers, Brief functional description of each of the seven layers (Physical layer, Data link layer, Network layer, Transport layer, Session layer, Presentation layer, Application layer) 2.3 The TCP/IP Reference Model: Brief functional description of each of the layers (Host-to-network layer, Internet layer, Transport layer, Application layer) 2.4 Comparison of the OSI and TCP/IP Reference Models	8
3	**LAN TECHNOLOGIES** 3.1 Transmission Media: Unguided Guided media 3.2 Network devices: - Network Adapters - Hubs - Switches	8

	- Routers - Access points - Gateways - Connectors 3.4 Servers: - File - Print - Mail - Proxy - Web	
4	**TCP/IP AND INTERNET** 4.1 Internet architecture: Internet addresses, gateway addressing, network and broadcast addressing, dotted decimal notation, loopback addressing, weakness in addressing 4.2 Datagrams: IP datagram format, UDP frame format 4.3 IPv6 4.4 TCP: Introduction, frame format, connection establishment and Termination	**6**
5	**INTRODUCTION TO HIGH SPEED NETWORKING TECHNOLOGIES** 5.1 Cable modem system 5.2 Digital Subscriber Line technology: HDSL and ADSL 5.3 Fast Ethernet 5.4 Gigabit Ethernet 5.5 FDDI and CDDI	**5**
6	**INTERNET APPLICATIONS** 6.1 Domain Name System: Introduction, mapping to IP addresses 6.2 World Wide Web: Web browser, HTML, web servers 6.3 Electronic Mail: - Functions of E-mail system - User agent - Message format - Mail Protocols (SMTP, POP3) 6.4 Intranet 6.5 Wireless networks 6.6 Home networks	**6**
	Total	**42**

Laboratory Experiences:

The sample experiments to be performed include, but are not limited to the following.

1. To install & test various network connector, cables

2. To install network file server
3. To install network print server
4. To demonstrate the use of Internet
5. Study of router, repeater & bridge
6. To install web browser
7. To set up new connection or network
8. To create home group and set/change sharing options
9. To install different types of modem such as internal modem, ADSL modem, wireless modem
10. To establish/configure dial up/ broadband/ wireless connection

Reference Books:

1. Computer networks, -A. S. Tanenbaum, -PHI
2. Networks for Computer scientists and Engineers - Y. Zheng and S. Akhtar -Oxford
3. Data Communication & Networking, -Forouzen, -TMH
4. Data Communication & Computer Networks, -Brijindra Singh, -PHI

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Medical Electronics (Elective)
Subject Code: 2361104

Sr. No.	Subject Content	Total Hrs.
1	**BIOMETRIC SYSTEMS** 1.1 Factors to be considered for designing medical instrumentation systems 1.2 Components of man-instrument system 1.3 Problems in measuring a living system 1.4 Physiological signals: electrical potentials generated in the heart, brain & muscle	6
2	**BIO-ELECTRIC SENSORS AND AMPLIFIERS** 2.1 Transducers: passive and active transducers, biomedical transducers : pressure , displacement, surface strain, velocity, temperature, light, magnetic field, pulse sensor, respiration sensor 2.2 biochemical transducers: reference electrode, pH electrode, blood gas electrode, specific ion electrode 2.3 Bio electrodes: Electrode tissue interface, contact impedance, Types of electrodes, biopotential electrodes: microelectrodes, needle electrodes, skin surface electrodes, Electrodes used for ECG , EEG 2.4 Bioelectric amplifiers and their properties. 2.5 Isolation amplifiers, optically coupled isolation amplifiers. 2.6 Input guarding & shielding	12
3	**PATIENT MONITORING SYSTEMS** 3.1 Heart rate measurement 3.2 Pulse rate measurement 3.3 Respiration rate measurement 3.4 Blood pressure measurement 3.5 Principle of defibrillator and pace mark	8
4	**BIO MEDICAL RECORDERS** 4.1 ECG Machine: Block diagram description, lead system, preamplifier and Application, EEG telemetry system 4.2 EEG Machine: Block diagram description, preamplifier and application 4.3 EMG Machine: Block diagram description and application	8

5	**MEDICAL IMAGING SYSTEMS** 5.1 Projection radiography: introduction, x-ray tube, beam restriction, compensation filters, radiographic film, block diagram of x-ray image intensifier 5.2 Ultrasound imaging systems: ultrasound transducer, ultrasound probes, block diagram of ultrasound imaging system, applications 5.3 Computed Tomography: introduction, helical CT scanner, X-ray source and collimation, CT detectors 5.4 Emission Computed Tomography: Anger camera, scintillation detector, SPECT and PET instrumentation 5.5 Magnetic Resonance Imaging: block diagram of MR scanner components, magnet, gradient coils, RF coils, scanning console	**10**
6	**ADVANCED TOPICS** 6.1 Endo illumination and endoscopy using fiber optics technique. 6.2 Bio telemetry principle and applications 6.3 Telemedicine 6.4 Laser and its applications in medicine 6.5 Implantable circuits	**6**
7	**SAFETY ASPECTS OF MEDICAL INSTRUMENTS** 7.1 Physiological effects of electric current 7.2 Shock hazard from equipment 7.3 Accident prevention methods: grounding, double insulation, protection by low voltage, ground fault circuit interrupter, isolated power distribution systems	**6**
	Total	**56**

NOTE:- Following are the minimum experiences required, but the institutes can do more experiences if possible.

Laboratory Experiences:

The sample experiments to be performed include, but are not limited to the following.

1. Demonstration of Bio-Medical Electrodes
2. To plot characteristics of various transducers
3. To plot characteristics of various biochemical transducers
4. To study and demonstrate ECG Machine
5. To demonstrate ECG recording
6. To study and demonstrate EEG Machine
7. To study and demonstrate X-Ray Machine
8. To study applications of laser in surgery
9. To study MRI
10. To study Computed Axial Tomo Graphy Machine
11. Study of Electrical Hazards and safety aspects.

Reference Books:

1. Handbook of biomedical Instrumentation, -RS Khandpur- TMH
2. Modern Electronics Equipment, - RS Khandpur, -TMH
3. Biomedical Instrumentation, - Cromwell, Weibell, Pfeiffer -PHI
4. Introduction to biomedical equipment technology, - JJ Car, JM Brown -Pearson
5. Medical imaging signals and systems, - JL Prince and JM Links - Pearson
6. Electronics in Medicine and biomedical instrumentation, -NK Jog -PHI

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Object Oriented Programming (Elective)
Subject Code: 2361105

Sr. No.	Subject Content	Total Hrs.
1	**MOVING TO C++** 1.1 Data types: simple, enumerated, aggregate, pointer, type void, type reference 1.2 Operators: arithmetic, logic, unary, binary, sizeof, comma 1.3 Preprocessor directives 1.4 Declaration: keywords, constant, variable, function, object 1.5 Block structure in C++ 1.6 I/O manipulators: endl, setw(), setprecision() 1.7 Statements: expression, assignment, selection, iteration, jump 1.8 Structure of a C++ program	5
2	**CLASSES AND OBJECTS** 2.1 Features of object oriented programming 2.2 Benefits of object oriented programming 2.3 Introduction to classes and objects 2.4 Data hiding and encapsulation 2.5 Member functions 2.6 Accessing class members 2.7 Objects as function parameters 2.8 Static data members and methods 2.9 Friend function and friend class	8
3	**CONSTRUCTORS AND DESTRUCTORS** 3.1 Constructors 3.2 Parameterized constructor 3.3 Constructor overloading 3.4 Constructors with default arguments 3.5 Destructors 3.6 Copy constructor 3.7 Array of objects	7
4	**OVERLOADING** 4.1 Function overloading 4.2 Scoping rules 4.3 Functions with default arguments	6

	4.4 Inline functions 4.5 Operator overloading: unary operator, binary operator	
5	**INHERITANCE** 5.1 Introduction to inheritance 5.2 Base and derived class 5.3 Overriding functions 5.4 Base and derived class constructors 5.5 Multiple inheritance 5.6 Hierarchical inheritance 5.7 Levels of inheritance 5.8 Hybrid inheritance 5.9 Virtual base class and its constructor	**8**
6	**POINTERS** 6.1 Pointer to object 6.2 this pointer 6.3 Void pointer 6.4 Pointer to function 6.5 New and delete operators 6.6 Dynamic memory allocation	**8**
7	**VIRTUAL FUNCTIONS AND POLYMORPHISM** 7.1 Introduction to polymorphism 7.2 Pointer to derived class objects 7.3 Virtual functions 7.4 Dynamic binding 7.5 Pure virtual functions 7.6 Abstract classes	**7**
8	**INPUT/OUTPUT AND FILE HANDLING** 8.1 Stream I/O classes 8.2 I/O using IOS class 8.3 I/O manipulators 8.4 Classification of files 8.5 File and streams/classes 8.6 Text files 8.7 Binary files 8.8 File opening modes 8.9 File pointers 8.10 Accessing sequential access files and direct access files 8.11 Command - line Arguments.	**7**
	Total	**56**

Laboratory Experiences:

Students should write C++ programs based on the topics prescribed in this Syllabus .

Reference Books:

1. Object Oriented Programming with C++, -MP Bhave and SA Patekar -Pearson
2. Object Oriented Programming with C++, -Saurav Sahay -Oxford
3. Object Oriented Programming in C++, -Robert Lafore -Pearson
4. Object Oriented Programming with C++, -E. Balagurusamy, -TMH
5. Object Oriented Programming with C++, -Jesse Liberty & keugh, -PHI

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Mechatronics (Elective)
Subject Code: 2361106

Sr. No.	Subject Content	Total Hrs.
1	**INTRODUCTION TO MECHATRONICS** 1.1 Domains of mechatronics 1.2 Objectives of mechatronics 1.3 Applications of mechatronics 1.4 Advantages and limitations of mechatronic systems 1.5 Examples of mechatronic systems 1.6 Flexible manufacturing system: introduction, constituents of an FMS, integration of constituents, benefits of flexible manufacturing system	8
2	**MECHANICAL SYSTEMS** 2.1 Basic concepts: force, moment, couple, friction 2.2 Behavior of materials under load: stress, strain, stress-strain behavior, bending of beams, torsion on shaft 2.3 Mechanism: lever and four-bar mechanism, bearing, clutches, rachet, Geneva, gear train, rack-and-pinion 2.4 CNC machines: introduction, constituent parts and advantages of CNC machines 2.5 Machine structure: static load, dynamic load, thermal load 2.6 Guideways: applications; design considerations; types of guideways- flat, V, dovetail, cylindrical, antifriction linear motion 2.7 Feed drives: servomotor; mechanical transmission system- introduction to recirculating ball screws and roller screws; torque transmission system- gear box, timing belts 2.8 Spindle assembly: spindle; spindle bearings- hydrodynamic, hydrostatic, antifriction	12
3	**DRIVES** 3.1 Drives in metal cutting machine and lathe machine 3.2 Spindle drives: requirements and types of spindle drives 3.3 Feed drives: requirements, DC and AC feed drives 3.4 Servo principle: SCR-DC drives, transistor PWM DC drive	10

	circuits for one quadrant and four quadrant operations, advantages over thyristor drive, brushless DC drive 3.5 AC servo drives: limitations of DC drives, features of AC servomotor, AC PWM transistor feed drive- block diagram and operation 3.6 Stepper motor	
4	**SENSORS AND MOTION CONTROL DEVICES** 4.1 Hydraulic actuators and pneumatic actuators, diaphragm, bellows 4.2 Internal sensors: potentiometer, tachometer, resolver, optical encoder, hall sensor, Moire's fringe sensor 4.3 External sensor: proximity sensors, range finder, tectile sensors 4.4 Force sensor and acoustic wave sensor 4.5 Mechanical switches 4.6 Solenoids 4.7 Microactuator: microgripper, micromotor	**10**
5	**CNC SYSTEMS** 5.1 Configuration of a CNC system 5.2 CPU 5.3 Servo-control unit 5.4 Operator control panel, 5.5 Machine control panel 5.6 Peripheral devices 5.7 Computer aided design and computer aided manufacturing	**8**
6	**PROGRAMMING OF CNC MACHINES** 6.1 CNC machine operations 6.2 Compensation and override 6.3 Coordinate system 6.4 CNC programming procedure 6.5 Interpolation 6.6 Cutter compensation 6.7 Part program	**8**
	Total	**56**

NOTE:- Following are the minimum experiences required, but the college can do more experiences if possible.

Laboratory Experiences:

The sample experiments to be performed include, but are not limited to the following.

1 To implement application of various sensors
2. To study and demonstrate DC servomotor

3. To study and demonstrate AC servomotor
4. To study and demonstrate stepper motor
5. To study and demonstrate different types of drives
6. To implement close loop speed control system using DC/AC servomotor and techo
7. To measure different static characteristics of potentiometer
8 To implement application of tachometer
9. To study and demonstrate proximity sensors
10 To implement application of tachometer

Reference Books:

1. Introduction to Mechatronics - Appuu Kuttan K. K. -Oxford University Press
2. Mechatronics - HMT Limited – MGH

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING

SEMESTER- VI

Subject Name: Consumer Electronics (Elective)
Subject Code: 2361107

Sr. No.	Subject Content	Total Hrs.
1	**AUDIO SYSTEMS** 1.1 Microphones: characteristics of microphones; types and applications of microphones: carbon,crystal, electret, tie-clip, wireless 1.2 Loud speakers: properties of ideal loudspeaker, basic loud speaker; types of loudspeakers: crystal, electrostatic, permanent magnet; woofers; tweeters; hi-fi system; multispeaker system; crossover networks; impedance matching 1.3 PA system: introduction, planning, speaker matching, characteristics, amplifiers, interconnections of equipments 1.4 Theatre sound system: sound track recording on film, sound reproduction from sound track, block diagram and working of a theatre sound system	14
2	**DOMESTIC APPLIANCES** 2.1 Digital clock: divide-by-60 circuit, simplified and detailed block diagrams, LSI digital clock 2.2 Microwave oven: basic structure, functional block diagram, timer with alarm circuit, single chip controllers, troubleshooting 2.3 Washing machine: Electronic controller for washing machine, hardware, washing cycle, fuzzy logic washing machines 2.4 Airconditioners: air-conditioning, components of AC systems, all air AC systems, controls and features of airconditionder 2.5 Camcorders: Camcorder/ video camera basics and features, video camera functional blocks, Lens/iris/motors, Sync generator circuitry, Camera pick-up devices, Camera auto-focus operation, Slide switches and control buttons	14
3	**COMPUTERS** 3.1 Anatomy of a computer: Motherboard, CPU, SMPS, Expansion slots, Front Panel / Rear side connectors, switches and indicators, specification parameters 3.2 Schematics and operations of input devices: Keyboard, Mouse, Touch pads, Joysticks, Scanners, Barcode reader 3.3 Schematics and operations of output devices: Dot matrix printers,	16

	Laser printers, Color printers, Plotters 3.4 Display Devices: video basics, anatomy of CRT, LCD and TFT displays, resolution, dot pitch, data projectors, touch screens 3.5 HDD: Introduction, HDD construction, operation, HDC block diagram, working principle, IDE, SCSI, ultra ATA, and SATA series, installation, partitioning, formatting, Boot record 3.6 CMOS setup program & POST: CMOS setup program, various setup options, POST definition, POST test sequence, beep codes, error messages 3.7 Modem: block diagram and operation 3.8 Facsimile: block diagram, operations at transmitting end and receiving end	
4	**AUTOTRONICS** 4.1 Applications of solid state devices in automobiles 4.2 Car engine management system 4.3 Electronic ignition lock system 4.4 Dashboard computer 4.5 Electronically controlled suspension 4.6 Car safety belt system 4.7 Vehicle proximity detection system 4.8 Car navigation system	**12**
	Total	**56**

NOTE:- Following are the minimum experiences required, but the college can do more experiences if possible.

Laboratory Experiences:

The Sample Experiments To Be Performed Include, But Are Not Limited To The Following.

1. To plot frequency response of different types of loudspeakers
2. To plot frequency response of crossover network
3. To establish PA system
4. To study functional block diagram and front panel controls of microwave oven
5. To study functional block diagram and front panel controls of washing machine
6. To demonstrate the operation of air conditioning system
7. To demonstrate assembling of computer
8. To install HDD and create partitions
9. To install various types of input/output devices
10. To configure CMOS setup
11. To install and calibrate different types of printers

Reference Books:

1. Consumer electronics - SP Bali, -Pearson
2. Fundamentals of Computers - V. Rajaraman
3. How Electronic Things Work…. And What to Do When They Don't -Robert L. Goodman, - MGH
4. Consumer Electronics - B. R. Gupta, -S.K. Kataria & Sons
5. Introduction to Mechatronics - Appu Kuttan K.K.-Oxford
6. IBM PC and Clones - Govindarajulu - TMH
7. Introduction to Computers - Peter Norton - TMH
8. Troubleshooting, Maintaining & Repairing PCs - Stephen J. Bigelow - TMH

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA IN ELECTRONICS & COMMNICATION ENGINEERING
SEMESTER- VI

Subject Name: - Project-II
Subject Code: 2361108

PROJECT WORK:

The Students Should Carry Out the Project Work in a Phased Manner Such As

1. Selection of Project
2. Circuit Design
3. Tracing of circuit
4. PCB Design
5. PCB etching work
6. Testing of components
7. Soldering & Assembling work
8. Testing and troubleshooting of circuit
9. Writing Project Report
10. Seminar Related to the project work

The project should be based on novel ideas, systems, gadgets or circuits related to the field of Electronics and Communication Engineering. Depending on the complexity of the project, the project work may be carried out individually or in groups of not more than 5 (five) students.

SCHEME OF ASSESSMENT AND EVALUATION OF STUDENT:

At the end of the term, the student will be evaluated and assessed by both the external and internal examiners on the basis of work done during semester for project, testing and working of project and overall presentation by student.