SARDAR PATEL UNIVERSITY
B.Sc (3rd Semester)
Electronics
US03CELE01
Electronic Devices.
(Three credit course – 3 hours per week)
(Effective from June 2011)

Unit 1 Electronic components :-
Passive components, Resistors, Fixed resistors, variable resistors, capacitor :- Mica capacitor, Ceramic capacitors, Paper capacitors, Electrolytic capacitors, variable capacitors.

Unit 2 Electronic components :-
Inductors, Active Components and its leads identifications. Step voltage response of an RL Circuit, Step voltage response of an RC circuit, Step voltage response of second order (RLC) circuit.

Unit 3 Introduction to PN junction Diodes:-
Introduction to PN junction diode, P-type semi-conductor, N-type semi-conductor, The PN-junction, Reversed biased junctions, Forward biased junction, temperature effects, voltage doublers, voltage clampers, diode limiter.

Unit 4 Diodes and its Applications :-
Half wave rectifier, peak rectifier, full wave rectifier, capacitor filtering of half wave rectifier, capacitor filtering of full wave rectifier, AM modulation :- definition and derivation, amplitude modulation methods, square - Law diode-modulator, Amplitude Demodulation using diode.

Unit 5 Special Types of Diodes :-
Voltage variable capacitor diode, Thermister, Tunnel diode, Tunnel diode reverse bias, tunnel diode forward bias and its characteristics.

Unit 6 charge couple devices :-
The charge couple devices (CCD), storage of charge, transfer of charge, input and output arrangement, schottky diode, UJT and it's applications.

Text Books :

1. Electric engineering fundamentals, Vincent Deltore (2nd Edition)
2. Electronics devices and circuit, David Bell,
3. Digital integrated electronics, Herbert Taub, Donald Schilling
4. Basic Electronics by Bhargava

SARDAR PATEL UNIVERSITY
B.Sc. (Semester – 3)
Subject: Electronics Course:US03CELE02
Instrumentation and Digital Electronics
(Three Credit Course – 3 Hours per week)

Unit – 1 Measurement and Errors

Definition: Accuracy and Precision, Types of Errors: Gross Error, Systematic Errors, Random Errors, Statistical Analysis, Probablity of Errors, Limiting Errors, Definition-Electrical National Standards-The Absolute Ampere, Resistance, Voltage, Capacitance and Inductance

Unit – 2 Oscilloscope

Introduction, Oscilloscope Block diagram, Cathode Ray tube, Electrostatic focusing, Electrstatic Deflection, Screens of CRTs, CRT connections, Function of Delay Line

Unit – 3 Number System

Various Number Systems-Decimal, Binary, Octal and Hexadecimal, Their interconversions and Airthmrtic, Binary Airthmetic in Computers, Negative Number Representation, 1's Complement and 2's Complement.

Unit – 4 BCD Codes

Types of BCD Codes, BCD addition, Weighted Binary Codes, Non Weighted Binary Codes, Excess 3 Code, Excess 3 addition, Excess 3 Subtraction, Gray Code, Binary to Gray and Gray to Binary Conversions, Error Correcting Codes, ASCII Code

Unit – 5 Boolean Algebra

Introduction to Boolean Algebra, Logic Operators and Logic gates- AND, OR, NOT, Positive and Negative Logic systems, Universal building blocks NAND and NOR

Unit – 6 Boolean Algebra

Boolean Laws, Demorgam's theorem, Reduction of Boolean expression using Boolean Laws, Karnaugh map minimization up to 4 variables, SOP method, Pos method NAND and NOR minimization

Scope of syllabus:

Text Books:

1. Modern Electronics Instrumentation & Measurement Techniques(Unit 1) By A. D. Helfrick& W. D. Cooper
2. Digital Electronics By William Gothmann(Unit 3,4)
3. Digital Principles & Applications(Unit 3 to 6) by A. P. Malvino& D. P. Leach

Reference Books:

1. Digital fundamental By Thomas L. Floyd
2. Digital and Micro processor Electronics By Byron W. Putman
3. Digital Electronics By C. E. Strangio
4. Digital Computer Electronics(Unit 5) (An Introduction to Microcomputer) By A. P. Malvino

SARDAR PATEL UNIVERSITY
B.Sc (3rd Semester)
Electronics
US03CELE03 Practical.
(Three credit course – 6 hours per week)
(Effective from June 2011)

1. Use of multimeter.
2. Use of CRO
3. Phase angle using CRO
4. Step response of RC circuit (Charging – Discharging of capacitor)
5. Tunnel diode
6. Thermister characteristics
7. Calibration of thermocouple
8. To study of transformer
9. Voltage multiplier
10. UJT characteristics
11. UJT oscillator
12. Logic gate using discrete component
13. Logic gate using ICs
14. Reduction of Boolean expression
15. 7489(RAM)
16. 74181(ALU)

And other experiments based on syllabus

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 3)
Subject: Electronics
Course: US03CELC01
Electronics & Communication
(Three Credit Course – 3 Hours per week)
(Effective from June-2011)

Unit 1. Vector Algebra
Vector algebra, dot product, cross product, triple product, differentiation of vectors, velocity & acceleration, scalar & vector functions, gradient, divergence, curl & their application.

Unit 2. Vector Integral Calculus
Integration of vector, line integral, surface integral, circulation work & flux, volume integral, Green's theorem, Stoke's theorem, Divergence theorem, Del applied to function of different co-ordinate system.

Unit 3. Fourier Series-I
Periodic function, Fourier series, Euler's formula, Formulae for determining fourier co-efficient.

Unit 4. Fourier Series-II
Fourier series of discontinuous functions, change of interval, expansions of odd & even periodic function, half range fourier series.

Unit 5. Laplace Transform
Definition of Laplace transform, properties of laplace transform, laplace transform of derivatives and integral, multiplication by T^n Inverse Transform.

Unit 6. Fourier Transform
Definition of Fourier transform, properties of fourier transform, convolution theorem, Parseval's Identity, relation between Fourier and Laplace transform.

References:-

1. Higher Engineering Mathematics: B.S.Grewal.
2. Advanced Engineering Mathematics: E. Kreyzig.
3. Applied Engineering Mathematics (VOL 1): Stroud.
4. Higher Engineering Mathematics: K.R.Kachot

SARDAR PATEL UNIVERSITY
B. Sc. (3rd Semester)
Electronics And Communication.
US03CELC02 Analog Communication
(Three credit course – 3 hours per week)
(Effective from June 2011)

UNIT 1 Principles of Communication system:

General communication system, Basic constituents of the communication system, Information source, transmitter, channel, receiver, Need for using high carrier frequency, classification of RF spectrum, Band width requirement, Classification of Noise, Types of Noise, Signal to Noise Ratio, Noise figure.

UNIT 2 Modulation:

Definition, Expression andWave forms of Amplitude modulated Voltage, Definition, Expression andWave forms of Frequency modulated Voltage, Definition, Expression andWave forms of Phase modulated Voltage, Side bands of AM and FM wave.

UNIT 3 Method of Amplitude modulation and Demodulation:

Classification of Amplitude modulation methods, Collector modulation, Square law diode modulation, Classification of Amplitude demodulation methods, Square law diode detector, Linear diode Detector, Choice of time constant RC in the Detector circuit.

UNIT 4 Method of Frequency modulation and Demodulation:

Classification of Frequency modulation methods, Reactance Tube frequency modulator, Reactance FET, Reactance FET Frequency modulator, Frequency modulation using Varactor diode, Classification of FM detectors, Slope detector, balanced slope detector, Ratio detector.

UNIT 5 Antennas:

Introduction, Antenna Action, Short electric doublet, Radiation Resistance and Power of Short electric doublet, Thin linear Antenna, Antenna measurements (Total Aerial Resistance, Radiation Resistance, Effective height).

UNIT 6 Wave Propagation:

Types of Radio wave Propagation, Ground wave Propagation, Surface wave Propagation, Ionospheric Propagation, Space wave Propagation, Range of space wave propagation.

Reference Books:

1. Radio Engineering, (Applied Electronics Vol-2) by G.K.Mithal.
2. Electronics Communication by Danis Roddy and Jhon Coolen.
3. Electronics Communication Systems by Kennedy.

Sardar Patel University

B.Sc (3rd Semester)
Electronics And Communication.
US03CELC03 Practical.
(Three credit course – 6 hours per week)
(Effective from June 2011)

1. To determine Bandwidth of CE Amplifier.
2. Amplitude Modulation of Carrier signal and calculation of modulation index.
3. Frequency Modulation of Carrier Signal.
4. Phase Modulation of Carrier signal.
5. Amplitude Demodulation and effect of time constant of Load circuit.
6. To generate Carrier signal using Hartley's Oscillator.
7. To generate Carrier signal using Colpitt's Oscillator.
8. To generate Audio signal using Phase shift Oscillator.
9. To generate Audio signal using Wein bridge Oscillator.
10. To study Feedback Amplifier.
11. To study Power supply and measure Line and Load Regulation.
12. Radiation Patterns of the Antenna.

And other experiments based on syllabus.

Computer Hardware
US03EELE01
Fundamentals of Computer Hardware.
(Two credit course – 2 hours per week)

(Effective from June 2011)

UNIT – 1 SYSTEM CONPCEPT PRIMARY STORAGE UNIT

System concept: Input unit, Output unit, Storage unit, Arithmetic and logic unit, control unit, central processing unit
Computers for individual: desktop computer, workstations, notebook, tablet computers, handheld computers, smart phones,
Computers for organisations: network servers, mainframe computer, supercomputer,
Primary Storage unit: storage locations and addresses, storage capacity, fixed and variable word length storage, RAM, ROM, PROM , EPROM, CACHE memory, Registers

UNIT - 2 SECONDARY STORAGE DEVICES:

Sequential and direct access devices, Magnetic storage devices: magnetic tape, magnetic disc, hard disk, removable disk, diskettes, Optical storage devices: CDROM, DVDROM, Recordable optical technology,Flash memory, smart memory,

UNIT – 3 INPUT DEVICES

Key board, Mouse, Devices for the hand held : Pen, Touch screen, Game controller,
Optical input devices: Barcode reader, magnetic – ink character reader(MICR), Scanner, Image scanner, Optical character reader, Audio input devices: microphone, other audio input devices, Video input devices: digital camera,

UNIT – 4 OUTPUT DEVICES

Monitors : CRT monitors, flat panel monitors – LCD and other types of monitors,
Comparing monitors: Size, Resolution, Refresh rate, Dot pitch
Printers: Types of printers: impact an nonimpact printer, Dot matrix printer, Inkjet printer, Laser printer,
Comparisons of printer: image quality, speed, initial cost, cost of operation,
Photo printer, Thermal wax printer, dye –sub printer, Plotters

TEXT BOOK:

1. Computer Fundamentals By P.K. Sinha (BPB Publications)
2. Introduction to Computers By Peter Norton (Sixth Edition) (The McGraw- Hill Companies)