SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Power Electronics and Op Amp Application
Course: US06CELC21 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1   **Thyristors**

Introduction of Thyristors, Thyristor Type : SCR (Sillicon Controlled Rectifier), Triggering device for SCR, Series and Parallel Operation of SCR, DIAC, TRIAC construction, Charateristics, Phase Control of TRIAC using DIAC..

Unit: 2   **Commutation Methods of Thyristors**

Introduction, Commutation of Thyristors, Classification of forced commutation methods : Class-A, Class-B, Class-C, Class-D, Class-E, Class-F, Auxiliary current commutation.

Unit: 3   **Op-amp, Basic op-amp**

Op-amp parameter: AC & DC parameter, Inverting amplifier, Non-inverting amplifier, Difference amplifier, Subtractor, instrumentation amplifier, Voltage follower, Summing amplifier.

Unit: 4   **Filter**

Introduction,Comparison of Active & Passive filter,Characteristics and its response, Active low pass filter, Active high pass filter, Active band pass filter, Notch filter, All pass filter.

Basic Text & Reference Books:-

- Power Electronics – P.S.Bhimbra.
- Thyristorized Power Controllers – G.K.Dubey.
- Power Electronics-1 – J.S.Katre.
- Operational Amplifier & Linear integrated Circuits – R.A.Gayakwad
- Electronics Instrumentation and Measurement system – J.G. Joshi
- Digital Principles and its Application – Malvino and Leach

B.Sc. (Semester – 6)
Subject: Microprocessor Interrupts & Interfacing
Course: US06CELC22 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1   Interrupts

Input-output execution, 8085interrupts, interrupts instructions and their utilization, restart as software instructions

Unit: 2   Programmable interface devices

Programmable Basic concepts in programmable devices, 8155 multipurpose programmable devices, handshake mode 8279 programmable keyboard/display interface.

Unit: 3   General purpose programmable Peripheral devices

The 8255A Programmable peripheral interface, 8259A Programmable interrupts controller, direct memory access and 8237 DMA controller.

Unit: 4   Serial I/O Data communication

Basic concepts, software control asynchronous serial I/O, 8085 – Serial I/O lines: SOD and SID.

Basic Text & Reference Books: -

➢ Microprocessor, Architecture, Programming and Application with 8085/8080 – Ramesh S. Gaonkar

➢ Fundamentals of microprocessors and microcomputers – B. Ram (Dhanpat Rai Pub.)

➢ Digital Computer Electronics – An Introduction to microcomputers – A.P.Malvino (Tata McGraw Hills)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Microwave Device & Optical Fiber Communication
Course: US06CELC23 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1   **Microwave Transmission Lines**
Microwave region and band designation; advantages of microwaves; applications of microwaves.Introduction; Transmission Line Equations and Solutions; Reflection Co-efficient and Transmission Co-efficient; Standing wave and Standing wave ratio; Line impedance and admittance; Smith chart; impedance matching

Unit: 2   **Microwave Components, Tubes and Circuits**
Introduction; waveguide microwave junction; microwave T-junction; directional couplers; waveguide terminations; ferrite devices; phase shifters; microwave attenuators; High frequency limitation of conventional tubes: Microwave tubes; Klystron; Magnetron.

Unit: 3   **Basic of Optical fiber**
Introduction, elements of fiber optic communication system, advantages, optical spectral band, nature of light, structure of fiber optic cable, Basic optical laws: reflection, refraction, snell's law, total internal reflection, Acceptance angle, Numerical Aperture.

Unit: 4   **Optical Sources and Detectors**
Optical Sources: Introduction, review of semiconductor physics, Light emitting Diode, structure of LED, Light source material, Surface emitting LED, edge emitter LED, Laser Diode, structure, Comparison of LED Vs LASER, Optical Detectors: introduction, PIN photo detector, Avalanche Photodiode.

Basic Text & Reference Books: -
➢ Microwave and Radar Engg..:- M Kulkarni (Umesh Publications).
➢ Microwave Devices and Circuits:- Samuel Liao (PHI).
➢ Microwave Technology:- Dennis Roddy
➢ Optical Fiber Communication –Gerd Keiser (4th Edition)
➢ Optical Fiber Communication: Principles and Practice-J.M Senior (PHI)
➢ Fiber Optic communication –V.B.Patel (ATUL PRAKASHAN)
➢ Optical Fiber Communication-D.C Agarwal (wheeler Publication)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Network Infrastructure Management
Course: US06CELC24 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1   **Network Topology**

Introduction, Applications Topology, Common bus, Star, ring, fully connected, combined topology, OSI model and its various layers, TCP/IP model, Connection Protocols, collision detection.

Unit: 2   **Network Infrastructure**

Design objective, Understanding the networking environment, fundamental design principles, requirement analysis of proposed network infrastructure, network managements components.

Unit: 3   **Network Connecting Devices**

Hubs, bridges, repeaters, multiplexers, routers, brouters, gateways, CSU/DSU structural cabling: network topology and network media, coaxial cable, twisted pair, fiber, wireless, satellite, TIA/EIA structural cabling standards.

Unit: 4   **Network Security**

Security strategy, design and implementation, Security tools: Packet filtering, Encryption, Virtual Private Network, Intrusion Detection System, Password management, firewall policies architecture and functioning.

Basic Text & Reference Books:-

➢ Data Communication and Networking - B.A.Forouzan
➢ Computer Networks – A.S.Tannenbaum
➢ A guide to designing and Implementing : Michael Palmer, Robert Bruce

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Practical's
Course: US06CELC25 (Practical)
(Two Credit Course – 4 Hours per week)
(Effective from June-2019)

- ➢ To study the characteristics of SCR.
- ➢ To study Op Amp as a subtractor
- ➢ To study Op Amp as a adder
- ➢ To study Op Amp as a differentiator.
- ➢ To study Op Amp as a integrator
- ➢ To study low pass filter
- ➢ To study high pass filter
- ➢ Practical based on microprocessor 8085.
- ➢ Practical based on microprocessor 8085.
- ➢ Practical based on microprocessor 8085.
- ➢ Practical based on microprocessor 8085.
- ➢ Practical related to computer network
- ➢ Practical related to computer network
- ➢ Project Work related analog or digital Electronics

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 6)
Subject: Instrumentation - II
Course: US06DELC26 (Theory)
(Four Credit Course – 2 Hours per week)
(Effective from June-2019)

Unit: 1 Transformer:

Working principle, construction, core type transformer, shell type transformer, theory of ideal transformer, EMF equation of transformer, voltage transformation ratio, transformer with losses, transformer with winding resistance, equivalent resistance, magnetic leakage.

Unit: 2 Relay & Contactors:

Electromechanical relay, solid-state relay, timing relay, latching relay, relay logic, specifications and rating, Contactors: Size, rating. Input devices: temperature switch, proximity switch, pressure switch.

Unit: 3 Introduction of Transducer:

Introduction, classification of transducers, Performance characteristics of transducers, static characteristics, dynamic characteristics, other characteristics.

Unit: 4 Application of Transducer:

Potentiometric transducer, variable capacitance, linear variable differential transformer (LVDT), linear to angular encoders, Piezo-electric transducers, other displacement sensors

Basic Text & Reference Books:-
- Electrical Machines Vol-1: B.L.Thareja.
- Instrumentations measurements and analysis: B.C.Nakra and K.K.Choudary.
- Electronics and Electrical measuring Instruments: A.K.Sawhney