SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Analog Circuits and Measuring Instruments
Course: US05CELC21 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1 **Amplifier and Oscillator**

Amplifier: Introduction of Amplifier, Classification of Amplifiers, Frequency response of an Amplifier, Power Amplifier: Class A Operation, Class B Operation, Class AB Operation, Push Pull Amplifier, Classification of Oscillators, RC Oscillator: Phase shift Oscillator and Wein Bridge Oscillator, LC Oscillator: Colpitt's Oscillator and Hartley Oscillator, Crystal Oscillator.

Unit: 2 **Ic Applications**

555 Timer IC : Sailent features, Pin Diagram and functional diagram of 555 Timer IC, Astable Multivibrator and its Application, Monostable Multivibrator and it's Application, Bistable Multivibrator, Schmitt Trigger.

Unit: 3 **Bridge**

DC Bridge: Wheaston Bridge, Kelvin Bridge, Un-balance condition , Ac Bridge: Maxwell Bridge, Hay Bridge, Wein Bridge, Schearing Bridge

Unit: 4 **Measuring Instruments**

Introduction, Classification, Analog: Voltmeter, Ohmmeter, Q-meter, Digital voltmeter (DVM), Specification and advantages of DVM, Ramp type DVM, Successive approximation.

Basic Text & Reference Books:-

- Modern Electronics Instrumentation and Measurement Techniques – A.D. Helfrick, W.D.Cooper
- Electronics Instrumentation and Measurement system – J.G. Joshi
- Linear integrated circuits – N.N.Bhargava, S.C.Gupta, D.C.Kulshreshta
- Integrated Electronics – Jacob Millman & W. Halkias

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Introduction to 8-bit 8085 Microprocessor
Course: US05CELC22 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1 **Microprocessor Architecture**

The 8085 microprocessing unit, bus timing, demultiplexing the bus, generating the control signal, 8085 architectures, instruction classifications, instruction format, method of writing and executing simple program.

Unit: 2 **Microprocessor instruction & Programming technique**

Overview of 8085 instruction set, addressing modes, and data transfer instructions, arithmetic instruction, logical instructions, and branch instructions. Programming techniques: Looping counting indexing, 16 bit arithmetic instructions, logic operations: Rotate, Compare.

Unit: 3 **Counter & Stack operation**

Counters and delays, hexadecimal counter, modulo-10 counter, Stack and subroutines conditional and unconditional CALL & RETURN instruction, advanced subroutine concepts.

Unit: 4 **Code Conversion**

Code conversion: BCD to binary, binary to BCD, BCD to seven segments. Binary to ASCII and ASCII to Binary, BCD addition, BCD Subtraction, Introduction to advanced Instructions and applications.

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 McGrawHills)

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Digital Communication System and Antenna
Course: US05CELC23 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1 **Sampling**

Introduction, The sampling Theorem, proof of sampling theorem, Nyquist rate and Nyquist Interval, Reconstruction filter, Signal reconstruction: the Interpolation Formula, Effect of under sampling, sampling techniques, comparison of various sampling techniques

Unit: 2 **Pulse Modulation**

Pulse Modulation, Analog Pulse Modulation, Pulse Amplitude Modulation, generation and Detection of PAM, Pulse Time Modulation, Pulse Width Modulation, generation and Detection of PWM Signal, Pulse Position Modulation, Generation and Detection of PPM Signal, Pulse code Modulation, transmission Bandwidth in PCM, Non Uniform Quantization, Companding, Compander Characteristics.

Unit: 3 **Digital Modulation Techniques**

Introduction, Digital modulation Format, types of digital modulation techniques, Coherent Binary ASK, Binary phase shift keying, coherent Binary Frequency shift keying, Non coherent Binary modulation techniques.

Unit: 4 **Antenna Basics**

Basic antenna parameters, radiation intensity, directivity and gain, directional properties of dipole antenna, antenna aperture, effective area, effective height, antenna terminal impedance, transmission loss between antennas, antenna temperature & S/N ratio, space communication.

Basic Text & Reference Books:-

- Electronic Communication System – Blake (Thomson and Delmar)
- Electronic Communication System – Fundamental through Advance – Wayne Tomasi (Pearson Education Asia)
- Antennas – J.D.Krauss (McGraw Hill)
- Electromagnetic Waves and Radiating System – E.C.Jordan & K.G.Balmain

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Data Communication and Network
Course: US05CELC24 (Theory)
(Four Credit Course – 4 Hours per week)
(Effective from June-2019)

Unit: 1 **Computer Network**

Introduction, Application Topology, Common bus, star, ring, fully Connected, combined topology, Need for standard OSI model: physical layer, data link layer, network layer, transport layer session layer, presentation layer, application layer

Unit: 2 **Data Communication and Contention Protocols**

Transmission modes, serial and parallel transmission asynchronous transmission, simplex, half-duplex and full-duplex communication, Interface standard: RS-232 interface, RS 232 subsets, null modems, RS- 449 interface, X 21 interface , Aloha protocols, carrier sense multiple access, Collision detection, Token passing.

Unit: 3 **Data Security and Integrity**

Introduction, parity checking: Parity checking analysis, double-bit error detection, cyclic Redundancy Checks, polynomial division, CRC working, analysis of CRC, CRC implementation using circular shifts. Hamming codes: single-bit error correction, multiple-bit error correction comparison of error detection and error correction, Viruses infecting files, memory resident viruses, virus evolution, virus sources, Internet worm, Computer hackers

Unit: 4 **Protocol concept and Networking**

Basic flow control signaling, frame oriented control, protocol efficiency, Sliding window protocols frame format, go back-protocol. Selective repeat protocol, sliding window protocol efficiency, Running Novell Netware. Security and integrity Selected Novell commands

Basic Text & Reference Books:-

- Data Communication and Networking - B.A.Forouzan
- Computer Networks and Internets – Douglas E Comer
- Computer Networks – A.S.Tannenbaum

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Practical's
Course: US05CELC25 (Practical)
(Two Credit Course – 4 Hours per week)
(Effective from June-2019)

- To study Astable multivibrator.
- To study Bi-stable multivibrator.
- To study Pushpull Amplifier.
- To study Wein bridge.
- To study Hartley Oscillator.
- To study RC Phase Shift Oscillator.
- To study Collpitt's Oscillator.
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Practical based on microprocessor 8085.
- Project Work related to basic electronics components.
- To study the sampling theorem.
- To study the Pulse Position Modulation.
- To study the Pulse Width Modulation.
- To study the Pulse Amplitude Modulation.
- To study the Amplitude Shift Keying.
- To study the Phase Shift Keying.
- To study the Frequency Shift Keying.
- To study the Pulse Code Modulation.

SARDAR PATEL UNIVERSITY
Vallabh Vidyanagar-388120
B.Sc. (Semester – 5)
Subject: Instrumentation - I
Course: US05DELC26 (Theory)
(Four Credit Course – 2 Hours per week)
(Effective from June-2019)

Unit: 1 Introduction to instruments, typical applications of instrument systems, Functional elements of measurement systems classifications of instruments,Null and deflection types, manually operated and automatic types, analog & digital types.

Unit: 2 Measurements and errors, definition, Accuracy and precision, types of Errors, gross errors, systematic errors, random errors, statistical analysis Arithmetic mean, deviation from mean, average deviation.

Unit: 3 Systems of units of measurement- fundamental and derived units, system of units, electrical & Magnetic units, international system of units, other systems of units, conversion of units.

Unit: 4 Direct current indicating Instruments-Suspension galvanometer torque & Deflection of galvanometer PMMC- Mechanism, DC ammeter, shunt Resistor,

Basic Text & Reference Books:

- Instrumentation Measurement and analysis by B.C.Nakra, K.K.Chaudhary
- Modern Electronics Instrumentation & Measurement Techniques by A.D.Helfrick, W.D.Cooper