

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05CELE21	Total Credit: 04
Title of Paper: Instrumentation	

Unit	Description in detail
I	Wheastone Bridge, Kelvin Bridge, AC Bridge and their applications, Maxwell Bridge, Hay Bridge, Schering Bridge, Wein Bridge.
II	Power Supply: Block diagram of regulated power supply, Discrete voltage regulator circuits – shunt regulator, Series regulator, IC regulators , Three terminal Voltage regulators – 78** and 79** regulator, Parameters of voltage regulator, General purpose Voltage Regulator IC 723 regulator, applications of IC 723 regulator – low voltage regulator, High Voltage regulator, switching regulator
III	Classification of Transducers, Selection of Transducers, Capacitive Transducers, Inductive Transducer, Linear Variable Differential Transformer
IV	Photoelectric Transducer, Piezo electric Transducer, Strain Gauges, Displacement Transducer, Thermocouple, Thermistor characteristics and Applications.

Basic Text & Reference Books:

1. Modern Electronics Instrumentation and Measurements Technique By : A.D.Helfrick and W.D.Cooper
2. Instrumentation Devices and Systems By : C.S.Ragan Sharma and V.S.V.Mani
3. Electronics circuit and devices G. K. Mithal

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05CELE22	Total Credit: 04
Title of Paper: Digital System	

Unit	Description in detail
I	Shift Registers Introduction, Buffer Register, Controlled Buffer Register, Data Transmission in shift registers, Serial-in serial-out shift registers, serial-in parallel-out shift registers Parallel-in serial-out shift register, parallel-in parallel-out shift registers, Bidirectional shift registers.
II	Universal shift register, Dynamic shift registers, Application of shift registers, ANSI/IEEE standard symbols, Tristate switch, The look ahead carry adder, IC parallel Adders.
III	Two's complement Addition and Subtraction using parallel Adders, Serial Adders, BCD Adder, Binary Multipliers, Comparators, IC comparators ,Interfacing Digital & Analog system, Modems & Interfaces, The Schmitt Trigger as an Interfaces circuit.
IV	The role of memory in a computer system, Memory Types and Terminology, memory Organization & operation, Reading and writing, RAMs, ROMs, and PROMs, Constituent of Memories, Read Only Memory (ROM), ROM organization, ROM timing .

Basic Text & Reference Books:

1. Fundamental of Digital circuits By : A.Anand Kumar
2. Digital Integrated Electronics By : Herbert Taub & Donald Schilling
3. Digital Fundamental By : Floyd

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05CELE23	Total Credit: 04
Title of Paper: 8-Bit Microprocessor Programming & Applications	

Unit	Description in detail
I	The 8085 Microprocessor unit, Bus timing, Demultiplexing the bus, Generating control signal, A detailed look at the 8085 Microprocessor and its architecture, Examples of 8085 based microcomputer.
II	Instruction classification, Method of writing and executing a simple program, Addressing modes, Data transfer Instruction set, Arithmetic instruction set, Logical instruction set, program related to Arithmetic and logical instruction.
III	Branch operations and their related programs, writing assembly language programs, Debugging a program, programming techniques : Looping, Counting and Indexing and their related flow charts, Additional Data transfer and 16 bit Arithmetic instruction and related program.
IV	Arithmetic operations related to memory, Logical operations : Rotate and compare and related programs, Dynamic Debugging.

Basic Text & Reference Books:

1. Microprocessor , Architecture, Programming and Applications with the 8085/8080 By : Ramesh S. Gaonkar

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05CELE24	Total Credit: 04
Title of Paper: Analog Communication	

Unit	Description in detail
I	Classification of Radio Receivers, Salient Features of broadcast Receivers, Basic Function of AM Receiver, Principle & Block diagram of superhetrodyne Receiver.
II	RF Amplifier, Frequency Mixer & converters, IF Amplifier, Detector stage, Automatic gain control, Automatic Frequency control.
III	Introduction, Aspect Ratio, Rectangular Switching, Interlaced scanning, Composite video signals, TV camera Tubes, Image orthicon, Vidicon.
IV	Block diagram and Function of Broadcast TV Receiver, RF Tuners, Functions of RF Tuners, Block Diagram of RF Tuner, RF Tuner circuits, Video IF Amplifier, Interstage coupling methods, Transistor video IF Amplifier Circuit.

Basic Text & Reference Books:

1. Radio Engineering (Applied Electronics vol-II) By : G.K.Mithal
2. Basic Radio & Television By : S.P.Sharma

SARDAR PATEL UNIVERSITY

B.Sc (5th Semester)

Electronics

US05CELE25

Practical

(Six credit course — 6 Hours per week)

(Effective from June: 2020)

1. Feedback Amplifier
2. Phase shift Oscillator Using Transistor
3. Hartley and Colpits Oscillator Using Transistor
4. Push Pull Amplifier
5. Regulated Power Supply Using 78XX
6. Regulated Power Supply Using 79XX
7. Shift Registers
8. Wheaston Bridge
9. Maxwell Bridge
10. Regulated Power Supply Using 723
11. Hexadecimal addition using 8085
12. Hexadecimal subtraction using 8085
13. Hexadecimal subtraction using 8085
14. 2's complement of 8 bit data using 8085
15. LVDT
16. SCR Characteristics
17. Diac Characteristics
18. Relaxation Oscillator using UJT
19. Amplitude Modulation & Demodulation
20. Logical operations using 8085

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05DELE26	Total Credit: 04
Title of Paper: Industrial Electronics	

Unit	Description in detail
I	Thyristor, symbolic Representation, principle of operation and characteristics, Methods of turning ON, Turn OFF mechanism, Series and parallel operation of SCRs, String Efficiency.
II	Thyristor, Low Power devices, UJT, UJT Relaxation oscillator, Triac, Triggering Mode.
III	Phase control using Triac, Power control, Static circuit Breaker, Over voltage protection, Time Delay circuits, Logic circuits.
IV	Power Amplifier: Classification of power amplifiers, Class A large signal amplifier, Transformer coupled Audio power amplifier, Second harmonic distortion, Push pull amplifiers – Class A pushpull amplifier, Complimentary Symmetry Amplifier.

Basic Text & Reference Books:

1. An introduction to Thyristor and their Applications By : M. Ramamoorthy
2. Power electronics By: M.D.Singh and K.B.Khanchandani
3. Integrated Electronics By: J.Millman and C. Halkias

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: V
Syllabus with effect from: June – 2020

Paper Code: US05DELE27	Total Credit: 04
Title of Paper: Discrete & Linear Circuits	

Unit	Description in detail
I	Negative Feedback: Non linear distortion, Classification of feedback amplifiers, Feedback concept, Transfer gain with feedback, General Characteristics of negative feedback, Input resistance, Output resistance.
II	Voltage series feedback amplifier (single stage), Current series feedback amplifier, Current Shunt feedback amplifier, Voltage Shunt feedback, Classification of oscillators, Phase shift oscillator, Wein bridge oscillator.
III	Resonant circuit oscillator, general form of an oscillator, Hartley oscillator, Colpitt's Oscillator, Clapp oscillator, Crystal oscillator- series resonant oscillator, parallel resonant oscillator
IV	AC, DC, Stepper Motor, Inverters, Types of Inverters, Series and Parallel inverters, Single phase half bridge inverter, Single phase full bridge inverter .

Basic Text & Reference Books:

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| 1. Integrated Electronics | J.Millman and C. Halkias |
| 2. Linear Integrated Circuits and its applications | P. W. Wani and P. V. Bhat |
| 3. Electronics circuit and devices | G. K. Mital |
| 4. Power Electronics | M.D.Singh and |
| K.B.Khanchandani | |

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06CELE21	Total Credit: 04
Title of Paper: Discrete & Linear Circuits	

Unit	Description in detail
I	Operational Amplifier Block diagram of OP – AMP, Differential amplifier, virtual short concept, AC and DC parameters, Inverting amplifier and its applications – Scale changing amplifier, Summing amplifier, Phase shifting amplifier, Integrator, Differentiator, Summing integrator, Difference amplifier and Subtractor, comparison of active and passive filter, Introduction to – Low pass filter, High pass filter, Band pass filter, Band reject filter, All pass filter.
II	Nonlinear Applications of OP – AMP Feed back diode comparator, Precision rectifier – Half wave precision rectifier, Full wave precision rectifier, Peak detector, Sample and hold (S/H) circuit, Monostable multivibrator, astable multi vibrator, Voltage Controlled Oscillator (VCO).
III	Miscellaneous applications of OP – AMP Log amplifier: Basic equation, Basic logarithmic amplifier, Temperature compensated LOG amplifier, Antilog (Exponential) amplifier, Analog voltage multiplier, Analog voltage divider, Charge amplifier, Frequency to Voltage conversion, Clipper and Clamper circuits, Temperature to Voltage Converter.
IV	IC 555 Timer and PLL Salient features of 555 Timer IC, Pin diagram and Functional diagram, Astable multivibrator and its applications, Monostable multivibrator and its applications, Schmitt trigger, Bistable multivibrator, Basic operating principle of PLL.

Basic Text & Reference Books:

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| 1. Linear Integrated Circuits and its applications | P. W. Wani and P. V. Bhat |
| 2. OP – Amp and linear integrated circuits | R. A. Gaykwad |

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06CELE22	Total Credit: 04
Title of Paper: Digital System	

Unit	Description in detail
I	Types of ROMs, Semiconductor RAMs, Static RAMs, ECL RAMs, Dynamic RAMs, Address multiplexing, DRAM Refreshing, Tri-state switches.
II	Program Logic Devices, PAL, FPLA, PROM, Other PLD features, Magnetic memories, Magnetic core memory, Magnetic Disk memory.
III	Introduction, Digital to Analog (D/A) conversion, The R-2R Ladder types DAC, The weighted Resistor type DAC, Analog to Digital conversion, The Counter type A/D converter, The tracking type A/D converter, The Flash type A/D converter.
IV	Successive Approximation, The Counting Converter, A comparison of converter types, A converter using voltage to frequency converter, A converter using Voltage to Time conversion, A/D converter Specification, Introduction of ADC 0801.

Basic Text & Reference Books:

1. Fundamental of Digital circuits By : A.Anand Kumar
2. Digital Integrated Electronics By : Herbert Taub & Donald Schilling
3. Digital Fundamental By : Floyd

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06CELE23	Total Credit: 04
Title of Paper: 8-Bit Microprocessor Programming & Applications	

Unit	Description in detail
I	Counter and time Delays, Hexadecimal counter, Modulo-10 counter, Pulse timing for flashing lights, Debugging counter and time delay programs, Stack Subroutines, Conditional and Non conditional CALL and Return instructions, Advance Subroutine concept and related examples.
II	Code conversion : BCD to Binary, Binary to BCD, BCD to Seven Segment, Binary to ASCII and ASCII to Binary.
III	BCD Addition, BCD Subtraction, Introduction to Advanced instructions and Applications, Multiplication and Subtraction with carry, the 8085 interrupts, Interrupts instructions and their utilization and their Examples.
IV	Introduction to microcontroller, 8255 Peripheral Interface, 8254 Interval Timer, 8259 Interrupt Controller, DAC & ADC.

Basic Text & Reference Books:

1. Microprocessor , Architecture, Programming and Applications with the 8085/8080
By : Ramesh S. Gaonkar
2. Microprocessor BY: V . J. Vibhute & P .B .Borole

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06CELE24	Total Credit: 04
Title of Paper: Industrial Electronics	

Unit	Description in detail
I	Phase control Half wave and Full wave Phase control circuits, Half controlled Bridge circuits, Dual converter, Application to speed control of motors, Regulated DC power supplies.
II	Choppers, Principle of Chopper operations, control strategies, Step up chopper, Step Up/Down chopper.
III	Chopper configuration, First quadrant Type A chopper, Second quadrant Type B chopper, Two quadrant Type A chopper Type C chopper
IV	Thyristor Protection circuits, Gate control circuits, over voltage and over current protection, Design of snubber circuit, SCR Mounting, Programmable Logic controller, Basic configuration of PLC.

Basic Text & Reference Books:

1. An Introduction to Thyristors and their Applications. By : M Ramamoorthy
2. Thyristor Power Electronics By: M.D.Singh and K.B.Khanchandani
3. Power controller By : G.K.Dubey, S.R.Doralde and A.Joshi

SARDAR PATEL UNIVERSITY
B.Sc (6th Semester)
Electronics
US06CELE25
Practical

(Six credit course — 6 Hours per week)

(Effective from June: 2020)

1. OP-AMP Applications (Inv, Non-inv)
2. OP-AMP Applications (Wein Bridge, Square wave generator)
3. OP-AMP Comparator
4. Active FILTERS Using OP-AMP
5. Clipping & Clamping Circuits
6. Astable & its Applications Using 555
7. Monostable & its Applications Using 555
8. R-2R , weighted Registers DAC
9. 8-bit Analog to Digital Conversion using ADC 0800
10. BCD to Binary Conversion using 8085
11. Binary to BCD Conversion using 8085
12. BCD Addition and Subtraction
13. BCD to Seven segment LED code Conversion using 8085
14. Sum of 16-bit
15. Hexa-decimal division using 8085
16. ASCII to Binary Conversion using 8085
17. Binary to ASCII Conversion using 8085
18. Rotate Operation

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06DELE26	Total Credit: 04
Title of Paper: Analog Communication & Fiber Optics	

Unit	Description in detail
I	Optical Fiber : Comparison of Fiber with Metal cables, Fiber Construction, Principle of fiber optics, Advantage of fiber optics, Types of fibers, Step Index Fibers, Single mode and multimode Fibers, Graded Index Fiber & other type of Fiber.
II	Amplified DC meter, AC voltmeters using rectifier, True RMS responding voltmeters, Differential Voltmeter, Digital Voltmeters- Ramp type DVM, Successive approximations DVM.
III	Recorder- Introduction, Strip chart Recorder, Galvanometer type Recorder, Potentiometric Recorders, Circular chart Recorder, Digital X-Y plotters, Magnetic Recorders, Frequency modulation Recording.
IV	Computer controlled Test Systems, Testing and Audio amplifier, Testing an Radio Receiver, Instrument used in computer controlled instrumentation.

Basic Text & Reference Books:

1. Modern Electronics Instrumentation and Measurements Technique By : A.D.Helfrick and W.D.Cooper
2. Instrumentation Devices and Systems By : C.S.Ragan Sharma and V.S.V.Mani
3. Electronic Instrumentation By: H.S.Kalsi
4. Fiber Optics communication By:D C Agarwal
5. Optical FiberCommunication By: Gerd Keisar

SARDAR PATEL UNIVERSITY
Programme: B.Sc (Electronics)
Semester: VI
Syllabus with effect from: June – 2020

Paper Code: US06DELE27	Total Credit: 04
Title of Paper: Analog Communication & Fiber Optics	

Unit	Description in detail
I	Principle of colour TV, Colour TV Camera, Picture Tubes in TV system, Colour TV Transmission & Reception, PAL system.
II	Optical Fiber Sources & Detectors, LED, LASERS, Avalanche Photodiode, PIN photodiode , Block diagram of Fiber- optics Communication system, Repeaters.
III	Data transmission & Telemetry characteristics of Telemetry system, Landline Telemetry, Radio Telemetry.
IV	Frequency Divison Multiplexing, Time Division Multiplexing, Pulse time modulation, Pulse code Modulation, PCM / FM Systems.

Basic Text & Reference Books:

1. Transducers and Instrumentation D.V.S Murthy
2. Radio Engineering (Applied Electronics Vol-II) By : G.K.Mithal
3. Basic Radio & Television By : S.P.Sharma
4. Fundamental of Digital circuits By : A.Anand Kumar