

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2023-24

Annual Teaching Plan

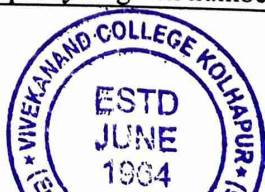
Name of the teacher: Dr. C. B. Patil

Programme: B.Sc. II Semester- III

Subject: Electronics Course Title: DSC-1005C Section-II Microprocessor 8085

Month : July 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Microcomputer Organization:	Components of microcomputer , RAM (SDRAM,DRAM) , ROM Memory Interfacing and Memory Map
6	16	22		
Month : August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Architecture of 8085 Microprocessor: Practicals Group A: 1. To study Amplitude Modulator and demodulator 2. To study FM modulator 3. Pulse Amplitude Modulation (PAM) 4. To study Pulse Width Modulation 5. To study ASK Modulator	features of 8085. Block diagram and Pin description of 8085. Data and address bus, Registers, ALU, Stack pointer, Program counter, Flag register, Clock and reset circuits. Interrupts in 8085. Demultiplexing of AD0-AD7. T-states, Machine cycle, Instruction cycle. Timing diagram of MOV and MVI instructions
12	32	44		
Month: Sept 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-2: Instruction Set of 8085 Microprocessor : Practicals Group A: 6. To study PSK Modulator 7. To study FSK Modulator 8. To study PCM 9. To study PPM 10. Study of Tuned Amplifier Practicals Group C: 1. Addition of Two 8 Bit Numbers 2. Subtraction of Two 8 Bit Numbers 3. Multiplication of Two 8 Bit Num.	classification of Instruction Set, Addressing modes , Instruction set: Data transfer, Arithmetic, logical, branch and control instructions
12	32	44		
Month : Oct 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-3: Programming with 8085 Microprocessor: Practicals Group C: 4. Division of Two 8 Bit Numbers 5. Program to transfer the memory block using 8085 6. Exchange the memory blocks	Programs of Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking, ascending and descending order,
12	32	44		
Month : Nov 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-4: Programming with 8085 Microprocessor: 7. Ascending and descending 8. To find even and odd numbers using 8085 9. To find total number of even and 10. Odd numbers in an array using 8085 11. Programs for masking and to find parity of given number	Time delay generation using register and register pair, Detection of odd and even numbers.
4	12	16		

Dr. C. B. Patil



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DEPARTMENT OF ELECTRONICS
VIVEKANAND COLLEGE

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Department of Electronics

Academic Year: 2023-24

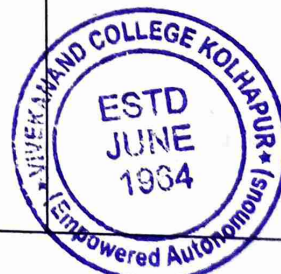
Annual Teaching Plan

Name of the teacher: Dr. C. B. Patil

Programme: B.Sc. II Semester- IV

Subject: Electronics Course Title: DSC-1005D Section-II Microcontroller 8051

Month : Dec 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Introduction to 8051 microcontroller:	features of 8051 family, , Block diagram of 8051,
3	8	11		
Month: Jan 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Introduction to 8051 microcontroller: Practical's Group B (Op-Amp) : 1.To design Op-Amp as Inverting and Non-Inverting amplifier 2.Op-Amp as adder and Subtractor 3.Op-Amp as integrator and differentiator 4.To study Op-Amp as Schmitt trigger. 5.To study Op-Amp as comparator 6.To design phase shift oscillator using Op-Amp	Pin description of 8051, RAM structure of 8051, SFR's and GPR's in 8051,PSW register ,Clock and reset circuit, Memory organization ,I/O Ports.
12	32	44		
Month : Feb 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-2: Instruction Set of 8051: Practical's Group B (Op-Amp): 7.To design Wein bridge oscillator using Op-Amp 8.To study Op-Amp as triangular wave generator 9.Op-Amp as Square wave generator 10. Op-Amp as precision rectifier. 11. Op-Amp as peak detector	Classification of instruction sets, Addressing modes. Instruction set of 8051: Data transfer, Arithmetic, Logical, Jump, Call, Boolean instructions.
12	32	44		
Month : March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-3: 8051 Timer Programming : Practical's Group D: 1.Arithmetic instruction programming 2.Logical instruction programming 3.Bit manipulation instruction 4.Code conversion using 8051 5.Timers of 8051 in mode 1 6.Study of timers of 8051 in mode 2	Introduction to Timers, Timer Registers, Timer modes and Timer Programming using mode 1 and mode 2:- Square wave generation, rectangular wave generation Counter Programming: pulse counter
12	32	44		



Month : April 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-4: 8051 Serial and Interrupt Programming: Practical's Group D: 7. Study of counters of 8051 8. Study of Serial programming 9. Study of Timer Interrupts programming of 8051 10. Study of Serial communication Interrupts programming of 8051 11. Study of External hardware Interrupts programming of 8051	Serial ports: Serial port of 8051, modes, Serial port Registers, Serial port programming. Interrupt: Interrupt in 8051, Interrupt registers, Programming with interrupt
12	32	44		



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Department of ECE
Academic Year: 2023-24
Annual Teaching Plan

Name of the teacher: Dr. C. B. Patil

Programme: B.Sc. III Semester- V

Subject: Electronics

Course Title: DSC-1005E1 Section – II 8051 Microcontroller Interfacing

Month : July 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Introduction to Embedded C	Introduction to Embedded C Advantages and disadvantages of programming in 8051-C & Assembly Language. Data types,
10	5	15		
Month : August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Introduction to Embedded C GROUP A : (Instrumentation-I & II)	Time delay – using for loop and using 8051 Timers, I/O programming, Logical operations, Data conversion programs
12	20	32	1. Design of multi-range ammeter, voltmeter, conversion of ammeter voltmeter 2. Study of temperature sensor RTD 3. Automatic Porch light control using LDR and relay 4. Measurement of displacement - LVDT 5. ON/OFF Temperature controller	
Month: Sept 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-2: Interfacing of Input Output Devices Output devices:: GROUP A: (Instrumentation-I & II)	LED, Relay, Opto-coupler, LCD, Seven Segment Display, Seven Segment Display (multiplexing mode), DC Motor, Stepper Motor Input devices: Switch, 4X4 matrix keyboard, thumb wheel switch
12	20	32	1. Study of solid state relay 2. Function generator using IC 8038 3. Instrumentation amplifier 4. Active filter : Low and High Pass 5. Study of active filter : Band Pass Study of V to F and F to V using VCO	
Month : Oct 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-3: ADC, DAC Interfacing :	Interface ADC 0804, ADC 0808/0809, ADC MAX1112, DAC 0808 (Triangular wave, Ramp, Staircase)
12	20	32	Unit-4: Sensor Interfacing GROUP B: (Antenna)	
			1. Study of simple dipole $\lambda/2$ antenna 2. Study of folded dipole $\lambda/2$ antenna 3. Study of simple dipole $\lambda/4$ antenna 4. Study of Yagi-Uda with 3 and 5 element simple dipole antenna Project work	Reed sensor, smoke sensor, PIR sensor, Temperature sensor (LM 35, PT-100), Humidity sensor (SY HS 230), Light sensor (LDR), Moisture/rain sensor, Gas sensor (MQ series),
Month : Nov 2023			Module/Unit:	Sub-units planned



Lectures	Practicals	Total	Unit-4: Sensor Interfacing GROUP B: (Power Electronics)	AC current sensor (CT-current Transformer), AC voltage sensor (PT-potential transformer), LVDT, Ultrasonic module
12	5	17	6. SCR firing by UJT 7. AC Voltage controller 8. Speed Control of DC Motor. 9. Phase Shift control of SCR 10. Design of Single phase full wave controlled rectifier 11. To study the simulation of single phase HWCW with R & RL load using Project work	



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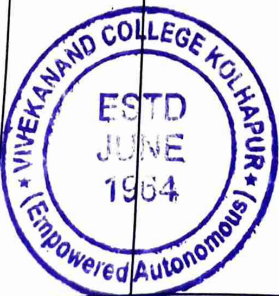
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Department of _____
Academic Year: 2023-24
Annual Teaching Plan

Name of the teacher: **Dr. C. B. Patil**
Programme: B.Sc. III Semester- VI
Subject: Electronics Course Title: **Practicals**


Month : January 2024			Module/Unit:	Sub-unit planned
Lectures	Practicals	Total	Unit 1: Power semiconductor devices GROUP C: (μC 8051 & PLC) 1. Study of Timers in 8051 μC . 2. LED, Switch and Relay interfacing to 8051 μC . 3. LCD Interfacing with 8051 μC 4. DC motor interfacing to 8051 5. Stepper Motor interfacing to 8051 6. DAC0808 interfacing to 8051 7. ADC0804 interfacing to 8051 μC	
0	40	40		
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Thyristors GROUP C: (μC 8051 & PLC) 8. Serial communication with PC using 8051 μC . 9. Study of PLC Simulator 10. Programming with PLC for sequential logic RS-FF, JK-FF 11. Programming with PLC for sequential logic T-FF, D-FF 12. Study of PLC timers and counters	
0	40	40		
Month : March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Controlled Rectifiers Practicals: GROUP D: (AVR & IoT) 13. Interfacing of Switches and LED with Arduino. 14. LCD Interfacing with Arduino 15. Stepper Motor Interfacing with Arduino 16. Interface temperature sensor LM35 with Arduino board 17. Interface temp. sensor & Humidity Sensor (DHT11) with Arduino 18. Accelerometer Sensor Interfacing with Arduino. 19. Study the fundamental of IoT Architecture, Arduino and necessary software	
0	40	40		
Month : April 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: Power Systems Practicals: GROUP D: (AVR and IoT) 11. Interface Bluetooth with Arduino & send the sensor data to smartphone through Bluetooth 12. Interface Bluetooth with Arduino and receive the data from smartphone through Bluetooth to turn LED ON/OFF 13. Interface Wi-Fi module with Arduino to upload sensor data.	
0	40	40		



			14. Interface GSM module with Arduino to upload sensor data 15. Study and implement MQTT protocol using Arduino 16. IoT Application Case study: Home Automation Project work	
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Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: **Mr. P. R. Bagade**


Programme: B.Sc. I Semester- I

Subject: Electronics

IKS: IKS03GEC11: Indian Knowledge System

Month :	Module/Unit:	Sub-units planned
August 2023		
Lectures: 12	Unit 1: Indian Astronomy	Ancient Indian Astronomy, Aryabhata, Astronomers after Aryabhata, Celestial Horizon, Meridian, Pole star and directions, Zodiac and constellations, Zodiac and Rashis, Naksatra system, Civil day and Sideral day, Solar year and Civil calendar, Solar month and lunar month, Yuga system, Indian Eras, Cause of Lunar eclipse, angular diameter of the shadow-cone, Cause of solar eclipse, Angular distance between the sun and the moon at the beginning and end of a solar eclipse.
Month:	Module/Unit:	Sub-units planned
September 2023		
Lectures: 12	Unit 2: Maths in Ancient and Medieval India	Unique Aspects of Indian Mathematics, Number System in India-Historical Evidence, Salient Features of the Indian Numeral System, Concept of Zero and it's Importance, PINGALA and the binary system with Combinatorial Problems in Chandah-Sastra of PINGALA, Great Mathematicians and their Contributions, Property of Right Angle Triangle in Shlba-sutras, The value of π , Magic Square in India
Month :	Module/Unit:	Sub-units planned
October 2023		
Lectures: 12	Unit 3: Chemistry in Ancient and Medieval India	Introduction, Chemistry in pre-Harrapan period, Chemistry in Indus Valley civilization, Chemistry in post-Harrapan period, Chemistry in Vedic and Ayurvedic: Chemistry in Charaka and Sushruta, Chemistry in Tantric Period: Rasaratnakara of Nagarjuna, Iatrochemical period.
Month :	Module/Unit:	Sub-units planned
November 2023		
Lectures: 6	Unit 4: Introduction to Ayurveda.	Ayurvedic medicinal system, Principles of Ayurveda (Vata, Pitta, Kapha), Ayurvedic therapies, Unani system of medicine, Siddha system of medicine, Future of herbal drugs, Study of medicinal plants Punarnava, Vasaka, Shatavar, Brahmi and Arjuna


Mr. P. R. Bagade


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Department of Electronics
Academic Year: 2023-24
Annual Teaching Plan

Name of the teacher: **Mr. P. R. Bagade**

Programme: B.Sc. II Semester- III

Subject: Electronics Course Title: **DSC-1005C Section-I Electronics Communication**

Month : August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1:Electronic Communication Practicals Group A:	Introduction to communication – means and modes, Block diagram of an electronic communication system, Electromagnetic communication spectrum, band designations and usage, Concepts of bandwidth, gain, attenuation, Channels and base-band signals, Concept of Noise, signal-to-noise (S/N) ratio.
12	16	28	1. To study Amplitude Modulator and demodulator 2. To study FM modulator 3. Pulse Amplitude Modulation (PAM) 4. To study Pulse Width Modulation 5. To study ASK Modulator	
Month: September 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Analog Modulation- Demodulation Practicals Group A :	Need, Amplitude Modulation, Mathematical expression, modulation index, frequency spectrum and AM power, Classification of AM, Concept of DSB, SSB generation, Amplitude Demodulation, Phase Modulation (concept only),FM : modulation index & frequency spectrum, equivalence between FM and AM, Generation of FM using VCO, Slope detector, FM Super heterodyne radio receiver
12	16	28	6. To study PSK Modulator 7. To study FSK Modulator 8. To study PCM 9. To study PPM 10. Study of Tuned Amplifier Practicals Group B: 1. Addition of Two 8 Bit Numbers 2. Subtraction of Two 8 Bit Numbers 3. Multiplication of Two 8 Bit Num.	
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Analog Pulse Modulation Practicals Group B :	Unit 3: Channel capacity, Sampling theorem, PAM, PWM, & PPM. Modulation and detection technique for PAM.
12	16	28	4. Division of Two 8 Bit Numbers 5. Program to transfer the memory block using 8085 6. Exchange the memory blocks	
Month : November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: Digital Pulse Modulation:	Need for digital transmission, PCM: Sampling, Quantization and Encoding. ASK, FSK, PSK. Phase Shift Keying (BPSK and QPSK)
12	16	28	7. Ascending and descending 8. To find even and odd numbers using 8085 9. To find total number of even and 10.Odd numbers in an array using 8085 11. Programs for masking and to find parity of given number	

Y.P.D.

Mr. P. R. Bagade



Dr. C. B. Patil

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Annual Teaching Plan

Name of the teacher: **Mr. P. R. Bagade**

Programme: B.Sc. II Semester- IV

Subject: Electronics Course Title: **DSC-1005D Section-I Operational Amplifier**

Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Operational Amplifier Practical's Group B (Op-Amp) : 1. To design Op-Amp as Inverting and Non-Inverting amplifier 2. Op-Amp as adder and Subtractor . 3. Op-Amp as integrator and differentiator 4. To study Op-Amp as Schmitt trigger. 5. To study Op-Amp as comparator 6. To design phase shift oscillator using Op-Amp	Transistor dc amplifier, Emitter coupled Differential amplifier, parameters of Differential amplifier (Ad, Ac, and CMRR), & configurations of differential amplifier. Introduction to op-amp, block diagram of op-amp, electrical parameters of op-amp, offset balancing technique of op-amp, study of IC 741.
12	16	28		
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Applications of Op-amp Practical's Group B (Op-Amp): 7. To design Wein bridge oscillator using Op-Amp 8. To study Op-Amp as triangular wave generator 9. Op-Amp as Square wave generator 10. Op-Amp as precision rectifier. 11. Op-Amp as peak detector	Virtual ground concept, Linear Applications: Op-amp as inverting and non- inverting amplifier, Voltage follower, Op-amp as adder and Subtractor, Non-Linear Applications: Differentiator and Integrator
12	16	28		
Month : March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Oscillators Practical's Group D: 1. Arithmetic instruction programming 2. Logical instruction programming 3. Bit manipulation instruction 4. Code conversion using 8051 5. Timers of 8051 in mode 1 6. Study of timers of 8051 in mode 2	Unit 3: Phase shift oscillator, Wien –bridge oscillator, Triangular wave generator, Square wave generator, Saw tooth wave generator.
12	16	28		
Month : April 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: Comparators and Rectifiers Practical's Group D: 7. Study of counters of 8051 8. Study of Serial programming 9. Study of Timer Interrupts programming of 8051 10. Study of Serial communication Interrupts programming of 8051 11. Study of External hardware Interrupts programming of 8051	Basic comparator, Zero crossing detector, Schmitt trigger ,Peak detector, Clippers (positive and negative) and Clampers (positive and negative) Precision rectifiers: Op-amp as precision rectifiers
12	16	28		

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Mr. P.R. Bagade



Dr. C. B. Patil
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Department of Electronics
Academic Year: 2023-24
Annual Teaching Plan

Name of the teacher: **Mr. P. R. Bagade**

Programme: B.Sc. III Semester-V

Subject: Electronics Course Title: **DSE-1005E2 Section – II Antenna and Wave Propagation**

Month : August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Antenna Theory GROUP A :(Instrumentation-I & II) 1. Design of multi-range ammeter, voltmeter, conversion of ammeter voltmeter 2. Study of temperature sensor RTD 3. Automatic Porch light control using LDR and relay 4. Measurement of displacement -LVDT 5. ON/OFF Temperature controller	Antenna as an element of wireless communication system, Antenna radiation mechanism, current distribution on thin wire antenna. Types of Antennas, Fundamentals of EMFT: Maxwell's equations and their applications to antennas.
12	40	52		
Month: September 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Antenna Parameters GROUP A:(Instrumentation-I & II) 6. Study of solid state relay 7. Function generator using IC 8038 8. Instrumentation amplifier 9. Active filter : Low and High Pass 10. Study of active filter : Band Pass 11. Study of V to F and F to V using VCO	Radiation pattern, Main Lobe and Side Lobes, Half-power beam width, Radiation intensity, Antenna efficiency, Directivity, Gain, effective area, effective length, Bandwidth, Polarization, input impedance, radiation eff.
12	40	52		
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Radiating wire Structures GROUP B: (Antenna) 12. Study of simple dipole $\lambda/2$ antenna 13. Study of folded dipole $\lambda/2$ antenna 14. Study of simple dipole $\lambda/4$ antenna 15. Study of Yagi-Uda with 3 and 5 element simple dipole antenna Project work	Monopole, Dipole, Folded dipole, Yagi-Uda, Loop & Bi-conical broadband Antenna, Microstrip Antennas: Basics and its characteristics, feeding methods, design of rectangular, Concept of smart antenna: Concept, benefits, Fixed weight & Adaptive beamforming basics.
12	40	52		
Month : November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: Radio Wave Propagation GROUP B: (Power Electronics) 16. SCR firing by UJT 17. AC Voltage controller 18. Speed Control of DC Motor. 19. Phase Shift control of SCR 20. Design of Single phase full wave controlled rectifier 21. To study the simulation of single phase HWCW with R & RL load using Project work	Different Modes of Wave Propagation, Structure of atmosphere, Ground wave, Space Wave propagation. Sky Wave Propagation - Introduction, Structure of Ionosphere, Refraction and Reflection of Sky Waves by Ionosphere, Ray Path, Critical Frequency, MUF, Virtual Height and Skip Distance, Relation between MUF and skip Distance, Multi-hop Propagation.
12	40	52		

PRB
Mr. P. R. Bagade



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Department of Electronics

Academic Year: 2023-24

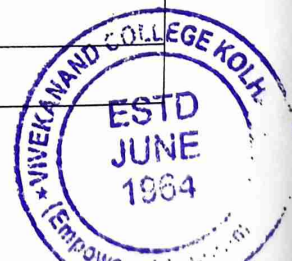
Annual Teaching Plan

Name of the teacher: **Mr. P. R. Bagade**

Programme: B.Sc. III Semester- VI

Subject: Electronics Course Title: **DSF-1005F2 Section – I Power Electronics**

Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Power semiconductor devices	Definition, Need- semiconductor power devices, classification of power semiconductor devices, Power diode: structure, operation, conductivity modulation, I-V characteristics, Reverse recovery effect, series and parallel connection of diode, Power transistor: structure, operation, effect of drift layer. specifications, Power MOSFET : MOSFET structure, characteristics, operation and drive circuits
12	40	52	GROUP C: (μC 8051 & PLC) 1. Study of Timers in 8051 μ C. 2. LED, Switch and Relay interfacing to 8051 μ C. 3. LCD Interfacing with 8051 μ C 4. 4.DC motor interfacing to 8051 5. Stepper Motor interfacing to 8051 6. DAC0808 interfacing to 8051 7. ADC0804 interfacing to 8051 μ C	
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Thyristors	Types of Thyristors, Structure of SCR, SCR Characteristics, two transistor analogy - Methods of turning ON and turning OFF, dv/dt and di/dt protection, gate protection circuits Diac and Triac: Basic structure, working and V-I characteristic.
12	40	52	GROUP C: (μC 8051 & PLC) 8. Serial communication with PC using 8051 μ C. 9. Study of PLC Simulator 10. Programming with PLC for sequential logic RS-FF,JK-FF 11. Programming with PLC for sequential logic T-FF,D-FF 12. Study of PLC timers and counters	
Month : March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Controlled Rectifiers	Basics of single and three phase supply phase and line voltage waveforms, SCR as a static switch, phase controlled rectification, single phase half wave, full wave, bridge rectifiers with resistive & inductive loads.
12	40	52	Practicals: GROUP D: (AVR & IoT) 13. Interfacing of Switches and LED with Arduino. 14. LCD Interfacing with Arduino 15. Stepper Motor Interfacing with Arduino 16. Interface temperature sensor LM35 with Arduino board 17. Interface temp. sensor & Humidity Sensor (DHT11) with Arduino 18. Accelerometer Sensor Interfacing with Arduino. 19. Study the fundamental of IoT Architecture, Arduino and necessary software	
Month : April 2024			Module/Unit:	Sub-units planned



Lectures	Practicals	Total		
12	40	52	Unit 4: Power Systems Practicals: GROUP D: (AVR and IoT) 11. Interface Bluetooth with Arduino & send the sensor data to smartphone through Bluetooth 12. Interface Bluetooth with Arduino and receive the data from smartphone through Bluetooth to turn LED ON/OFF 13. Interface Wi-Fi module with Arduino to upload sensor data. 14. Interface GSM module with Arduino to upload sensor data 15. Study and implement MQTT protocol using Arduino 16. IoT Application Case study: Home Automation Project work	Power Supplies: Switch mode power supply (DC): flyback, forward, half bridge and full bridge converters. Uninterrupted power supply (UPS), Electronic Ballast, Power factor correction.

Y.P.R.

Mr. P.R. Bagade

C.B.P.

Dr. C. B. Patil

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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: **Dr. P. S. Jadhav**


Programme: B.Sc. I Semester- I


Subject: Electronics Course Title: **DSC-II Course Code: DSC03ELE12 Digital Electronics-I**

Month : July 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lecture: Unit 1: Number System, Binary Codes and Binary Arithmetic	Decimal, Binary, Octal and Hexadecimal number systems and their inter conversions. BCD code. ASCII code, Gray Code, Excess-3 Code, Binary Arithmetic: Addition, Subtraction by 1's complement and 2's complement method, Representation of signed and unsigned numbers
20	40	60	Practical's: 1. To familiarize with basic electronic components (R, C, L, diodes, transistors), Digital Multimeter, Function Generator, power supplies and Oscilloscope etc. 2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope 3. Verification of Kirchhoff's Laws	
Month: August 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lectures : Unit 2: Logic Gates, Boolean algebra:	Study of logic Gates: OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Boolean identities and Law's. Fundamental, theorems of Boolean algebra. Standard representation of logic functions (SOP and POS),
20	40	60	Practicals: 1. Verification of Thevenin's Theorem. 2. Verification of Norton's Theorem 3. Verification of Superposition Theorem	
Month: September 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lectures : Unit 2: Logic Gates, Boolean algebra:	Minimization Techniques (Karnaugh map minimization up to 4 variables for SOP). Arithmetic Circuits: Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor.
20	40	60	Practicals: 1. Study of the I-V Characteristics of P-N junction Diodes 2. Study of the a) breakdown Characteristics of Zener Diode b) Zener Diode as voltage regulator. 3. Study of Half wave and Full wave rectifier (centre tapped transformer/bridge)	
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 3: Logic Families	Logic Families: Types of



20	40	60	<ol style="list-style-type: none"> 1. Study of IV Characteristics of JFET 2. Study of Input, Output and transfer Characteristics of CE configuration of BJT 3. Study of Voltage divider bias circuit for CE mode 	Logic Families, Characteristics of Logic Families, TTL NAND gate, TTL NOR gate, TTL NOT gate, Concept of Tristate Logic, MOS Technology, CMOS: NOR, NAND and NOT gates, Comparison of TTL and CMOS logic families
Month : November 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 4: Combinational circuits: Practicals:	Multiplexers: - 2 to 1, 4 to 1 and 8 to 1. Demultiplexer: - 1 to 2, 1 to 4, 1 to 8. Encoder: concept of encoder, Decimal to BCD Encoder. Basic Binary decoders: 2 to 4 line, 3 to 8 line and 4 to 16 line, BCD to decimal decoder, Study of BCD to seven-segment decoder driver IC 7447.
20	40	60	<ol style="list-style-type: none"> 1. Transistor as a switch 2. Study of the RC Phase Shift Oscillator 3. Study of the Wein Bridge Oscillator 4. Study of the Colpitt's oscillator 5. Study of the Hartley oscillator 	


Dr. P. S. Jadhav


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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: **Dr. P. S. Jadhav**

Programme: B.Sc. I Semester- II

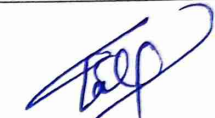
Subject: Electronics Course Title: **DSC-IV Course Code: DSC03ELE22 Digital Electronics-II**

Month: November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Sequential Circuit Practical: Group B	Concept of Flip-flop, RS, D and JK Flip-Flops Concept of Clock, Level and Edge Triggered RS, D, JK FF
10	20	30	1. Study of Logic Gates 2. Study of Universal NAND Gate 3. Study of Universal NOR Gate	
Month : December 2023			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 1: Sequential Circuit	Preset and Clear operations. Race-around conditions in JK Flip-Flop, Master-slave JK Flip-Flop, T-Flip-flop.
20	40	60	Unit 2: Shift registers and counters Practical: 1. Study of De-Morgans Theorems Study of Half Adder and Full Adder 2. Study of Half and Full Subtractor 3. Study of BCD to seven segment Decoder	
Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 2: Shift registers and counters Practical:	Counters: classification of counters, Asynchronous counters: 3 bit ripple counter, Decade Counter. Synchronous Counter: 3 bit and decade synchronous counter. Ring Counter and Johnson Counter .Applications of Counters.
20	40	60	1. Study of Encoder 2. Study of Multiplexer (4:1) and Demultiplexer (1:4) using IC 3. Building and testing of RS Flip-Flop using NAND/NOR gate.	
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 3: Data Converters Practical:	4bit binary weighted and R-2R ladder network DAC: circuit and working.DAC Characteristics: Accuracy and Resolution.
20	40	60	1. Building and testing D and JK Flip-Flop using IC 2. Construction and study of Shift Register (serial-in and serial-out) 3. Using D-type/JK Flip-Flop IC	
Month: March 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 3: Data Converters	ADC: Flash, Countertype, successive approximation ADC, ADC Characteristics..
20	40	60	1. Study of 3-bit Asynchronous counter Design and study of 4 bit digital to analog converter using R-2R ladder network. 2. Design and study of an Astable Multivibrator using IC 555Timer.	

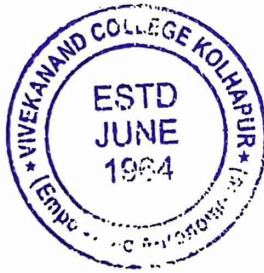


Month: April 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 4: Study of Timer IC555 1. Design and study of a Monostable Multivibrator using IC555Timer. 2. Design and study of a Bistable Multivibrator using IC555Timer.	IC555timer: Introduction, Block diagram, Astable, Monostable and Bistable multivibrator circuits
20	40	60		
Month: May 2024			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 4: Study of Timer IC555 1. Transistor as Switch 2. Kirchoff's Laws	Applications of IC555: PWM, square wave generator and FSK
8	10	18		


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Programme: B.Sc. I Semester- II

Subject: Electronics Course Title: SEC-I: SEC03ELE21: Circuit simulation Lab

Month: November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals 1. Determining the equivalent resistance of series resistors and parallel resistors 2. Study of Voltage Divider rule and Current Division rule 3. Verification /Validation of Kirchhoff's Current law and Kirchhoff's Voltage law 4. Verification/ Validation of Thevenin's theorem	
0	10	10		
Month : December 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	5. Verification/ Validation of Superposition theorem 6. Verification/Validation of Norton's theorem 7. Investigation of P-N Junction diode characteristics 8. Study of Zener Voltage Regulator	
0	20	20		
Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	9. Study of Half Wave Rectifier Circuit 10. Study of Full Wave rectifier Circuit with C filter/ π filter 11. Study of Transistor as Switch 12. Study of Common Emitter Characteristics	
0	20	20		
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	13. Design and assemble Single stage CE amplifier 14. Study of JFET Characteristics 15. Study of Hartley Oscillator/Colpitt's Oscillator 16. Study of the RC Phase Shift Oscillator	
0	20	20		
Month: March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total		



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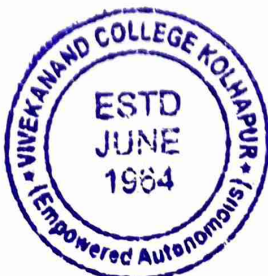
Programme: B.Sc. III Semester- V

Subject: Electronics

Course Title: **Practicals**

Month : July 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals: GROUP C: (Microcontroller 8051 & PLC) 1. Study of Timers in 8051 Microcontroller. 2. LED, Switch and Relay interfacing to 8051 microcontroller. 3. LCD Interfacing with 8051 Microcontroller. Project work	
0	40	40		
Month: August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals: Group B : (Antenna and Power Electronics) 4. DC motor interfacing to 8051 microcontroller. 5. Stepper Motor interfacing to 8051 microcontroller. 6. DAC0808 interfacing to 8051 microcontroller. 7. ADC0804 interfacing to 8051 microcontroller. Project work	
0	40	40		
Month : September 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals: 8. Serial communication with PC using 8051 microcontroller GROUP D: (AVR and IoT) 1. Interfacing of Switches and LED with Arduino/AVR microcontroller. 2. LCD Interfacing with Arduino/AVR microcontroller. 3. Stepper Motor Interfacing with Arduino/AVR microcontroller.	
0	40	40		
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals: 4. Interface temperature sensor LM35 with Arduino board and display temperature on LCD. 5. Interface temperature sensor and Humidity Sensor (DHT11) with Arduino/AVR board and display temperature and humidity values on LCD. 6. Accelerometer Sensor Interfacing with Arduino/AVR microcontroller. 7. Study the fundamental of IOT Architecture, Arduino and necessary software and create the thingspeak account. 8. Interface Bluetooth with Arduino and send the sensor data to smartphone through Bluetooth.	
0	40	40		

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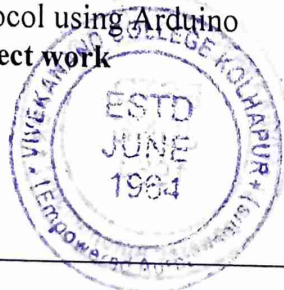
Annual Teaching Plan

Name of the teacher: **Dr. Milind S. Patil**

Programme: B.Sc. III Semester- VI

Subject: Electronics Course Title: **DSE1005 F1 Section II Advanced Microcontroller**

Month: December 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Embedded Systems Design: 2) Introduction to AVR microcontroller:	1) What is embedded system, embedded system basic blocks, embedded system hardware and software, embedded system characteristics, embedded system applications. 2) Overview of AVR family, ATmega8 pin configuration & function of each pin. AVR Microcontroller architecture, status register, Special function registers, SRAM, ROM & EEPROM space, On-Chip peripherals.
12	40	52	Practicals: Group D : (AVR and IoT) 9. Interface Bluetooth with Arduino and receive the data from smartphone through Bluetooth to turn LED ON/OFF. 10. Interface wifi module with Arduino to upload sensor data to thingspeak cloud. 11. Interface wifi module with Arduino to retrieve data from thingspeak cloud. Project work	
Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) AVR programming in C:	3) AVR Data types, AVR I/O port programming, Timer programming, Input capture and Wave Generator, PWM programming, External Interrupt programming, ADC programming, Serial Port programming.
12	40	52	4) Peripheral interfacing and embedded system:	
			Practicals: Group D : (AVR and IoT) 12. Interface GSM module with Arduino to upload sensor data to thingspeak cloud 13. Read the sensor data and upload the data to thingspeak cloud using NodeMCU 14. Study and implement MQTT protocol using Arduino Project work	4) Interfacing of Switches, Relays, LEDs, seven segment display 16x2 LCD Interfacing, Stepper interfacing.



Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	5) Designing of an Embedded System:	5) DC Motor speed control using PWM technique, Measurement of Temp. of an environment using sensor LM35, Dual channel Digital Voltmeter.
12	40	52		
Month: March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals: Group D : (AVR and IoT) 15. IoT Application Case study: Home Automation Project work	
12	40	52		

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Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: **Dr. Milind S. Patil**

Programme: B.Sc. III Semester- VI

Subject: Electronics Course Title: **SEC 4: Embedded System Design using Arduino**

Month : December 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) Display Interfacing	Interfacing Arduino to LED's- blinking single LED, blinking multiple LED's, 7 segment display
6	0	6		
Month: January 2024			Module/Unit:	Sub-units planned
6	0	6	3) Display Interfacing	traffic light, LED flashes, LED dot matrix, Interfacing to LCD's- Basic LCD control, display a message on LCD display
Month : February 2024			Module/Unit:	Sub-units planned
6	0	6	4) Interfacing sensors:	Sensors- Definition, Types. Interfacing Arduino to different sensors- light sensor, temperature sensor, humidity sensor,
Month : March 2024			Module/Unit:	Sub-units planned
6	0	6	4) Interfacing sensors:	Pressure sensor, sound sensor, distance ranging sensor, water/detector sensor, smoke, gas, alcohol sensor, ultrasonic range finder.

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Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: Mr. G. B. Jirage

Programme: B.Sc. I Semester- I

Subject: Electronics Course Title: ANALOG ELECTRONICS-I

Month : August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1:Basic Circuit Elements Practicals: Group A : (LIC & PLC) 1. Instrumentation amplifier using OPAMP 2. Precision rectifier using OPAMP 3. Log amplifier using OPAMP	Study of basic circuit elements and passive components: Resistor, Capacitor, Inductor, Transformer, Relays, Switches (working principle, circuit symbols, types, specifications and applications
12	20	32		
Month: September 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-2:Circuit Analysis: Practicals: Group A : (LIC & PLC) 4. Study of active filter : Low and High pass 5. Study of active filter : band pass 6. Study of V to F and F to V using PLL.	Concept of Voltage and Current Sources, Internal resistance, Kirchhoff's Current. Kirchhoff's Voltage Law, Mesh Analysis, Node Analysis, Principle of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem.
12	20	32		
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-3:PN Junction Diode: Practicals: Group A : (LIC & PLC) 7. Study of PLC Simulator and implementing Boolean function 8. Programming with PLC for sequential logic RS -FF,JK-FF,T-FF,D-FF 9. Study of PLC timers and counters in PLC	Construction of PN junction, Formation of Depletion Layer, Barrier potential, Forward and Reverse bias, Diode Equation and I-V characteristics, Zener diode, Zener and Avalanche breakdown, Zener diode specifications. Photo diode. Light Emitting Diode (LED): construction and working, 7-segment display and it's applications
12	20	32		
Month : November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-4:DC Power Supply	Need of PowerSupply, Block diagram of DC regulated power supply, Rectifiers: Halfwave, Fullwave rectifiers (center tapped and bridge):- Circuit diagrams, working and waveforms Zener diode as voltage regulator, Three pin IC regulators: Block diagram, Specifications and applications. Fixed and Variable voltage IC regulator
12	20	32		



Mr. G. B. Jirage

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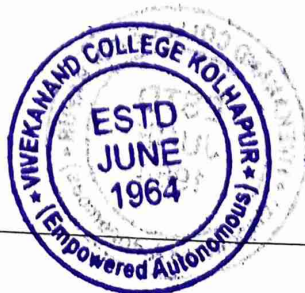
Annual Teaching Plan

Name of the teacher: Mr. G. B. Jirage

Programme: B.Sc. I Semester- II

Subject: Electronics **Course Title: ANALOG ELECTRONICS-II**

Month : January 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-1: Bipolar Junction Transistor Practicals: Group A : (LIC & PLC) 1. Instrumentation amplifier using OPAMP 2. Precision rectifier using OPAMP 3. Log amplifier using OPAMP	BJT: Introduction, Structure, Working of transistor. Transistor configurations: CB, CE and CC configurations, characteristics of transistor in CE and CB configurations, Regions of operation (active, cut off and saturation), Current gains α and β . Relations between α and β , dc load line and Q point.
12	20	32		
Month: February 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-2: Unipolar Devices Practicals: Group A : (LIC & PLC) 4. active filter : Low and High pass 5. Study of active filter : band pass 6. V to F and F to V using PLL.	JFET: Construction, working and I-V characteristics (output and transfer), MOSFET: Construction, working and I-V characteristics (output and transfer).UJT: introduction, structure and characteristics.
12	20	32		
Month : March 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-3 Amplifiers: Practicals: Group A : (LIC & PLC) 7. Study of PLC Simulator and implementing Boolean function 8. Programming with PLC for sequential logic RS -FF,JK-FF,T-FF,D-FF 9. Study of PLC timers and counters in PLC	Need of transistor Biasing, Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor S., Class A, B, AB and C Amplifiers Single stage CE amplifier: Current gain, Voltage gain, Power gain, input and output resistances, frequency Response. Cascaded Amplifiers: Two stage RC, LC, TC and DC Coupled Amplifiers
12	20	32		
Month : April 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit-4: Feedback Amplifier and Oscillators:	Concept of feedback, negative and positive feedback, advantages of negative feedback (Qualitative only). Oscillators: Barkhausen criterion for sustained oscillations. Phase shift, Wein Bridge, Hartley and Colpitt's oscillator .UJT as relaxation oscillator.
12	20	32		



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Department of Electronics

Name of the teacher: Mr. G. B. Jirage

Programme: **B.Sc. I Semester-I**

Subject: Electronics Course Title: **OEC-I: Course Code: OEC03 ELE11: CIRCUIT FUNDAMENTALS-I**

Month : July 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit1: Electricity	Introduction, Electric current, Electrical resistance, conductance and conductivity, open and short circuit, Direct Current, Alternating current, Ohm's law, electrical energy, electrical Power, power dissipation in resistance
12	0	12		
Month: August 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: D.C. circuit	Introduction, current direction and voltage polarity of circuit components, voltage notation, resistances in series, Voltage division rule, resistances in Parallel, Total power in series and parallel circuits, series parallel circuits.
12	0	12		
Month: September 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Kirchhoff's Laws and Theorems	Kirchhoff's laws- Kirchhoff's voltage and current law, Thevenin's theorem, Superposition theorem, Norton's theorem
12	0	12		
Month : October 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: AC fundamentals	Introduction, types of alternating current or voltage, terms related to AC- cycle, time period , frequency, Amplitude (Peak value),
12	0	12		
Month : November 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: AC fundamentals	Peak to peak values, Instantaneous value, RMS value, Average value, concept of phase difference, Harmonics
12	0	12		


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Department of Electronics

Academic Year: 2023-24

Annual Teaching Plan

Name of the teacher: Mr. G. B. Jirage

Programme: B.Sc. I Semester- II

Subject: Electronics Course Title: **OEC-III OEC03ELE21 Circuit Fundamentals-II**

Month: December 2024			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Passive circuit elements-I:	Introduction, resistors- specifications, classification of resistors, construction of carbon composition resistors, wire wound resistors, film resistors, variable resistors: potentiometers, rheostat, thermistors, colour code system for resistor, Capacitor: concept of capacitance, types of capacitors.
12	00	12		
Month : January 2024			Module/Unit:	Sub-units planned
12	00	12	Unit 2: Passive circuit elements-II	Introduction, inductors, Concept of self-inductance, construction and types of inductors. concept of mutual inductance , construction and working of transformer, types of transformers, Wires: different types of wires
Month: February 2024			Module/Unit:	Sub-units planned
12	0	12	Unit 3: Circuit controllers	Introduction, switch, switch action, types of switches, commercially available switches, fuses, fuse ratings, circuit breaker, relays: electromagnetic relay construction and working
Month: March 2024			Module/Unit:	Sub-units planned
12	0	12	Unit 4: Voltage and Current sources	Introduction, batteries, regulated DC supplies, solar cell, generators, oscillators and signal generators, internal resistance of source, concept of voltage source, ideal and practical voltage sources. concept of current source, ideal and practical current sources.



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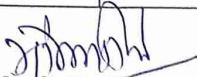
Programme: B.Sc. III Semester- V

Subject: Electronics Course Title: **DSE 1005E2 Industrial Process Control**

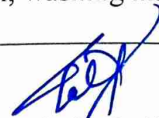
Month : July 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Introduction of control system	1) Significance Transfer Function, Types and order of transfer function (Open loop and Close loop transfer system), Block diagram of Control System and reduction rules, Basic elements of control system, open loop controlsystem, closed loop control system, control system terminology, manually controlled closed loop systems, automatic controlled closed loop systems, comparison closed-loop system and open-loop control, feed-forward control system, adaptive control system, classification of control system.ON-OFF controller, proportional control, PI controller, PD controller andPID control. Introduction to Fuzzy Controller 2) Op-amp as a zero crossing detector, non-inverting comparator, inverting comparator, two position control using op-amp, proportional controller, integral controller using Op-amp , derivative controller, PI controller, PID controller.
12	0	12	Unit2: Components of Control System	
Month:August 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3 :Introduction to PLC Practicals:	Programmable logic controller (PLC) basics: Definition, overview of PLC systems, block diagram of PLC, input/output modules, power supplies, isolators, features like scan time, system scale, user interface. Modular PLC and Redundant PLC and Applications. Industrial Communication Buses: RS485, Profibus .Distributed control system, DCS components/block diagram, SCADA, adaptive control system.
12	0	12		
Month : Sept 2023			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4 :Ladder Programming basics	4) Basic components: fuse, pushbutton, selector switches, limit switches, indicators, relay, timedelay relays functions and symbols. General PLC programming procedures. Ladder logic on-off inputs/ outputs.
12	0	12		
Month : October 2023			Unit 4 :Ladder	Auxiliary



12	0	12	Programming basics	commands and functions: PLC Basic Functions: Register basics, timer functions, counter functions. Ladder Programming: Programs for Boolean logic and flip-flops, counters, timers, flasher. Application program Bottle filling plant, elevator control, washing machine control.
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