Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Academic Year: 2021-22

Annual Teaching Plan

Name of the teacher: Dr. C. B. Patil
Programme: B.Sc. I   Semester- II
Subject: Electronics   Course Title: DSC-1005B Section- I Analog Electronics-II

Month: March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Bipolar Junction Transistor:	BJT: Structure, Working of transistor. Transistor configurations: CB, CE and CC, characteristics of transistor in CE and CB configurations, Current gains α and β, dc load line and Q point
10	0	10		
			2) Unipolar Devices:	JFET: Construction, working and I-V characteristics MOSFET: Construction, working and I-V characteristics , UJT: introduction, structure and characteristics.
Month : April 2022			Module/Unit:	Sub-units planned
10	0	10	3) Amplifiers:	Transistor biasing - Fixed Bias and Voltage Divider Bias, Class A, B, AB and C Amplifiers, Single stage CE amplifier, Cascaded Amplifiers: Two stage RC, LC, TC and DC Coupled Amplifiers ,Concept of Differential amplifier and its advantages.
Month: May 2022			Module/Unit:	Sub-units planned
10	0	10	4) Feedback Amplifier and Oscillators:	negative and positive feedback, Oscillators: Barkhausen criterion for sustained oscillations, Phase shift, Wein Bridge, Hartley and Colpitt's oscillator ,UJT as relaxation oscillator

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1

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22

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 : November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Microcomputer Organization: 2) Architecture of 8085 Microprocessor:	1) Components of microcomputer, RAM (SDRAM,DRAM) , ROM Memory Interfacing and Memory Map
12	32	44		
			Practicals Group A: 1. To design an Amplitude Modulator using Transistor/ Op-amp 2. To study envelope detector for demodulation of AM signal 3. To study FM - Generator / Detector 4. To study AM Transmitter / Receiver 5. To study FM Transmitter /Receiver	2) 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

Month: December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) Instruction Set of 8085 Microprocessor : **Practicals Group A:** 6. To study Time Division Multiplexing (TDM) 7. To study Pulse Amplitude Modulation (PAM)8. To study Pulse Width Modulation (PWM) 9. To study Pulse Position Modulation (PPM) 10. To study ASK modulator	3) classification of Instruction Set, Addressing modes , Instruction set: Data transfer, Arithmetic, logical, branch and control instructions
12	32	44		

Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	4) Programming with 8085 Microprocessor: **Practicals Group A:** 11. To study PSK modulator 12. To study FSK modulator **Practicals Group B:** 1. Addition and subtraction of numbers using direct addressing mode 2. Addition and subtraction of numbers using indirect addressing mode 3. Multiplication by repeated addition 3. Multiplication by repeated addition	4) Programs of Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking, ascending and descending order, Time delay generation using register and register pair, Detection of odd and even numbers.
12	32	44		

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2

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2021-22

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 : March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Introduction to 8051microcontroller: 2) Instruction Set of 8051:	1) features of 8051 family, Block diagram of 8051, 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		
			Practicals Group B: 4. Division by repeated subtraction 5. Addition of 16-bit Numbers. 6. Use of CALL and RETURN Instruction. 7. Block data handling	2) Addressing modes . Instruction set of 8051: data transfer, arithmetic, Logical, Jump, call, Boolean instructions
Month: April 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) Timers, Serial port and Interrupts(Assembly)programming of 8051: **Practicals Group C:** 1. Arithmetic operation using 8051 2. Logical operations using 8051 3.Study of timers of 8051 in mode 1 and mode 2 4.Study of interfacing of LED to 8051 microcontroller. 5.Study of interfacing of LED array	3) Timers in 8051,Timer Registers, modes and Programming of timers, Serial ports: Serial port of 8051, modes, Registers Serial port, Serial port programming., Interrupt: Interrupt in 8051, Interrupt registers, Programming with interrupt
12	32	44		
Month : May 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	4) Interfacing of Devices with 8051: **Practicals Group C:** 6.Study of rotate instruction 7.Study of interfacing of 7-segment display 8. Study of interfacing Multiplexed 7-segment display. 9. Study of interfacing of stepper motor. 10. Study of interfacing of D.C motor.	4) Introduction to embedded C, Data types in C, SFR accessing , I/O programming, logical operations in C. Program to generate square wave on port pin, Interfacing of LED, Opto-coupler, Switch, Relay, DC motor and Stepper motor
12	32	44		

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Vivekanand College, Kolhapur.

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22

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 and Embedded C**

Month : November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Introduction to embedded C 2) Real World Interfacing of 8051	1) Data types, operators and loops, I/O programming, Accessing SFR, Logical operation. Data conversion programs, Accessing ROM space, programming for Time delay generation (using timer), external interrupts
12	40	52		
			Practicals: **Group A : (LIC & PLC)** 1. Instrumentation amplifier using OPAMP 2. Precision rectifier using OPAMP 3. Log amplifier using OPAMP **Project work**	2) Interfacing to output devices – LED, Relay, LCD, seven segment display, DC Motor, Stepper Motor.Interfacing to input devices – Switch, 4X4 matrix keyboard, opto-coupler, thumb wheel switch. Interfacing of DAC0808 and ADC0804.
Month: December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) Serial communication in 8051	3) RS-232 standard and IC MAX–232, Concept of Baud rate, SBUF register, SCON register, programming for data transmission and reception.
12	40	52	**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. **Project work**	
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	4) Applications of 8051	4) i) Gate Emulator (Logic Gate study using microcontroller) ii) Water level controller iii) speed control of DC motor iv) Temperature measurement using LM35, ADC0804, LCD. v)Bluetooth module interfacing. Vi) Speed control of Stepper Motor
12	40	52	**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 **Project work**	

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4

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22

Annual Teaching Plan

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

Month : March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group C: (Microcontroller 8051 & FPGA)**	
0	40	40	1. Arithmetic and logical operations using 8051microcontroller. 2. Switch and Relay interfacing to 8051 microcontroller 3. DC motor interfacing to 8051microcontroller 4. Study of Timers in 8051 Microcontroller 5. Stepper Motor interfacing to 8051 microcontroller 6. DAC0808 interfacing to 8051microcontroller **Project work**	
Month: April 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group C: (Microcontroller 8051 & FPGA)**	
0	40	40	7. ADC0804 interfacing to 8051microcontroller. 8. Serial communication with PC using 8051microcontroller. 9. Write VHDL code to realize basic and derived logic gates. 10. Write VHDL code to realize Half adder, Full Adder using basic and derived gates. 11. Write VHDL code to realize Half subtractor and Full Subtractor using basic and derived gates **Project work**	
Month : May 2022				Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group C: (Microcontroller 8051 & FPGA)**	
0	40	40	12. Design and simulation of a 4 bit Adder using VHDL. 13. Write VHDL code to realize Multiplexer (4x1) and Demultiplexer(1x4) using logic gates. 14. Write VHDL code to realize Decoder and Encoder using logic gates. 15. Write VHDL code to realize Clocked D, JK and T Flip flops (with Reset inputs) 16. Write VHDL code to realize 3-bit Ripple counter **Project work**	

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5

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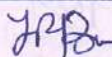Department of Electronics

Academic Year: 2021-22

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 : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1:Electronic Communication Practicals Group A:	Introduction to communication- meaning and types, Block diagram of an electronic communication system. Brief idea of frequency allocation for radio communication system in India (TRAI). Electromagnetic communication spectrum, band designations and usage. Channels and base band signals, concept of Noise, signal-to-noise (S/N) ratio.
12	32	44	1. To design an Amplitude Modulator using Transistor. 2. To study envelope detector for demodulation of AM signal 3. To study FM - Generator / Detector 4. To study AM Transmitter / Receiver 5. To study FM Transmitter /Receiver 6. To study TDM. 7. Pulse Amplitude Modulation 8. To study Pulse Width Modulation	
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Analog Modulation- Demodulation Practicals Group A:	Need for modulation, Amplitude Modulation (AM) modulation index and frequency spectrum. Concept of DSB,SSB generation. Amplitude Demodulation (diode detector). PM: Concept only,
12	32	44	9. To study Pulse Position Modulation 10.To study ASK modulator 11.To study PSK modulator 12.To study FSK modulator	
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Modulation- Demodulation Practicals Group B:	Frequency Modulation (FM), modulation index and frequency spectrum, equivalence between FM and AM. Generation of FM using VCO, FM detector (Slope detector), and Study of Super heterodyne radio receiver.
12	32	44	1. Addition and subtraction of numbers -direct addressing 2. Addition and subtraction of numbers -indirect addressing mode 3. Multiplication by repeated addition. 4. Division by repeated subtraction	
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Satellite communication Practicals Group B:	Introduction, Need, Geosynchronous satellite orbits, geostationary satellite, advantages of geostationary satellite. Satellite visibility, transponders (C- Band), path loss, ground station, simplified block diagram of earth station. Uplink and down link.
12	32	44	5. Addition of 16-bit Numbers. 6. Use of CALL and RETURN Instruction. 7. Block data handling	

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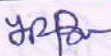Academic Year: 2021-22
Annual Teaching Plan

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

Programme: B.Sc. II   Semester- IV
Subject: Electronics   Course Title: DSC-1005D Section-I Advance Communication

Month : March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Unit 1:Analog Pulse Modulation** Practicals Group C:	Channel capacity, Sampling theorem, Basic Principles-PAM, PWM, PPM, modulation and detection technique for PAM only.
12	32	44	1. Arithmetic operation using 8051 2. Logical operations using 8051 3. Study of timers of 8051(mode 1& 2) 4. Interfacing of LED to 8051. 5. Study of interfacing of LED array 6. Study of rotate instruction 7. Study of interfacing of 7-segment 8. Study of interfacing multiplexed 7-segment display	
Month: April 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Unit 2: Digital Pulse Modulation** Practicals Group C:	Need for digital transmission, Pulse Code Modulation, Digital Carrier Modulation Techniques, Sampling, Quantization and Encoding. Concept of Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and (BPSK and QPSK).
12	32	44	9. Interfacing of stepper motor. 10. Study of interfacing of D.C motor. Practicals Group D: 1. Designing of PCB using Software 2. Development of PCB 3. Soldering techniques 4. Temperature Controller using IC 741 /8051.	
Month : May 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Unit 3: Mobile Telephony System** Practicals Group D:	Basic concept of mobile communication, frequency bands used in mobile communication, concept of cell sectoring and cell splitting, Hand-off process, SIM number, IMEI number.
12	32	44	5. Designing of Variable Power Supply using LM 317. 6. Build Regulated Power Supply using IC 7805 7. Build Dual Power Supply using IC 7809 and IC 7909	
Month : June 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Practicals Group D, 8. Assemble Electric Board with switches, sockets and MCB and measure Voltage, Current and Power for given device 9. Study and fault finding of: Fan /Iron/ Mixer/Cell phone Charger 10.Build Lighting system using LED,	Architecture (Block diagram) of mobile communication network, idea of GSM, CDMA, TDMA and FDMA technologies, simplified block diagram of mobile phone handset, 2G, 3G and 4G concepts (qualitative only). GPS navigation system.
12	32	44		

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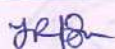Academic Year: 2021-22

Annual Teaching Plan

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

Programme: B.Sc. III Semester-V

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

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: **Antenna Basics**	Antenna: Function of antenna. Radiation Mechanism.
12	40	52	GROUP A : (LIC & PLC) 1. Instrumentation amplifier 2. Precision rectifier using OPAMP 3. Log amplifier using OPAMP 4. Active filter : Low and High pass 5. Study of active filter : band pass 6. Study of V to F and F to V.	Antenna Parameters: Radiation pattern, Main Lobe and Side Lobes, Half-power beamwidth, Radiation intensity, Antenna efficiency, Directivity, Gain, BW, Polarization, input impedance, radiation efficiency.
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: **Antenna as a Transmitter**	Power delivered to antenna, Input impedance. Radiation
12	40	52	GROUP A : (LIC & PLC 7. Study of PLC Simulator and implementing Boolean function 8. Programming with PLC for sequential logic RS ,JK-FF,T,D-FF 9. Study of timers and counters in PLC	from an infinitesimal small current element, Radiation from an Hertzian dipole, Reactive, Induction and Radiation fields, radiation resistance for small current element.
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: **Radiating wire Structures**	Monopole, Dipole, Folded dipole, Loop antenna and
12	40	52	GROUP B: (Antenna and Power Ele) 1. Study of simple dipole λ/2 antenna 2. Study of folded dipole λ/2 antenna 3. Study of simple dipole λ/4 antenna 4. Study of Yagi- Uda with 3 and 5 ele. 5. Study of SCR characteristics 6. Study of AC / DC Timer 7. SCR firing by UJT 8. AC Voltage controller 9. Speed Control of DC Motor	Biconical broadband Antenna. Basics of Patch Antenna and its design. Examples of Patch antenna like bowtie, sectoral, fractal. Concept of smart antenna.
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: **Radio Wave Propagation**	Structure of atmosphere, Ground wave, Space Wave,Sky Wave
12	40	52	GROUP B: (Antenna and Power Electronics) 10.ON/OFF Temperature controller 11.Phase Shift control of SCR 12.Simulation of single phase half wave controlled rectifier with R & RL 13.Simulation of single phase HW controlled bridge rectifier with R.	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

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Department of Electronics

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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22
Annual Teaching Plan

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

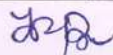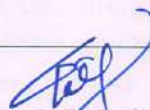Programme: B.Sc. III   Semester- VI

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

Month : March 2022			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. Switching characteristics, specifications, Power MOSFET : MOSFET structure, characteristics, operation and drive circuits
12	40	52	GROUP C: (8051 & FPGA) 1. Arithmetic and logical operations using 8051 µC. 2. Switch and Relay interfacing to 8051 µC. 3. DC motor interfacing to 8051 µC. 4. Study of Timers in 8051 µC. 5. Stepper Motor interfacing to 8051 6. DAC0808 interfacing to 8051 microcontroller. 7. ADC0804 interfacing to 8051microcontroller. 8. Serial communication with PC 9. Write VHDL code to realize basic and derived logic gates. 10. Write VHDL code to realize Half & Full Adder. 11. Write VHDL code to realize Half subtractor and Full Subtractor.	
Month: April 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Unit 3: 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	12. Design and simulation of a 4 bit Adder using VHDL. 13. Write VHDL code to realize MUX (4x1) and De-MUX (1x4) using logic gates. 14. Write VHDL code to realize Decoder -Encoder 15. Write VHDL code to realize Clocked D, JK and T Flip flops	
Month : May2022			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	GROUP D: (AVR and Instrumentation) 1. Interfacing of Switches and LED with Arduino 2. LCD Interfacing with Arduino 3. Stepper Motor Interfacing 4. Interface temperature sensor LM35 with Arduino board. 5. Interface temperature sensor Humidity Sensor (DHT11) with Arduino	

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Department of Electronics
Vivekanand College, Kolhapur.

Month : June2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: **Power Systems** GROUP D: (AVR and Instrumentation)	Power Supplies: Switch mode power supply (DC): flyback, forward, half bridge and full bridge converters. Uninterrupted power supply (UPS), Electronic Ballast, Power factor correction.
12	40	52	6. Accelerometer Sensor Interfacing with Arduino. 7. Study of temperature sensor RTD and Thermister. 8. Function generator using IC 8038 9. Automatic Porch light control using LDR and relay. 10. Study of the characteristics of RTD 11. To study transducer (Thermistor/ Thermocouple)	

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Dr. C. B. Patil

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22
Annual Teaching Plan

Name of the Teacher: **Mr. N. P. Mote**

Programme: B.Sc. I   Semester- I

Subject: Electronics

Course Title: **Practicals**

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope. 3. Verification of (a) Thevenin's theorem and (b) Norton's theorem. 4. Verification of Superposition Theorem.	
0	16	16		
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 5. Verification of the Maximum Power Transfer Theorem.6. Study of the I-V Characteristics of (a) p-n junction Diode, and (b) Zener diode. 7. Study of (a) Half wave rectifier and (b) Full wave rectifier (FWR).	
0	16	16		
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 8. Study the effect of (a) C- filter and (b) Zener regulator on the output of FWR. 9. Study of the I-V Characteristics of UJT and design relaxation oscillator. 10. Study of the output and transfer I-V characteristics of common source JFET.	
0	16	16		
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 11. Study of Fixed Bias and Voltage divider bias configuration for CE transistor. 12. Design of a Single Stage CE amplifier of given gain. 13. Study of the RC Phase Shift Oscillator.	
0	16	16		

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Department of Electronics
Vivekanand College, Kolhapur

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2020-21
Annual Teaching Plan

Name of the Teacher: **Mr. N. P. Mote**
Programme: B.Sc. II   Semester- III and IV
Subject: Electronics

Course Title: **Practicals**

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	16	16	**Group B : (Antenna and Power Electronics)**	
			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	
			5. Study of SCR characteristics (static)	
			Project work	
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	16	16	**Group B : (Antenna and Power Electronics)**	
			6. Study of AC / DC Timer	
			7. SCR firing by UJT	
			8. AC Voltage controller	
			9. Speed Control of DC Motor.	
			10. Study of ON/OFF Temperature controller (LM34/LM35/AD590)	
			11. Phase Shift control of SCR	
			Project work	
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	16	16	**Group B : (Antenna and Power Electronics)**	
			12. Study of Introduction to MATLAB/Scilab	
			13. To study the simulation of single phase half wave controlled rectifier with R & RL-load using MATLAB - simulink/Scilab	
			14. To study the simulation of single phase half controlled bridge rectifier with R using MATLAB - simulink/Scilab	
Month : January 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	16	16	15. Amplitude Modulation-Modulation & Demodulation using MATLAB & Simulink/Scilab	
			16. Sampling Theorem using MATLAB & Simulink/Scilab	
			Project work	

Mr N. P. Mote

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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2021-22

Annual Teaching Plan

Name of the Teacher: **Mr. N. P. Mote**

Programme: B.Sc. III   Semester- V and VI

Subject: Electronics   Course Title: Instrumentation, Antenna and Wave Propagation

Month: October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Measurements, Instrument & Calibration:-	Basics of Measurements: Accuracy, Precision, resolution, reliability, repeatability, validity, Errors and their analysis, Standards of measurement. Instrument: Static and Dynamic characteristics of instruments, dead zone, hysteresis, threshold, resolution, input & output impedance, loading effects. Calibration of instruments and Standards
12	40	52	**Practicals:** **Group D :** 1. Automatic Porch light control using LDR and relay. 2. Study of the characteristics of Resistance Temperature Detector (RTD) **Project work**	
Month : November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	2) Transducers and Sensors:-	Definition, Classification of Transducers, Selection criterion for Transducers, Detail Study of Transducers: Thermister, RTD, Thermocouple, Strain gauge, LVDT, Capacitive transducer (microphone), Opto-electric transducer – LDR, Photo diode, PIR , Loud speaker, Piezoelectric transducer, Proximity sensor Inductive, capacitive.
12	40	52	**Practicals:** **Group D :** 3. Study of LVDT 4. Study of Temperature Sensor LM 35 5. Study of Instrumentation Amplifier **Project work**	
Month: December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	3) Signal Conditioning and Data Acquisition System:	Introduction, Sample and Hold circuit, Thermister Wheatstone bridge amplifier, Instrumentation amplifier, Attenuator, Introduction to Data Acquisition System (DAS), Single channel & multi channel DAS. Data logger.
12	40	52	Practicals: 6. Study of Timers 7. Study of interfacing of LED and Relay to 8051	
Month: January 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	4) Digital Instruments:- Practicals: Group D : 6. Interfacing of Switches and LED with Arduino/AVR microcontroller. 7. LCD Interfacing with Arduino/AVR microcontroller.	Introduction to digital instrument: Advantages of Digital instruments, Digital Tachometer, Digital Capacitance meter, Digital Phase Meter, Digital Frequency Meter. Digital Multi-meter,
12	40	52		

Mr N. P. Mote

Dr. C. B. Patil

Head

Department of Electronics

Vivekanand College, Kolhapur.

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2020-21
Annual Teaching Plan

Name of the Teacher: **Mr. N. P. Mote**
Programme: B.Sc. II   Semester- III and IV
Subject: Electronics

Course Title: **Practicals**

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group B : (Antenna and Power Electronics)** 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 5. Study of SCR characteristics (static) **Project work**	
0	16	16		
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group B : (Antenna and Power Electronics)** 6. Study of AC / DC Timer 7. SCR firing by UJT 8. AC Voltage controller 9. Speed Control of DC Motor. 10. Study of ON/OFF Temperature controller (LM34/LM35/AD590) 11. Phase Shift control of SCR **Project work**	
0	16	16		
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group B : (Antenna and Power Electronics)** 12. Study of Introduction to MATLAB/Scilab 13. To study the simulation of single phase half wave controlled rectifier with R & RL-load using MATLAB - simulink/Scilab 14. To study the simulation of single phase half controlled bridge rectifier with R using MATLAB - simulink/Scilab	
0	16	16		
Month : January 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 15. Amplitude Modulation-Modulation & Demodulation using MATLAB & Simulink/Scilab 16. Sampling Theorem using MATLAB & Simulink/Scilab **Project work**	
0	16	16		

Mr N. P. Mote

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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22
Annual Teaching Plan

Name of the teacher: **Dr. P. S. Jadhav**
Programme: B.Sc. I Semester- I
Subject: Electronics Course Title: **DSC-1005A   Section-II: Digital Electronics-I**

Month : October 2021			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
12	32	44	Practical's: Group A 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 ofThevenin's Theorem.	
			Unit 2:Logic Gates, Boolean algebra:	Study of logic Gates: OR, AND, NOT, NOR, NAND, XOR, XNOR, Universal Gates, Boolean identities and Law's.
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lectures : Unit 2:Logic Gates, Boolean algebra:	Fundamental theorems of Boolean algebra. Standard representation of logic functions (SOP and POS), Minimization Techniques (Karnaugh map minimization up to 4variables for SOP).Arithmetic Circuits: Binary Addition. Half and Full Adder. Half and Full Subtractor, 4-bit binary Adder/Subtractor.
12	32	44	Practicals: 1. Verification of Superposition Theorem. 2. Study of the I-V Characteristics of P-N junction Diodes. 3. Study of the breakdown Characteristics of Zener Diode	
			Unit 3:Logic Families	Logic Families: Types of Logic Families, Characteristics of Logic Families, TTL NAND gate, TTL NOR gate, TTL NOT gate

1

Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Lecture: Unit 3:Logic Families	Concept of Tristate Logic, MOS Technology, CMOS: NOR,NAND and NOT gates, Comparison of TTL and CMOS logic families.
12	32	44	Practicals: 1. Study of Full wave rectifier 2. Study of Logic Gates. 3. Study of Universal Gates using fundamental gates.	
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 4:Combinational circuits: 1. Verification of Norton`s Theorem. 2. Study of De-Morgans Theorems. 3. Study of Half wave rectifier	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.
12	32	44		

Dr. P. S. Jadhav

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2

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Department of Electronics
Academic Year: 2021-22
Annual Teaching Plan
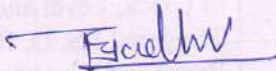
Name of the teacher: **Dr. P. S. Jadhav**
Programme: B.Sc. I Semester- II
Subject: Electronics Course Title: **DSC-1005B Section- II Digital Electronics-II**

Month: March 2022			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. Preset and Clear operations. Race-around conditions in JK Flip-Flop, Master-slave JK Flip-Flop, T-Flip-flop.
12	32	44	1. Study of Half Adder and Full Adder 2. Study of Multiplexer (4:1) and Demultiplexer (1:4) 3. Study of I-V Characteristics of JFET. 4. Study of Input and Output Characteristics of CE configuration of BJT	
Month : April 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 2: Shift registers and counters	Concept of register, Left shift and Right Shift operations, Types of shift registers: SISO, SIPO, PISO & PIPO (only up to 4 bits). Counters: classification ofcounters, Asynchronous counters: 3 bit ripple counter, Decade Counter. Synchronous Counter: 3 bit and decade synchronous counter. Ring Counter and Johnson Counter .Applications of Counters.
12	32	44	Practical: 1. Wein Bridge Oscillator. 2. Study of the Colpitt`s oscillator 3. Study of the Hartley oscillator. 4. Building and testing of RS Flip-Flop using NAND/NOR gate	
Month: May 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 3: Data Converters Practical:	4 bit binary weighted and R-2R ladder network DAC: circuit and working. DAC Characteristics: Accuracy and Resolution. ADC: Flash, Counter type, successive approximation ADC, ADC Characteristics.
12	32	44	1. Building and testing D and JK Flip-Flop using IC 2. Design and study of an Astable Multivibrator using IC 555 Timer. 3. Design and study of a Monostable Multivibrator using IC 555 Timer. 4. computer simulations: 5. Design clocked SR and JK Flip-Flops using Gates. 6. Design 4-bit asynchronous counter using Flip-Flop ICs	

Month: June 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	Unit 4: Study of Timer IC555	IC555 timer: Introduction, Block diagram, Astable, Monostable and Bistable multivibrator circuits. Applications of IC555: PWM, square wave generator and FSK.
12	32	44		

Dr. P. S. Jadhav

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4

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Department of Electronics
Academic Year: 2021-22

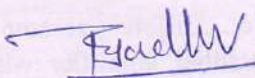### Annual Teaching Plan

Name of the teacher: **Dr. P. S. Jadhav**
Programme: B.Sc. III Semester-V
Subject: Electronics Course Title: **DSC-1005E2Section – I**   **Linear Integrated Circuits**

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Operational Amplifier and Linear IC's	Transistor dc amplifier, Differential amplifier, Emitter coupled differential amplifier with its Operation, characteristics and parameters (I/O impedances, common mode and differential mode gain, CMRR), Dual input and single ended output configuration of differential amplifier. Method to improve CMRR (constant current bias and current mirror bias), Introduction to op-amp, block diagram of op-amp, offset balancing technique of op-amp, drift Parameters of op-amp, study of IC 741 and comparative study of IC's OP 07, LM324, AD620
12	0	12		
Month : Novemeber 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Applications of Op-amp	Virtual ground concept, Op-amp as inverting and non- inverting amplifier, summing amplifier (adder and Subtractor), V to I and I to V converter voltage follower, bridge amplifier, Differentiator and integrator, log and antilog amplifier. Op-amp as comparator, regenerative comparator (Schmitt trigger), sine wave oscillators (phase shift and Wien -bridge), Triangular wave generator, square and pulse generator. Peak detector, clipping and clamping circuits.
12	0	12		
Month: December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: Precision Rectifier and Active filters	Precision rectifier, Op-amp as precision rectifier, Absolute value precision rectifier. Advantage of active filters over passive filters. Different types of active filters. Study and design of low pass, high pass, band pass and band stop filters Study of filter response (Butterworth, Chebyshev.)
12	0	12		
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 4: Phase	Block diagram of PLL with functioning of each

5

12	0	12	Locked Loops (PLL)	block, calculation of capture range and lock range frequencies, application of PLL (frequency multiplier, FM modulator, frequency synthesizer and FSK) Study of IC565, IC8038. IC555 timer as variable duty cycle (10% to 90%), sequential timer, ramp generator.

Dr. P. S. Jadhav

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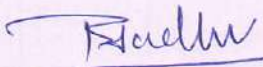### Academic Year: 2021-22
Annual Teaching Plan

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

Programme: B.Sc. III Semester- VI

Subject: Electronics Course Title: **DSE-1005F2   Section- II FPGA& VHDL Programming**

Month: March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit I: Introduction to Programmable Logic Devices	Evolution of Programmable logic devices, PAL, PLA and GAL. CPLD and FPGA architectures. Placement and routing. Logic Cell structure, Programmable interconnects, Logic blocks and I/O Ports. Clock distribution in FPGA
12	0	12		
			Unit: II Basics of VHDL	Introduction: Introduction to Computer-aided design tools for digital systems. Hardware description languages, introduction to VHDL, data objects
Month : April 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 2: Basics of VHDL	classes and data types, operators, overloading, logical operators, Types of delays, Entity and Architecture declaration, Introduction to behavioral, dataflow and structural models.
12	0	12		
Month: May 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 3: VHDL Programming	VHDL statements: Assignment statements, sequential statements and process, conditional statements, case statement, Array and loops, resolution functions, packages and Libraries, concurrent statements. Subprograms: Application of Functions and Procedures, Structural Modelling, Component declaration, structural layout and generics
12	0	12		
Month: June 2022			Unit 4: Sequential and Combinational Circuit Design:	VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders ,decoders, code converters, comparators, implementation of Boolean functions etc. Sequential Circuits Design: VHDL Models and Simulation of sequential Circuits, Shift Registers, counters etc.
Lectures	Practicals	Total		
12	0	12		

Dr. P. S. Jadhav

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7

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Department of Electronics

Academic Year: 2021-22

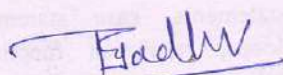## Annual Teaching Plan

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

Programme: B.Sc. III   Semester- VI

Subject: Electronics   Course Title: **SEC 4: Introductions to Arduino and IoT**

Month : March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Introduction to Arduino Board & Accessories :	The Arduino Platform, Block diagram, Architecture, Pin functions, overview of main features such as I/O Ports, Timers, interrupts serial port, PWM, ADC etc.
6	0	6		
Month: April 2022			Module/Unit:	Sub-units planned
6	0	6	2) Display Interfacing:	Interfacing Arduino to LED's- blinking single LED, blinking multiple LED's, 7 segment display
Month: May 2022				
6	0	6	2) Display Interfacing:	Traffic light ,LED flashes ,LED dot matrix . Interfacing to LCD's- Basic LCD control, display a message on LCD screen.

Dr. P. S. Jadhav

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8

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2021-22

Annual Teaching Plan

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

Programme: B.Sc. III   Semester- V

Subject: Electronics

Course Title: **Practicals**

Month : October 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	40	40	**Group B : (Antenna and Power Electronics)** 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 5. Study of SCR characteristics (static) **Project work**	
Month: November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	40	40	**Group B : (Antenna and Power Electronics)** 6. Study of AC / DC Timer 7. SCR firing by UJT 8. AC Voltage controller 9. Speed Control of DC Motor. 10. Study of ON/OFF Temperature controller (LM34/LM35/AD590) 11. Phase Shift control of SCR **Project work**	
Month : December 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:**	
0	40	40	**Group B : (Antenna and Power Electronics)** 12. Study of Introduction to MATLAB/Scilab 13. To study the simulation of single phase half wave controlled rectifier with R & RL-load using MATLAB - simulink/Scilab 14. To study the simulation of single phase half controlled bridge rectifier with R using MATLAB - simulink/Scilab	
Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** 15. Amplitude Modulation-Modulation & Demodulation using MATLAB & Simulink/Scilab	
0	40	40	16. Sampling Theorem using MATLAB & Simulink/Scilab **Project work**	

Dr. Milind S. Patil

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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2021-22

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: March 2022			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 Instrumentation)** 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. 4. Interface temperature sensor LM35 with Arduino board and display temperature on LCD. **Project work**	
Month : April 2022			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:	4) Interfacing of Switches, Relays, LEDs, seven segment display 16x2 LCD Interfacing, Stepper interfacing.
			Practicals: Group D : (AVR and Instrumentation) 5. Interface temperature sensor 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 of temperature sensor RTD and Thermistor 8. Function generator using IC 8038 **Project work**	

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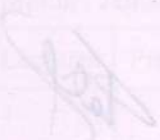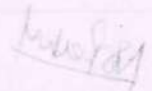| Month: May 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	5) Designing of an Embedded System:	5) DC Motor speed control using PWM technique, Measurement of Temperature of an environment using sensor LM35, Dual channel Digital Voltmeter.
12	40	52		
Month: June 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals:** **Group D : (AVR and Instrumentation)** 9. Automatic Porch light control using LDR and relay. 10. Study of the characteristics of Resistance Temperature Detector (RTD) 11. To study transducer (Thermistor/ Thermocouple) **Project work**	
12	40	52		

Dr. Milind S. Patil

Dr. C.B.Patil

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2022-23

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 : January 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: February 2023			**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 : March 2023			**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 : April 2023			**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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Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Academic Year: 2021-22

Annual Teaching Plan

Name of the teacher: **Mr. G. B. Jirage**
Programme: B.Sc. III   Semester- (V)
Subject: Electronics Course Title: Practical's

Month : November 2022			Module/Unit:	Sub-units planned
Lectures	Practical's	Total	**Practicals Group A:** 1. To design an Amplitude Modulator using Transistor/ Op-amp 2. To study envelope detector for demodulation of AM signal 3. To study FM - Generator / Detector 4. To study AM Transmitter / Receiver 5. To study FM Transmitter /Receiver	
0	25	25		

Month: December 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Demodulation 6. To study Time Division Multiplexing (TDM) 7. To study Pulse Amplitude Modulation (PAM) 8. To study Pulse Width Modulation (PWM) 9. To study Pulse Position Modulation (PPM) 10. To study ASK modulator	
0	25	25		

Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	**Practicals Group A:** 11. To study PSK modulator 12. To study FSK modulator **Practicals Group B:** 1. Addition and subtraction of numbers using direct addressing mode 2. Addition and subtraction of numbers using indirect addressing mode 3. Multiplication by repeated addition 3. Multiplication by repeated addition	
0	25	25		

Mr. G. B. Jirage

Dr. C. B. Patil

Vivekanand College, Kolhapur (Autonomous)

Department of Electronics
Academic Year: 2021-22

Annual Teaching Plan

Name of the teacher: **Mr. G. B. Jirage**
Programme: B.Sc. III   Semester- VI
Subject: Electronics Course Title: DSC-1005F1: Industrial Process control and PLC programming

Month : March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Introduction of control system Unit 2: Components 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		
Month:April 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 : May 2022			Unit 4 :Ladder	Sub-units planned
Lectures	Practicals	Total		4) Basic components: fuse, pushbutton,

Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Academic Year: 2021-22
Annual Teaching Plan

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

Programme: B.Sc. III   Semester- V

Subject: Electronics   Course Title: **SEC 3:Renewable Energy**

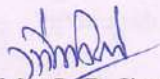| Month : November 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1)Introduction to Renewable Energy	Causes of Energy Scarcity, Solution to Energy Scarcity, Factors Affecting Energy Resource Development, Energy Resources and Classification, Renewable Energy – Worldwide Renewable Energy Availability, Renewable Energy in India.
12	0	12	2) Solar energy	Solar energy, its importance, storage of solar energy, solar pond, nonconvective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems
Month: December 2021			3) Wind Energy harvesting:	Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid Interconnection topologies.
12	0	12	4) A. Ocean Energy:	Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.
Month : January 2022			4)B. Geothermal Energy:	Geothermal Resources, Geothermal Technologies.
12	0	12	4)C. Hydro Energy:	Hydropower resources, hydropower technologies, environmental impact of hydro power sources:
			5) Piezoelectric Energy harvesting:	Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power

Mr. G. B. Jirage

Dr. C. B. Patil
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Department of Electronics
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12	0	12	Programming basics	selector switches, limit switches, Indicators, relay, timedelay relays functions and symbols. General PLC Programming procedures, programming on-off inputs/ outputs. Auxiliary 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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Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2021-22

Annual Teaching Plan

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

Programme: B.Sc. I Semester- II

Subject: Electronics Course: DSC-**1005B Section-I Analog Electronics-II**

Month: March 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	Unit 1: Bipolar Junction Transistor: **Practical: Group- B**	BJT: Structure, Working of transistor. Transistor configurations: CB, CE and CC, characteristics of transistor in CE and CB configurations, Current gains α and β, dc load line and Q point
8	32	40	1. Study of Half Adder and Full Adder 2. Study of Multiplexer (4:1) and Demultiplexer (1:4) 3. Study of I-V Characteristics of JFET. 4. Study of Input and Output Characteristics of CE configuration of BJT	
			2) Unipolar Devices:	JFET: Construction, working and I-V characteristics MOSFET: Construction, working and I-V characteristics, UJT: introduction, structure and characteristics.
Month : April 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	3) Amplifiers: Practical:	Transistor biasing - Fixed Bias and Voltage Divider Bias, Class A, B, AB and C Amplifiers, Single stage CE amplifier, Cascaded Amplifiers: Two stage RC, LC, TC and DC Coupled Amplifiers ,Concept of Differential amplifier and its advantages..
8	32	40	5. Wein Bridge Oscillator. 6. Study of the Colpitt`s oscillator 7. Study of the Hartley oscillator. 8. Building and testing of RS Flip-Flop using NAND/NOR gate	
Month: May 2022			Module/Unit:	Sub-units planned
Lectures	Practical	Total	4) Feedback Amplifier and Oscillators:	Negative and positive feedback, Oscillators:

8	32	40		Barkhausen criterion for sustained oscillations, Phase shift, Wein Bridge, Hartley and Colpitt's oscillator ,UJT as relaxation oscillator

Mr. G. B. Jirage

Dr. C. B. Patil

Department of Electronics
Vivekanand College, Kolhapur.

Vivekanand College, Kolhapur (Autonomous)
Department of Electronics
Academic Year: 2021-22

Annual Teaching Plan

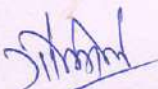Name of the teacher: **Mr. G. B. Jirage**

Programme: B.Sc. I   Semester- I

Subject: Electronics Course Title: **DSC-1005A Section-I Analog Electronics-I**

Month : November 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1) Basic Circuit Elements **Practical's: Group- A**	Study of basic circuit elements and passive components: Resistor, Capacitor, Inductor, Transformer, Relays, Switches (working principle, circuit symbols, types, specifications and applications).
8	32	40	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 ofThevenin's Theorem. Verification of Norton's Theorem.	
Month: December 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	2) Circuit Analysis Practicals: 4. Verification of Superposition Theorem.	Concept of Voltage and Current Sources, Internal resistance, Kirchhoff's Current Law, Kirchhoff's Voltage Law. Mesh Analysis. Node Analysis. Principle of Duality, Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem, Millman's Theorem. (Numericals expected)
8	32	40	5. Study of the I-V Characteristics of P-N junction Diodes. 6. Study of the breakdown Characteristics of Zener Diode 7. Study of Half wave rectifier	
			3) PN Junction Diode	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.

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Department of Electronics

Month : January 2022			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	4) DC Power Supply Practicals:	Need of Power Supply, Block diagram of DC regulated power supply, Rectifiers: Half wave, Full wave rectifiers (centre tapped and bridge):- Circuit diagrams, working and waveforms, ripple factor, PIV, efficiency and TUF. Filter-Shunt capacitor filter, Series inductor filter, π - filter. Regulation: Concept of Line and load regulation, Zener diode as voltage regulator, Three pin IC regulators: Block diagram, Specifications and applications. Fixed and Variable voltage IC regulator (IC 78xx,79xx and LM317). Concept of SMPS.
8	32	40	8. Study of Full wave rectifier	
			9. Study of Logic Gates.	
			10. Study of Universal Gates using fundamental gates.	
			11. Study of De-Morgans Theorems	

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Academic Year: 2021-22
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Name of the teacher: **Mr. G. B. Jirage**

Programme: B.Sc. III   Semester- V

Subject: Electronics   Course Title: **SEC 3:Renewable Energy**

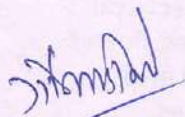| Month : August 2021			Module/Unit:	Sub-units planned
Lectures	Practicals	Total	1)Introduction to Renewable Energy	Causes of Energy Scarcity, Solution to Energy Scarcity, Factors Affecting Energy Resource Development, Energy Resources and Classification, Renewable Energy – Worldwide Renewable Energy Availability, Renewable Energy in India.
12	0	12	2) Solar energy	Solar energy, its importance, storage of solar energy, solar pond, nonconvective solar pond, applications of solar pond and solar energy, solar water heater, flat plate collector, solar distillation, solar cooker, solar green houses, solar cell, absorption air conditioning. Need and characteristics of photovoltaic (PV) systems, PV models and equivalent circuits, and sun tracking systems
Month: September 2021				
12	0	12	3) Wind Energy harvesting:	Fundamentals of Wind energy, Wind Turbines and different electrical machines in wind turbines, Power electronic interfaces, and grid interconnection topologies. Ocean Energy: Ocean Energy Potential against Wind and Solar, Wave Characteristics and Statistics, Wave Energy Devices.
			4) A. Ocean Energy:	
Month : October 2022				
12	0	12	4)B. Geothermal Energy:	Geothermal Resources, Geothermal Technologies.
			4)C. Hydro Energy:	Hydropower resources, hydropower technologies, environmental impact of hydro power sources:
Month : Nov 2022				
12	0	12	4	Introduction, Physics and characteristics of piezoelectric effect, materials and mathematical description of piezoelectricity, Piezoelectric parameters and modeling piezoelectric generators, Piezoelectric energy harvesting applications, Human power
			5) Piezoelectric Energy harvesting:	

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12	0	12	Programming basics	selector switches, limit switches, indicators, relay, timedelay relays functions and symbols. General PLC programming procedures, programming on-off inputs/ outputs.

Month : April 2023

Lectures	Practicals	Total	Unit 4 :Ladder Programming basics	Auxiliary commands and functions: PLC Basic Functions: Register basics, timer functions, counter functions. Ladder .
12	0	12		

Month : may 2023

Lectures	Practicals	Total		Programming: Programs for Boolean logic and flip-flops, counters , timers, flasher. Application program Bottle filling plant, elevator control, washing machine control
12	0	12		

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