

# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: **B.Sc. II Semester- III**

Subject: **Electronics** Course Title: **MIN03ELE32: Architecture of 8051 Microcontroller**

| Month : July 2025  |            |       | Module/Unit:                            | Sub-units planned                                                                                                                                                                                   |
|--------------------|------------|-------|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures           | Practicals | Total | 1) Fundamental of 8051 Microcontroller: | 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. |
| 8                  | -          | 8     |                                         |                                                                                                                                                                                                     |
| Month: August 2025 |            |       | Module/Unit:                            | Sub-units planned                                                                                                                                                                                   |
| Lectures           | Practicals | Total | 2) Instruction Set of 8051:             | Classification of instruction sets, Addressing modes.Instruction set of 8051: Data transfer, Arithmetic, Logical, Jump, Call, Boolean instructions.                                                 |
| 8                  | -          | 8     |                                         |                                                                                                                                                                                                     |
| Month : Sept 2025  |            |       | Module/Unit:                            | Sub-units planned                                                                                                                                                                                   |
| Lectures           | Practicals | Total | 3) Timers and Counters :                | 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         |
| 8                  | -          | 8     |                                         |                                                                                                                                                                                                     |
| Month : Oct 2025   |            |       | Module/Unit:                            | Sub-units planned                                                                                                                                                                                   |
| Lectures           | Practicals | Total | 4) Serial and Interrupt Programming:    | Serial port of 8051, modes, Serial port Registers, Serial Port programming. Interrupt: Interrupt in 8051, Interrupt registers, Programming with interrupt                                           |
| 4                  | -          | 4     |                                         |                                                                                                                                                                                                     |

  
Dr. C. B. Patil



  
Dr. C. B. Patil

**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**

Department of Electronics  
Academic Year: 2025-26  
Annual Teaching Plan

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

Programme: B.Sc. II Semester- III

Subject: Electronics Course Title: **DSC03ELE32 Microprocessor 8085**

| Month : July 2025  |            |       | Module/Unit:                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                           |
|--------------------|------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures           | Practicals | Total | <b>1) Microcomputer Organization:</b><br><b>2) Architecture of 8085 Microprocessor:</b>                                                                                                                                                                           | <b>1) Components of microcomputer, RAM (SDRAM, DRAM), ROM Memory Interfacing and Memory Map</b>                                                                                                                                                                                                                             |
| 8                  | 16         | 24    | <b>Practicals Group A:</b><br>1.To study Amplitude Modulator and demodulator<br>2.To study FM modulator<br>3.To study Pulse Amplitude Modulation (PAM)<br>4.To study Pulse Width Modulation (PWM)<br>5.To study ASK Modulator                                     | <b>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</b> |
| Month: August 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                           |
| Lectures           | Practicals | Total | <b>3) Instruction Set of 8085 Microprocessor :</b>                                                                                                                                                                                                                | <b>3) classification of Instruction Set, Addressing modes, Instruction set: Data transfer, Arithmetic, logical, branch and control instructions</b>                                                                                                                                                                         |
| 8                  | 16         | 24    | <b>Practicals Group A:</b><br>1. To study PSK Modulator<br>2. To study FSK Modulator<br>3. To study PCM<br>4. To study PPM<br>5. Study of Tuned Amplifier                                                                                                         |                                                                                                                                                                                                                                                                                                                             |
| Month : Sept 2025  |            |       | Module/Unit:                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                           |
| Lectures           | Practicals | Total | <b>4) Programming with 8085 Microprocessor:</b>                                                                                                                                                                                                                   | <b>4) Programs of Addition (8 and 16 bit), Subtraction, Multiplication, Division, Block Transfer and Exchange, Masking,</b>                                                                                                                                                                                                 |
| 8                  | 16         | 24    | <b>Practicals Group B:</b><br>1.Addition of Two 8 Bit Numbers<br>2.Subtraction of Two 8 Bit Numbers<br>3.Multiplication of Two 8 Bit Nos.<br>4.Division of Two 8 Bit Numbers<br>5.Program to transfer the memory block<br>6.Program to exchange the memory blocks |                                                                                                                                                                                                                                                                                                                             |
| Month : Oct 2025   |            |       | Module/Unit:                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                           |
| Lectures           | Practicals | Total | <b>4) Programming with 8085</b>                                                                                                                                                                                                                                   | <b>ascending and descending order, Time delay generation using register and register pair, Detection of odd and even numbers.</b>                                                                                                                                                                                           |
| 4                  | 8          | 12    | <b>Practicals Group B:</b><br>7.To arrange the given number in ascending and descending order<br>8.Programs to find even and odd nos.<br>9.To find total number of even and odd numbers in an array<br>10.Programs for masking and to find parity of given number |                                                                                                                                                                                                                                                                                                                             |

Dr. C. B. Patil



Dr. C. B. Patil

HEAD

DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

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 2025  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sub-units planned                                                                                                                                                                                                                                                          |
|--------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures           | Practicals | Total | 1) Introduction to embedded C<br>Practicals:<br>Group A : (Instrumentation-I & II)<br>1. Design of multi-range ammeter, voltmeter, conversion of ammeter into voltmeter<br>2. Study of temperature sensor RTD and Thermistor<br>3. Automatic Porch light control using LDR and relay<br>4. Measurement of displacement using LVDT<br>5. Study of ON/OFF Temperature controller (LM34/LM35/AD590)<br>6. Study of Actuator (Solenoid)<br>7. Study of solid state relay<br>& Project work                                                     | 1) Advantages and disadvantages of programming in 8051-C & Assembly Language.<br>Data types, Time delay – using for loop and using 8051 Timers, I/O programming, Logical operations, Data conversion programs                                                              |
| 12                 | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                            |
| Month: August 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sub-units planned                                                                                                                                                                                                                                                          |
| Lectures           | Practicals | Total | 2) Interfacing of Input Output Devices<br>Practicals:<br>Group A : (Instrumentation-I & II)<br>1. Study of simple dipole $\lambda/2$ antenna<br>2. Study of folded dipole $\lambda/2$ antenna<br>3. Study of simple dipole $\lambda/4$ antenna<br>4. Study of Yagi-Uda with 3 and 5 element simple dipole antenna & Project work                                                                                                                                                                                                           | 2) Output devices: LED, Relay, Opto-coupler, LCD, Seven Segment Display, Seven Segment Display (multiplexing mode), DC Motor, Stepper Motor<br>Input devices: Switch, 4X4 matrix keyboard, thumb wheel switch                                                              |
| 12                 | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                            |
| Month : Sept 2025  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Sub-units planned                                                                                                                                                                                                                                                          |
| Lectures           | Practicals | Total | 3) ADC, DAC Interfacing<br>4) Sensor Interfacing<br>Practicals:<br>Group A : (LIC & PLC)<br>1. Study of Timers in 8051 Microcontroller.<br>2. LED, Switch and Relay interfacing to 8051 microcontroller.<br>3. LCD Interfacing with 8051 Microcontroller.<br>4. DC motor interfacing to 8051 microcontroller.<br>5. Stepper Motor interfacing to 8051 microcontroller.<br>6. DAC0808 interfacing to 8051 microcontroller.<br>7. ADC0804 interfacing to 8051 microcontroller.<br>8. Serial communication with PC using 8051 microcontroller | 3) Interface ADC 0804, ADC 0808/0809, ADC MAX1112, DAC 0808 (Triangular wave, Ramp, Staircase) 4) 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) |
| 12                 | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                            |

|                  |            |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                   |
|------------------|------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
|                  |            |       | 8. Serial communication with PC using 8051 microcontroller<br>Project work                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                   |
| Month : Oct 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Sub-units planned                                                                                                 |
| Lectures         | Practicals | Total | 4) Sensor Interfacing<br>9. Study of PLC Simulator (TriLOGI Software)/ codesys-software/ hardware and implementing Boolean function<br>10. Programming with PLC (TriLOGI Software)/ codesys-software/ hardware) for sequential logic RS-FF, JK-FF<br>11. Programming with PLC (TriLOGI Software)/ codesys-software/ hardware) for sequential logic T-FF, D-FF<br>12. Study of PLC timers and counters in PLC ((TriLOGI Software)/ codesys-software/ hardware) | AC current sensor (CT-current Transformer), AC voltage sensor (PT-potential transformer), LVDT, Ultrasonic module |
| 6                | 16         | 22    |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                   |

  
Dr. C. B. Patil



  
Dr. C. B. Patil  
**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: **B.Sc. II Semester- IV**

Subject: **Electronics** Course Title: **DSC03ELE42: Microcontroller 8051**

| Month : Dec 2025   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                            | Sub-units planned                                                                                                                                                                                                                                         |
|--------------------|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures           | Practicals | Total | <b>1) Introduction to 8051 Microcontroller:</b><br><b>Practicals Group A:</b><br>1. To design Op-Amp as Inverting and Non-Inverting amplifier<br>2. To study Op-Amp as adder and Subtractor<br>3. To study Op-Amp as integrator and differentiator<br>4. To study Op-Amp as Schmitt trigger.<br>5. To study Op-Amp as comparator        | Comparison between microprocessor and microcontroller, Salient features of 8051 family, Block diagram of 8051, Pin description of 8051 microcontroller, RAM structure of 8051, SFR's and GPR's in 8051, PSW register, Clock and Reset circuits, I/O Ports |
| 8                  | 16         | 24    |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                           |
| Month : Jan 2026   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                            | Sub-units planned                                                                                                                                                                                                                                         |
| Lectures           | Practicals | Total | <b>2) Instruction Set of 8051:</b><br>Microprocessor :<br><b>Practicals Group A:</b><br>1. Arithmetic instruction<br>2. Logical instruction<br>3. Boolean/Bit manipulation instruction<br>4. Code conversion using 8051<br>5. Study of timers of 8051 in mode 1<br>6. Study of timers of 8051 in mode 2<br>7. Study of counters of 8051 | Classification of instruction sets, Addressing modes.<br>Instruction set of 8051: Data transfer, Arithmetic, Logical, Jump, Call, Boolean instructions.                                                                                                   |
| 8                  | 16         | 24    |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                           |
| Month : Feb 2026   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                            | Sub-units planned                                                                                                                                                                                                                                         |
| Lectures           | Practicals | Total | <b>3) 8051 Timer Programming :</b><br>Microprocessor:<br><b>Practicals Group B:</b><br>6. To design phase shift oscillator<br>7. To design Wein bridge oscillator<br>8. To study triangular wave generator<br>9. To study as Square wave generator<br>10. To study precision rectifier.<br>11. To study peak detector                   | Introduction to Timers, Timer Registers, Timer modes and Timer Programming using mode 1 and mode 2:- Square wave generation, rectangular wave generation<br>Counter Programming: pulse counter                                                            |
| 8                  | 16         | 24    |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                           |
| Month : March 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                            | Sub-units planned                                                                                                                                                                                                                                         |
| Lectures           | Practicals | Total | <b>8051 Serial and Interrupt Programming:</b><br>8. Study of Serial programming<br>9. Study of Timer Interrupts programming<br>10. Study of Serial communication Interrupts programming<br>11. Study of External hardware Interrupts programming                                                                                        | Serial ports: Serial port of 8051, modes, Serial port Registers, Serial port programming.<br>Interrupt: Interrupt in 8051, Interrupt registers, Programming with interrupt                                                                                |
| 4                  | 8          | 12    |                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                           |

Dr. C. B. Patil



Dr. C. B. Patil

**HEAD**

**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**

# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2026-27

## Annual Teaching Plan

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

Programme: B.Sc. II Semester- IV

Subject: Electronics Course Title: MIN03ELE42: 8051 Microcontroller Interfacing and Embedded C

| Month : Dec 2025  |            |       | Module/Unit:                           | Sub-units planned                                                                                                                                                                           |
|-------------------|------------|-------|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures          | Practicals | Total | 1) Introduction to Embedded C          | Advantages and disadvantages of programming in 8051-C, Data types, Time delay – using for loop and using 8051 Timers, I/O programming, Logical operations, Data conversion programs         |
| 8                 | -          | 8     |                                        |                                                                                                                                                                                             |
| Month: Jan 2026   |            |       | Module/Unit:                           | Sub-units planned                                                                                                                                                                           |
| Lectures          | Practicals | Total | 2) Interfacing of Input Output Devices | Output devices: LED, Relay, Opto-coupler, LCD, Seven Segment Display, Seven Segment Display (multiplexing mode), DC Motor, Stepper Motor; Input devices: Switch, thumb wheel switch,        |
| 8                 | -          | 8     |                                        |                                                                                                                                                                                             |
| Month : Feb 2026  |            |       | Module/Unit:                           | Sub-units planned                                                                                                                                                                           |
| Lectures          | Practicals | Total | 3) ADC, DAC Interfacing                | Interface ADC 0804, ADC 0808/0809, ADC MAX1112, DAC 0808 (Triangular wave, Ramp, Staircase)                                                                                                 |
| 8                 | -          | 8     |                                        |                                                                                                                                                                                             |
| Month :March 2026 |            |       | Module/Unit:                           | Sub-units planned                                                                                                                                                                           |
| Lectures          | Practicals | Total | 4) Sensor Interfacing                  | 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), Ultrasonic module |
| 4                 | -          | 4     |                                        |                                                                                                                                                                                             |

Dr. C. B. Patil



Dr. C. B. Patil

**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2025-26

## Annual Teaching Plan

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

Programme: **B.Sc. III Semester- VI**

Subject: **Electronics**

Course Title: **Practicals**

| Month : Dec 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                      |
|------------------|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures         | Practicals | Total | <b>1) Embedded Systems Design Practical:</b><br><b>Group A : (Instrumentation-II)</b><br>8. Function generator using IC 8038<br>9. Instrumentation amplifier using OPAMP<br>10. Study of active filter : Low and High Pass<br>11. Study of active filter : Band Pass<br>12. Study of V to F and F to V using VCO<br><b>&amp; Project work</b>                                                                                                                                                                                                                         | What is embedded system, embedded system basic blocks, embedded system hardware and software, embedded system characteristics, embedded system applications                                            |
| 12               | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                        |
| Month: Jan 2026  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                      |
| Lectures         | Practicals | Total | <b>2) Introduction to AVR microcontroller Practical:</b><br><b>GROUP B: Power Electronics</b><br>6. SCR firing by UJT<br>7. AC Voltage controller<br>8. Speed Control of DC Motor.<br>9. Phase Shift control of SCR<br>10. Design of Single phase full wave controlled rectifier<br>11. To study the simulation of single phase half wave controlled rectifier with R & RL load using MATLAB - Simulink/Scilab<br>12. To study the simulation of single phase full wave controlled bridge rectifier with R load using MATLAB - Simulink/Scilab<br><b>Project work</b> | 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               | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                        |
| Month : Feb 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                      |
| Lectures         | Practicals | Total | <b>3) AVR Programming in C Practical:</b><br><b>GROUP D: AVR</b><br>1. Interfacing of Switches and LED with Arduino/AVR microcontroller.<br>2. LCD Interfacing with Arduino/AVR microcontroller.<br>3. Stepper Motor Interfacing with Arduino/AVR microcontroller.<br>4. Interface temperature sensor LM35 with Arduino board and display temperature on LCD.<br>5. Interface temperature sensor and Humidity Sensor (DHT11) with                                                                                                                                     | 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               | 32         | 42    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                        |

|                    |            |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                       |
|--------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |            |       | Arduino/AVR board and display temperature and humidity values on LCD.<br>6. Accelerometer Sensor Interfacing with Arduino/AVR microcontroller.<br>Project work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                       |
| Month : March 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                     |
| Lectures           | Practicals | Total | <b>4) Peripheral Interfacing and Embedded System</b><br><b>GROUP D: IoT</b><br>7. Study the fundamental of IOT Architecture, Arduino and necessary software and create the thingspeak account<br>8. Interface Bluetooth with Arduino and send the sensor data to smartphone through Bluetooth<br>9. Interface Bluetooth with Arduino and receive the data from smartphone through Bluetooth to turn LED ON/OFF<br>10. Interface wifi module with Arduino to upload sensor data to thingspeak cloud<br>11. Interface wifi module with Arduino to retrieve data from thingspeak cloud<br>12. Interface GSM module with Arduino to upload sensor data to thingspeak cloud<br>13. Read the sensor data and upload the data to thingspeak cloud using NodeMCU<br>14. Study and implement MQTT protocol using Arduino<br>15. IoT Application Case study: Home Automation | Interfacing of Switches, Relays, LEDs, seven segment display, 16x2 LCD<br>Interfacing, Stepper interfacing<br>Designing of an Embedded System: DC Motor speed control using PWM technique, Measurement of Temperature of an environment using sensor LM35, Dual channel Digital Voltmeter. (Block diagram, Schematic and Flowchart is only necessary) |
| 6                  | 16         | 22    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                       |

  
 Dr. C. B. Patil



  
 Dr. C. B. Patil  
 HEAD  
 DEPARTMENT OF ELECTRONICS  
 VIVEKANAND COLLEGE, KOLHAPUR  
 (EMPOWERED AUTONOMOUS)



**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

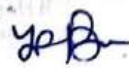
Programme: **B.Sc. II Semester- III**

Subject: **Electronics**

Course Code: **2MIN03ELE31**

Course Name: **Principles of Electronics Communication**

| Month :        | Module/Unit:                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                               |
|----------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July 2025      |                                                    |                                                                                                                                                                                                                                                                                                                                                                 |
| Lectures: 8    | Unit 1: Electronic communication                   | 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: Definition, Types of noise (External noise, internal noise), signal-to-noise (S/N) ratio |
| Month:         | Module/Unit:                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                               |
| August 2025    |                                                    |                                                                                                                                                                                                                                                                                                                                                                 |
| Lectures: 8    | Unit 2: Amplitude Modulation (AM) and Demodulation | Introduction to modulation, Need for modulation, Amplitude Modulation (AM): Mathematical expression, modulation index, frequency spectrum and AM power, Classification of AM, Concept of DSB, SSB generation, Amplitude Demodulation (diode detector)                                                                                                           |
| Month :        | Module/Unit:                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                               |
| September 2025 |                                                    |                                                                                                                                                                                                                                                                                                                                                                 |
| Lectures: 8    | Unit 3: Frequency Modulation (FM) and Demodulation | Principles of Frequency modulations, modulation index, frequency spectrum, Generation of FM using VCO, FM Demodulation: (Slope detector), equivalence between FM and AM, phase modulators (Concept only).                                                                                                                                                       |
| Month :        | Module/Unit:                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                               |
| October 2025   |                                                    |                                                                                                                                                                                                                                                                                                                                                                 |
| Lectures: 8    | Unit 4: Digital Modulation Techniques              | Need for digital transmission, Pulse Code Modulation: Sampling, Quantization and Encoding. Digital Modulation Techniques: Amplitude Shift Keying (ASK), Frequency Shift Keying (FSK), Phase Shift Keying (PSK), and Phase Shift Keying (BPSK and QPSK).                                                                                                         |

  
Mr. P. R. Bagade



  
Dr. C. B. Patil  
**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)

**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

**Annual Teaching Plan**

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

Programme: B.Sc. II Semester- IV

Course Code: 2MIN03ELE41

Subject: Electronics

Course Name: **Fundamentals of Operational Amplifier**

| Month :       | Module/Unit:                             | Sub-units planned                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| December 2025 |                                          |                                                                                                                                                                                                                                                                                                                                                    |
| Lectures: 8   | Unit 1: Basics of Operational Amplifier: | Transistor dc amplifier, Emitter coupled Differential amplifier, configurations of differential amplifier. Introduction to op-amp: Op-amp symbol, terminals, packages and specifications, Block diagram of op-amp, Open loop & closed loop configurations, Electrical parameters of op-amp, offset balancing technique of op-amp, study of IC 741. |
| Month:        | Module/Unit:                             | Sub-units planned                                                                                                                                                                                                                                                                                                                                  |
| January 2026  |                                          |                                                                                                                                                                                                                                                                                                                                                    |
| Lectures: 8   | Unit 2: Linear Applications              | Virtual ground concept. Op-amp as inverting and non-inverting amplifier, Voltage follower, Op-amp as adder and Subtractor, Voltage to current & current to voltage converters                                                                                                                                                                      |
| Month :       | Module/Unit:                             | Sub-units planned                                                                                                                                                                                                                                                                                                                                  |
| February 2026 |                                          |                                                                                                                                                                                                                                                                                                                                                    |
| Lectures: 8   | Unit 3: Non-linear Applications          | Differentiator and Integrator, Basic Comparators, Applications of comparator as zero crossing detectors, level detector, Schmitt triggers, Half wave Precision rectifiers, Peak detectors                                                                                                                                                          |
| Month :       | Module/Unit:                             | Sub-units planned                                                                                                                                                                                                                                                                                                                                  |
| March 2026    |                                          |                                                                                                                                                                                                                                                                                                                                                    |
| Lectures: 8   | Unit 4: Oscillators:                     | Oscillator principles, types of oscillators-Phase shift oscillator, Wien - bridge oscillator, Triangular wave generator, Square wave generator, Saw tooth wave generator.                                                                                                                                                                          |

  
Mr. P. R. Bagade



  
Dr. C. B. Patil  
**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

**Annual Teaching Plan**

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

Programme: **B.Sc. II Semester- IV**

Course Code: **2DSC03ELE41**

Subject: **Electronics**

Course Name: **Linear Integrated Circuits**

| Month : January 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                       |
|----------------------|------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures             | Practicals | Total | <b>Unit 1: Operational Amplifier</b><br><b>Practical's Group B (Op-Amp) :</b> <ol style="list-style-type: none"> <li>1. To design Op-Amp as Inverting and Non-Inverting amplifier</li> <li>2. Op-Amp as adder and Subtractor .</li> <li>3. Op-Amp as integrator and differentiator</li> <li>4. To study Op-Amp as Schmitt trigger.</li> <li>5. To study Op-Amp as comparator</li> <li>6. To design phase shift oscillator using Op-Amp</li> </ol> | Transistor dc amplifier, Emitter coupled Differential amplifier, parameters of Differential amplifier ( $A_d$ , $A_c$ , 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. |
| 8                    | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |
| Month: February 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                       |
| Lectures             | Practicals | Total | <b>Unit 2: Applications of Op-amp</b><br><b>Practical's Group B (Op-Amp):</b> <ol style="list-style-type: none"> <li>7. To design Wein bridge oscillator using Op-Amp</li> <li>8. To study Op-Amp as triangular wave generator</li> <li>9. Op-Amp as Square wave generator</li> <li>10. Op-Amp as precision rectifier.</li> </ol>                                                                                                                 | 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                                                                                                                 |
| 8                    | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |
| Month : March 2026   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                       |
| Lectures             | Practicals | Total | <b>Unit 3: Oscillators</b><br><b>Practical's Group D:</b> <ol style="list-style-type: none"> <li>1. Arithmetic instruction programming</li> <li>2. Logical instruction programming</li> <li>3. Bit manipulation instruction</li> <li>4. Code conversion using 8051</li> <li>5. Timers of 8051 in mode 1</li> <li>6. Study of timers of 8051 in mode 2</li> </ol>                                                                                  | Unit 3: Phase shift oscillator, Wien –bridge oscillator, Triangular wave generator, Square wave generator, Saw tooth wave generator.                                                                                                                                                                                    |
| 8                    | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |
| Month : April 2026   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                      | Sub-units planned                                                                                                                                                                                                                                                                                                       |
| Lectures             | Practicals | Total | <b>Unit 4: Comparators and Rectifiers</b><br><b>Practical's Group D:</b> <ol style="list-style-type: none"> <li>7. Study of counters of 8051</li> <li>8. Study of Serial programming</li> <li>9. Study of Timer Interrupts programming of 8051</li> <li>10. Study of Serial communication Interrupts programming of 8051</li> <li>11. Study of External hardware Interrupts programming of 8051</li> </ol>                                        | Basic comparator, Zero crossing detector, Schmitt trigger ,Peak detector, Clippers (positive and negative) and Clampers (positive and negative)<br>Precision rectifiers: Op-amp as precision rectifiers                                                                                                                 |
| 8                    | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                         |

Mr. P.R. Bagade

**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
VIVEKANAND COLLEGE, KOLHAPUR  
(AN EMPOWERED AUTONOMOUS INSTITUTE)





**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics  
Academic Year: 2025-26  
Annual Teaching Plan

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

Programme: **B.Sc. II Semester- III**

Course Code: **2DSC03ELE31**

Subject: **Electronics**

Course Name: **Analog and Digital Communication**

| Month : July 2025      |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                |
|------------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures               | Practicals | Total | <b>Unit 1: Electronic Communication</b><br><b>Practicals Group A:</b> <ol style="list-style-type: none"> <li>To study Amplitude Modulator and demodulator</li> <li>To study FM modulator</li> <li>Pulse Amplitude Modulation (PAM)</li> <li>To study Pulse Width Modulation</li> <li>To study ASK Modulator</li> </ol>                                                                                                                                             | 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.                                                                              |
| 8                      | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |
| Month: August 2025     |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                |
| Lectures               | Practicals | Total | <b>Unit 2: Analog Modulation- Demodulation</b><br><b>Practicals Group A:</b> <ol style="list-style-type: none"> <li>To study PSK Modulator</li> <li>To study FSK Modulator</li> <li>To study PCM</li> <li>To study PPM</li> <li>Study of Tuned Amplifier</li> </ol> <b>Practicals Group B:</b> <ol style="list-style-type: none"> <li>Addition of Two 8 Bit Numbers</li> <li>Subtraction of Two 8 Bit Numbers</li> <li>Multiplication of Two 8 Bit Num.</li> </ol> | 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 |
| 8                      | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |
| Month : September 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                |
| Lectures               | Practicals | Total | <b>Unit 3: Analog Pulse Modulation</b><br><b>Practicals Group B:</b> <ol style="list-style-type: none"> <li>Division of Two 8 Bit Numbers</li> <li>Program to transfer the memory block using 8085</li> <li>Exchange the memory blocks</li> </ol>                                                                                                                                                                                                                  | <b>Unit 3: Channel capacity, Sampling theorem, PAM, PWM, &amp; PPM.</b><br>Modulation and detection technique for PAM.                                                                                                                                                                                                                                                           |
| 8                      | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |
| Month : October 2025   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                |
| Lectures               | Practicals | Total | <b>Unit 4: Digital Pulse Modulation:</b> <ol style="list-style-type: none"> <li>Ascending and descending</li> <li>To find even and odd numbers using 8085</li> <li>To find total number of even and odd numbers in an array using 8085</li> <li>Programs for masking and to find particular given number</li> </ol>                                                                                                                                                | Need for digital transmission, PCM: Sampling, Quantization and Encoding. ASK, FSK, PSK. Phase Shift Keying (BPSK and QPSK)                                                                                                                                                                                                                                                       |
| 8                      | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                  |

Mr. P. R. Bagade



Dr. C. B. Patil  
**HEAD**

**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**



**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: **B.Sc. III Semester-V**

Course Code: **DSC03ELE53**

Subject: **Electronics**

Course Title: **Antenna and Wave Propagation**

| Month : July 2025      |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                              | Sub-units planned                                                                                                                                                                                                                                                     |
|------------------------|------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures               | Practicals | Total | Unit 1: Antenna Theory<br>GROUP A : (Instrumentation-I)                                                                                                                                                                                                                                                                                                                                   | 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                     | 16         | 28    | 1. Design of multi-range ammeter, voltmeter, conversion of ammeter voltmeter<br>2. Study of temperature sensor RTD<br>3. Automatic Porch light control using LDR and relay<br>4. Measurement of displacement -LVDT<br>5. ON/OFF Temperature controller<br>6. Study of Actuator (Solenoid)<br>7. Study of solid state relay<br><b>&amp; Project work</b>                                   |                                                                                                                                                                                                                                                                       |
| Month: : August 2025   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                              | Sub-units planned                                                                                                                                                                                                                                                     |
| Lectures               | Practicals | Total | Unit 2: Antenna Parameters<br>GROUP B: (Antenna)                                                                                                                                                                                                                                                                                                                                          | 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                     | 16         | 28    | 8. Study of simple dipole $\lambda/2$ antenna<br>9. Study of folded dipole $\lambda/2$ antenna<br>10. Study of simple dipole $\lambda/4$ antenna<br>11. Study of Yagi-Uda with 3 and 5 element simple dipole antenna.<br><b>&amp; Project work</b>                                                                                                                                        |                                                                                                                                                                                                                                                                       |
| Month : September 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                              | Sub-units planned                                                                                                                                                                                                                                                     |
| Lectures               | Practicals | Total | Unit 3: Radiating wire Structures<br>GROUP C: (Microcontroller 8051 & PLC)                                                                                                                                                                                                                                                                                                                | 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                     | 16         | 28    | 12. Study of Timers in 8051 $\mu C$<br>13. Study of LED, Switch and Relay interfacing to 8051 $\mu C$ .<br>14. LCD Interfacing with 8051 $\mu C$<br>15. DC motor interfacing to 8051<br>16. Stepper Motor interfacing to 8051<br>17. DAC0808 interfacing to 8051<br>18. ADC0804 interfacing to 8051 $\mu C$<br>19. Serial communication with PC using 8051 $\mu C$<br><b>Project work</b> |                                                                                                                                                                                                                                                                       |



| Month : October 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                  | Sub-units planned                                                                                                                                                                                                                                                                                                                                          |
|----------------------|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures             | Practicals | Total | <b>Unit 4: Radio Wave Propagation</b><br><b>GROUP C: (PLC)</b><br>20.Study of PLC Simulator (TriLOGI Software) hardware and implementing Boolean function<br>21.Programming with PLC for sequential logic RS-FF,JK-FF<br>22.Programming with PLC for sequential logic T-FF,D-FF<br>23.Study of PLC timers and counters<br><b>Project work</b> | 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                   | 16         | 28    |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                            |

  
Mr. P. R. Bagade

  
Dr. C. B. Patil  
**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**





**Vivekanand College, Kolhapur**  
(An Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: **B.Sc. III Semester- VI**

Course Code: **DSF- DSC03ELE63**

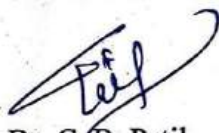
Subject: **Electronics**

Course Title: **Power Electronics**

| Month : December 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practicals | Total | <b>Unit 1: Power semiconductor devices</b><br><b>GROUP C: (Instrumentation-II)</b> <ol style="list-style-type: none"> <li>1. Function generator using IC 8038</li> <li>2. Instrumentation amplifier using OPAMP</li> <li>3. Study of active filter : Low and High Pass</li> <li>4. Study of active filter : Band Pass</li> <li>5. Study of V to F and F to V using VCO</li> </ol> <b>&amp; Project work</b>                                                                                                                    | 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                    | 16         | 28    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                |
| Month: January 2026   |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                              |
| Lectures              | Practicals | Total | <b>Unit 2: Thyristors</b><br><b>GROUP B: (Power Electronics )</b> <ol style="list-style-type: none"> <li>6. SCR firing by UJT</li> <li>7. AC Voltage controller</li> <li>8. Speed Control of DC Motor.</li> <li>9. Phase Shift control of SCR</li> <li>10. Design of Single phase full wave controlled rectifier</li> <li>11. To study the simulation of single phase HWCW with R load.</li> <li>12. To study the simulation of single phase full wave controlled bridge rectifier with R load.</li> </ol> <b>Project work</b> | 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<br><br>Diac and Triac: Basic structure, working and V-I characteristic.                                                                                                                                                       |
| 12                    | 16         | 28    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                |
| Month : February 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                              |
| Lectures              | Practicals | Total | <b>Unit 3: Controlled Rectifiers</b><br><b>Practicals:</b><br><b>GROUP D: (AVR )</b> <ol style="list-style-type: none"> <li>13. Interfacing of Switches and LED with Arduino.</li> <li>14. LCD Interfacing with Arduino</li> <li>15. Stepper Motor Interfacing with Arduino</li> <li>16. Interface temperature sensor LM35 with Arduino board</li> <li>17. Interface temp. sensor &amp; Humidity Sensor with Arduino</li> <li>18. Accelerometer Sensor Interfacing with Arduino.</li> </ol> <b>Project work</b>                | 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                    | 16         | 28    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                |

| Month : March 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Sub-units planned                                                                                                                                                                       |
|--------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures           | Practicals | Total |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                         |
| 12                 | 16         | 28    | <b>Unit 4: Power Systems</b><br><b>Practicals:</b><br><b>GROUP D: ( IoT)</b><br>19. Study the fundamental of IoT Architecture, Arduino and necessary software<br>20. Interface Bluetooth with Arduino & send the sensor data to smartphone through Bluetooth<br>21. Interface Bluetooth with Arduino and receive the data from smartphone through Bluetooth to turn LED ON/OFF<br>22. Interface Wi-Fi module with Arduino to upload sensor data.<br>23. Interface GSM module with Arduino to upload sensor data<br>24. Study and implement MQTT protocol using Arduino<br>25. IoT Application Case study: Home Automation<br><b>Project work</b> | Power Supplies: Switch mode power supply (DC): flyback, forward, half bridge and full bridge converters. Uninterrupted power supply (UPS), Electronic Ballast, Power factor correction. |

  
Mr. P.R. Bagade

  
Dr. C.B. Patil  
**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)





# Vivekanand College, Kolhapur (Empowered Autonomous Institute)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

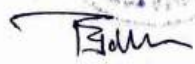
Name of the teacher: **Dr. P. S. Jadhav**

Programme: B.Sc. I Semester- I

Subject: Electronics Course Title: **2DSC03ELE12 : Digital Electronics I**

**2 DSC03ELE19 : DSC Lab-I**

| Month : July 2025     |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------|-----------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practical | Total | Lecture: Unit 1: Number System, Binary Codes and Binary Arithmetic<br>Practical's: Group A<br>1. To familiarize with basic electronic components (R, C, L, diodes, transistors), Digital Multimeter, Function Generator, power supplies and Oscilloscope etc.<br>2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope.<br>3. Verification of Thevenin's Theorem.<br>4. Verification of Kirchhoff's Laws | 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                                                                                                                                          |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Month: August 2025    |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                               |
| Lectures              | Practical | Total | Lectures : Unit 2: Logic Gates, Boolean algebra:<br>Practicals:<br>1. Verification of Norton's Theorem.<br>2. Verification of Superposition Theorem.<br>3. Study of the I-V Characteristics of P-N junction Diodes.<br>4. Study of Half wave and Full wave rectifier (centre tapped transformer/bridge)                                                                                                                         | 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), 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. |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Month: September 2025 |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                               |
| Lectures              | Practical | Total | Unit 3: Logic Families<br>Practicals:<br>1. Study of the breakdown Characteristics of Zener Diode<br>2. Study of Logic Gates<br>3. Study of Universal NAND Gate<br>4. Study of Universal NOR Gate<br>5. Study of De-Morgans Theorems                                                                                                                                                                                            | Logic Families: Types of 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                                                                                                                                                                      |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Month : October 2025  |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                               |
| Lectures              | Practical | Total | Unit 4: Combinational circuits:<br>Practicals:<br>1. Study of Half Adder and Full Adder<br>2. Study of Half and Full Subtractor<br>3. Study of BCD to seven segment Decoder<br>4. Study of Encoder<br>5. Study of Multiplexer (4:1) and De multiplexer (1:4) using IC                                                                                                                                                           | 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.                                                                                                                        |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                 |



Dr. P. S. Jadhav





**HEAD**  
Dr. C. D. Patil  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)

# Vivekanand College, Kolhapur (Autonomous)

Department of Electronics

Academic Year: 2025-26

## Annual Teaching Plan

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

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

Subject: Electronics Course code: Name: **2DSC03ELE22: Digital Electronics-II**

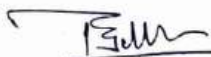
**2DSC03ELE29: DSC Lab-II**

| Month: December 2025  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practicals | Total | Unit 1: Sequential Circuit<br>Practical: Group B<br>1. Study of I-V Characteristics of JFET<br>2. Study of Input, Output and transfer Characteristics of CE configuration of BJT<br>3. Study of Voltage divider bias circuit for CE mode<br>4. Transistor as a switch<br>5. Design of a Single Stage CE amplifier of given gain | 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.                                                                                                                                          |
| 8                     | 32         | 40    |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                              |
| Month : January 2026  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                            |
| Lectures              | Practical  | Total | Unit 2: Shift registers and counters<br>Practical:<br>1. Study of the RC Phase Shift Oscillator<br>2. Study of the Wein Bridge Oscillator<br>3. Study the Colpitt's oscillator<br>4. Study the Hartley oscillator<br>5. Building and testing of RS Flip-Flop using NAND/NOR gate.                                               | Concept of register, Left shift and Right Shift operations, Types of shift registers: SISO, SIPO, PISO & PIPO (only up to 4 bits). 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. |
| 8                     | 32         | 40    |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                              |
| Month : February 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                    | Sub-units planned                                                                                                                                                                                                                                                                                                                                            |
| Lectures              | Practical  | Total | Unit 3: Data Converters<br>Practical:<br>1. Building and testing D and JK Flip-Flop using IC<br>2. Construction and study of Shift Register (serial-in and serial-out) using D-type/JK Flip-Flop ICs<br>3. Study of 3-bit Asynchronous counter<br>4. Study of 3-bit Flash ADC                                                   | 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.                                                                                                                                                           |
| 8                     | 32         | 40    |                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                              |





| Month: March 2026 |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                        | Sub-units planned                                                                                                                                            |
|-------------------|-----------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures          | Practical | Total |                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                              |
| 8                 | 32        | 40    | 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 |
|                   |           |       | Practical:<br>1. Design and study of 4 bit digital to analog converter using R-2R ladder network.<br>2. Design and study of an Astable Multivibrator using IC 555Timer.<br>3. Design and study of a Monostable Multivibrator using IC555Timer.<br>4. Design and study of a Bistable Multivibrator using IC555Timer. |                                                                                                                                                              |

  
Dr. P. S. Jadhav



  
Dr. C. B. Patil

**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: B.Sc. III Semester- V (MINOR)

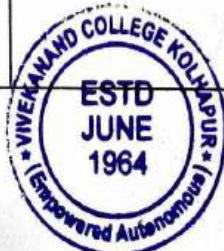
Subject: Electronics Course Title: MIN03ELE51: Fundamentals of IoT

**MIN03ELE59 (Fundamentals of Internet of Thing (IOT) Lab)**

| Month : July 2025     |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                           | Sub-units planned                                                                                                                                                                                                                                                                                |
|-----------------------|-----------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practical | Total | Lecture: Unit 1: UNIT-1: Introduction to IoT<br>1. Basics of Internet of Things: Sensors, Actuators, IoT architecture and Gateway<br>2. Introduction to Arduino UNO<br>3. Interfacing of LED to Arduino<br>4. Interfacing of LED and Relay, buzzer to Arduino<br>5. To interface LCD to Arduino                                                        | Introduction, Definitions & Characteristics of IoT, Evolution of IoT(Introduction to Industry 4.0), IoT Architecture, Physical & Logical Design of IoT : Functional Block of IoT, IoT communication Modules, IoT communication API, IoT Enabling Technologies in IoT, IoT and M2M, Applications. |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |
| Month: August 2025    |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                           | Sub-units planned                                                                                                                                                                                                                                                                                |
| Lectures              | Practical | Total | Lectures : Unit 2: Sensors & Actuators<br>Practicals:<br>1. Interfacing of Temperature and humidity sensor to Arduino<br>2. Interfacing of Soil moisture sensor to Arduino<br>3. Interfacing of ultrasonic sensor to Arduino<br>4. Interfacing of Accelerometer sensor to Arduino<br>5. Interfacing of IR sensor to Arduino                            | Over view of wireless sensor network, Sensor Characteristics, Types of sensor and working principle, Sensors used in IoT, Actuators, Types of actuators, Comparison between Sensors and Actuators                                                                                                |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |
| Month: September 2025 |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                           | Sub-units planned                                                                                                                                                                                                                                                                                |
| Lectures              | Practical | Total | Unit 3: Communication Technologies for IoT<br>Practicals:<br>1. Interfacing of PIR sensor to Arduino<br>2. Interfacing of DC Motor to Arduino<br>3. Interfacing of stepper motor to Arduino<br>4. Interfacing of servo motor to Arduino                                                                                                                | Basics of Networking (OSI Model), IEEE standards. , IoT Stack, Overview of Wireless Sensor Networks Wireless Communication Technologies: RFID, 6LoWPAN, ZigBEE, NFC, Z-wave, Bluetooth, Wi-Fi, RF, GSM/GPRS, Wired Communication Technologies: UART/USART, SPI, I2C and Ethernet                 |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |
| Month : October 2025  |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                           | Sub-units planned                                                                                                                                                                                                                                                                                |
| Lectures              | Practical | Total | Unit 4: Implementing IoT with Arduino:<br>Practicals:<br>1. Interface Bluetooth to Arduino and send data to smartphone through Bluetooth.<br>2. Interface Bluetooth to Arduino and receive data to smartphone through Bluetooth to turn LED ON/OFF<br>3. Interface ZIGBEE Module to Arduino to turn LED ON/OFF<br>4. Interface Wi-Fi module to Arduino | Implementing IoT with Arduino: Introduction to Arduino Platforms, Arduino Uno architecture, IDE setup, importing Arduino boards in Arduino IDE tool, Installation of Arduino libraries, Basics of Embedded C Programming, Interfacing of Sensors and Actuators to Arduino Uno.                   |
| 8                     | 32        | 40    |                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                  |

*Dr. P. S. Jadhav*

Dr. P. S. Jadhav



*[Signature]*  
**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Annual Teaching Plan

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

Programme: **B.Sc. III Semester- VI (MAJOR)**

Subject: Electronics Course Title: **DSE03ELE61: Internet of Things**

| Month : December 2025 |           |       | Module/Unit:                                          | Sub-units planned                                                                                                                                                                                                                                                             |
|-----------------------|-----------|-------|-------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practical | Total | Lecture: Unit 1: Introduction to IoT                  | Introduction, Definitions & Characteristics of IoT, Evolution of IoT(Introduction to Industry 4.0), IoT Architecture, Physical & Logical Design of IoT, Functional Blocks Of IoT, Enabling Technologies in IoT, IoT and M2M, Applications.                                    |
| 8                     | 00        | 08    |                                                       |                                                                                                                                                                                                                                                                               |
| Month: January 2026   |           |       | Module/Unit:                                          | Sub-units planned                                                                                                                                                                                                                                                             |
| Lectures              | Practical | Total | Lectures : Unit 2: Sensors & Actuators                | Over view of wireless sensor network, Sensor Characteristics, Types of sensor and working principle, Sensors used in IoT, Actuators, Types of actuators, Comparison between Sensors and Actuators                                                                             |
| 8                     | 00        | 08    |                                                       |                                                                                                                                                                                                                                                                               |
| Month: February 2026  |           |       | Module/Unit:                                          | Sub-units planned                                                                                                                                                                                                                                                             |
| Lectures              | Practical | Total | Lectures : Unit 3: Communication Technologies for IoT | Basics of Networking (OSI Model), IEEE standards., IoT Stack, Overview of Wireless Sensor Networks Wireless Communication Technologies: RFID,6LOWPAN, ZigBEE, NFC, Z-wave, Bluetooth, WI-Fi, RF,GSM/GPRS, Wired Communication Technologies: UART/USART, SPI, 12C and Ethernet |
| 8                     | 00        | 08    |                                                       |                                                                                                                                                                                                                                                                               |
| Month : March 2026    |           |       | Module/Unit:                                          | Sub-units planned                                                                                                                                                                                                                                                             |
| Lectures              | Practical | Total | Unit 4: Implementing IoT with Arduino                 | Implementing IoT with Arduino: Introduction to Arduino Platforms, ArduinoUno architecture, IDE setup, importing Arduino boards in Arduino IDE tool,Installation of Arduino libraries, Basics of Embedded C Programming, Interfacing of Sensors and Actuators to Arduino Uno   |
| 8                     | 00        | 08    |                                                       |                                                                                                                                                                                                                                                                               |

  
Dr. P. S. Jadhav



  
Dr. C. B. Patil

**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**

# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

Annual Teaching Plan

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

Programme: B.Sc. III Semester- VI (MINOR)

Subject: Electronics Course Title: MIN03ELE61: IoT System Design

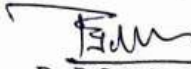
MIN03ELE69 (IoT System Design Lab)

| Month : December 2025 |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|-----------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practical | Total | Lecture: Unit 1: UNIT I: IoT Protocols<br>Practicals:                                                                                                                                                                                                                                                                                                                                          | IoT Protocols: Internet and Web layering (Overview of the OSI Model), IoT protocols - MQTT, MQTT-SN, Constrained Application Protocol (CoAP), HTTP, STOMP, AMQP, Comparison of IPv4 and IPv6 protocols.                                                                                                                                                                |
| 8                     | 32        | 40    | 1. Introduction to ESP 8266<br>2. Creation Of Things Speak Account/Blynk<br>3. Interfacing of Temperature and humidity sensor to ESP 8266 and upload sensor data to thing speak cloud<br>4. Interfacing of Temperature and humidity sensor to ESP 8266 and retrieve sensor data from thing speak cloud                                                                                         |                                                                                                                                                                                                                                                                                                                                                                        |
| Month: January 2026   |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                      |
| Lectures              | Practical | Total | Lectures : Unit 2: Cloud Platforms<br>Practicals:                                                                                                                                                                                                                                                                                                                                              | Evolution of Cloud Computation, Commercial clouds and their features, open source IoT platforms, cloud dashboards, Interfacing and data logging to cloud: Blynk, Thing speak, platforms.<br>Virtualization concepts and Cloud Architecture, Cloud computing, benefits ,Cloud services -- SaaS, PaaS, IaaS , Cloud providers & offerings , Study of IOT Cloud platforms |
| 8                     | 32        | 40    | 1. Interfacing of ultrasonic sensor to ESP 8266 and upload sensor data to thing speak cloud<br>2. Interfacing of Accelerometer sensor to ESP 8266 and upload sensor data to thing speak cloud<br>3. Interfacing of Soil moisture sensor to ESP 8266 and upload sensor data to thing speak cloud<br>4. Interfacing of ultrasonic sensor to ESP 8266 and upload sensor data to thing speak cloud |                                                                                                                                                                                                                                                                                                                                                                        |
| Month: February 2026  |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                      |
| Lectures              | Practical | Total | Unit 3: Basic Networking with ESP8266<br>Practicals:                                                                                                                                                                                                                                                                                                                                           | Basics of Wireless Networking, Introduction to ESP8266 Wi-Fi Module ,Various Wi-Fi library , Web server- introduction, installation, configuration ,Posting sensor(s) data to web server.                                                                                                                                                                              |
| 8                     | 32        | 40    | 1. Interfacing of IR sensor to ESP 8266 and upload sensor data to thing speak cloud<br>2. Interfacing of PIR sensor to ESP 8266 and upload sensor data to thing speak cloud<br>3. Interface ZIGBEE Module to ESP 8266 to turn LED ON/OFF                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                        |
| Month : March 2026    |           |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                   | Sub-units planned                                                                                                                                                                                                                                                                                                                                                      |
| Lectures              | Practical | Total | Unit 4: IoT Case Studies                                                                                                                                                                                                                                                                                                                                                                       | Home Automation, Agriculture,                                                                                                                                                                                                                                                                                                                                          |





|   |    |    |                                                                                                                                                                                                                                                                                     |                                              |
|---|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| 8 | 32 | 40 | <b>Practicals:</b> <ol style="list-style-type: none"> <li>1. Interface Bluetooth to Arduino and Study and implement MQTT protocol using ESP 8266</li> <li>2. LED control using ESP 8266 via web (http protocol)</li> <li>3. IOT Application Case study: Home Automation.</li> </ol> | Health Care, Industrial Automation, Logistic |
|---|----|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|

  
Dr. P. S. Jadhav



  
Dr. C. B. Patil

**HEAD**  
**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Teaching Plan

Name of the teacher: Mr. G. B Jirage

Programme: B.Sc. Part-I, Part-II and Part-III

Semester- I and V

Subject: Electronics

Course Title: Analog Electronics -I

| Month : July 2025      |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------|------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures               | Practicals | Total | <b>UNIT 1: Basic Circuit Elements</b><br><b>Practicals:</b><br>1. To familiarize with basic electronic components (R, C, L, diodes, transistors), Digital Multimeter, Function Generator, power supplies and Oscilloscope etc.<br>2. Measurement of Amplitude, Frequency & Phase difference using Oscilloscope<br>3. Verification of Kirchhoff's Laws<br>4. Study of Logic Gates<br>5. Study of Universal NAND Gate<br>6. Study of Universal NOR Gate | Study of basic circuit elements and passive components: Resistor, Capacitor, Inductor, Transformer, Relays, Switches                                                                                                                                                                                                                                                                                                                      |
| 08                     | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Month: August 2025     |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Lectures               | Practicals | Total | <b>UNIT 2: Circuit Analysis:</b><br><br><b>Study of De-Morgans Theorems</b><br><b>Study of Half Adder and Full Adder</b><br><b>Study of Half and Full Subtractor</b><br><b>Study of BCD to seven segment Decoder</b><br><br><b>Practicals:</b><br>4. Verification of Thevenin's Theorem<br>5. Verification of Norton's Theorem<br>6. 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,<br><br>Construction of PN junction, Formation of Depletion Layer, Barrier potential, Forward and Reverse bias, Diode Equation and I-V characteristics, |
| 08                     | 32         | 40    |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Month : September 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                                                                                          | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Lectures               | Practicals | Total |                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                           |





|                      |            |       |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------|------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 08                   | 32         | 40    | <b>UNIT 3: PN Junction Diode:</b><br>:<br>1. Arithmetic and logical operations using 8051 microcontroller.<br>2. Switch and Relay interfacing to 8051 microcontroller.<br>3. DC motor interfacing to 8051 microcontroller.<br>4. Study of Timers in 8051 Microcontroller.<br>5. Stepper Motor interfacing to 8051 microcontroller.                                                  | 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.<br><br>Need of Power Supply, Block diagram of DC regulated power supply, Rectifiers: Half wave, Full wave rectifiers (center tapped and bridge):- Circuit diagrams, working and waveforms, ripple factor, PIV, efficiency and TUF. Filter-Shunt capacitor filter, Series inductor filter, $\pi$ - filter. Regulation: |
| Month : October 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                                                        | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Lectures             | Practicals | Total |                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 08                   | 32         | 40    | <b>UNIT 4: DC Power Supply</b><br>7. Study of the I-V Characteristics of P-N junction Diodes<br>8. Study of the a) breakdown Characteristics of Zener Diode<br>b) Zener Diode as voltage regulator.<br>9. Study of Half wave and Full wave rectifier (centre tapped transformer /bridge)<br>10. Study of Encoder<br>11. Study of Multiplexer (4:1) and Demultiplexer (1:4) using IC | 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..                                                                                                                                                                                                                                                                      |

  
 Mr. G. B. Jirage



  
 Dr. C. B. Patil  
**HEAD**  
 DEPARTMENT OF ELECTRONICS  
 VIVEKANAND COLLEGE, KOLHAPUR  
 (EMPOWERED AUTONOMOUS)

# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Teaching Plan

Name of the teacher: Mr. G. B Jirage

Programme: B.Sc. Part-I, Part-I and Part-III

Semester- II and VI

Subject: Electronics

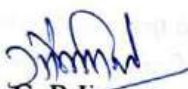
Course Title: Analog Electronics -II

| Month : Dec 2025 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                  | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures         | Practicals | Total | <b>UNIT 1: Bipolar Junction Transistor</b><br><br><b>Practicals: GROUP B :</b><br><b>Group D:</b><br>1. Interfacing of Switches and LED with Arduino/AVR microcontroller.<br>2. LCD Interfacing with Arduino/AVR microcontroller.<br>3. Stepper Motor Interfacing with Arduino/AVR microcontroller.                                           | 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 $\alpha$ and $\beta$ . Relations between $\alpha$ and $\beta$ , dc load line and Q point (Operating point), Significance of Q-point.                                                                                                                                                  |
| 08               | 32         | 40    |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Month: Jan 2026  |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                  | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Lectures         | Practicals | Total | <b>UNIT 2: Unipolar Devices</b><br><br>4. Interface temperature sensor LM35 with Arduino board and display temperature on LCD.<br>5. Interface temperature sensor Humidity Sensor (DHT11) with Arduino/AVR board and display temperature and humidity values on LCD.<br>6. Accelerometer Sensor Interfacing with Arduino/AVR microcontroller. | 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.                                                                                                                                                                                                                                                                                                                           |
| 08               | 32         | 40    |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Month : Feb 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                                                                                  | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Lectures         | Practicals | Total | <b>UNIT 3: Amplifiers:</b><br><b>Practicals:</b><br><b>GROUP B:</b><br>1. Arithmetic Operation using uP8085 – I.<br>2. Arithmetic Operation using uP8085 – II.<br>3. Block transfer using uP8085.                                                                                                                                             | 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.<br><br>Need of transistor Biasing, Transistor biasing and Stabilization circuits- Fixed Bias and Voltage Divider Bias. Thermal runaway, stability and stability factor $S_v$ , Class A, B, AB and C Amplifiers (Comparative Study on the basis of Q point), Single stage CE amplifier: Current gain, Voltage gain, Power gain, input and output |
| 08               | 32         | 40    |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |





|                    |            |       |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |
|--------------------|------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    |            |       |                                                                                                                                                                                                                                                                                     | resistances, frequency Response.<br>Cascaded Amplifiers: Two stage RC, LC, TC<br>and DC Coupled Amplifiers and their<br>Frequency Responses, Concept of Differential<br>amplifier and its advantages                                                                               |
| Month : march 2026 |            |       | Module/Unit:                                                                                                                                                                                                                                                                        | Sub-units planned                                                                                                                                                                                                                                                                  |
| Lectures           | Practicals | Total |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |
| 08                 | 32         | 40    | <b>UNIT 4: Feedback Amplifier<br/>and Oscillators:</b> <ol style="list-style-type: none"> <li>1. Study of temperature sensor<br/>RTD and Thermistors</li> <li>2. Function generator using IC<br/>8038</li> <li>3. Automatic Porch light control<br/>using LDR and relay.</li> </ol> | Concept of feedback, negative and positive<br>feedback, advantages of negative feedback<br>(Qualitative only).<br>Oscillators: Barkhausen criterion for sustained<br>oscillations. Phase shift, Wein Bridge, Hartley<br>and Colpitt's oscillator .UJT as relaxation<br>oscillator. |

  
Mr. G. B. Jirage



  
Dr. C. B. Patil

**HEAD**  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Teaching Plan

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

Programme: B.Sc. Part-I,

Subject: Electronics (Open Elective)

Semester- I

Course Title: Electric Wiring -I

| Month : July 2025  |            |       | Module/Unit:                                                                                                                                                                                              | Sub-units planned |
|--------------------|------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Lectures           | Practicals | Total | Practicals:                                                                                                                                                                                               |                   |
| 00                 | 32         | 32    | 1) Study of electrical components<br>2) Identification of Different wires<br>3) Introduction of tools, Electrical materials, Symbols and abbreviation meter                                               |                   |
| Month: August 2025 |            |       | Module/Unit:                                                                                                                                                                                              | Sub-units planned |
| Lectures           | Practicals | Total | 4) Introduction to electrical safety precautions<br>5) To study meters(DC and AC meters, Multimeter, megger, Energy meter)<br>6) Verification of equivalent resistances in series and parallel connection |                   |
| 00                 | 32         | 32    |                                                                                                                                                                                                           |                   |
| Month : Sept 2025  |            |       | Module/Unit:                                                                                                                                                                                              | Sub-units planned |
| Lectures           | Practicals | Total | Practicals:                                                                                                                                                                                               |                   |
| 00                 | 32         | 32    | 7) Verification of equivalent capacitance in series and parallel combination<br>8) Study of transformer<br>9) Verification of ohm's law                                                                   |                   |
| Month : Oct 2025   |            |       | Module/Unit:                                                                                                                                                                                              | Sub-units planned |
| Lectures           | Practicals | Total |                                                                                                                                                                                                           |                   |
| 00                 | 32         | 32    | Practicals:<br>10)Verification of Kirchoff's laws(KCL and KVL)<br>11)To study measurement of voltage, current and power in RL and RLC Circuit<br>12)Measurement of energy using single phase energy meter |                   |

Mr. G. B. Jirage

Dr. G. B. Patil

DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Teaching Plan

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

Programme: B.Sc. Part-I,

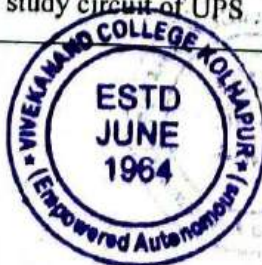
Subject: Electronics (Open Elective)

Course Title: Electric Wiring -II

Semester- II

| Month :Dec 2025    |            |       | Module/Unit:                                                                                                                                                                                                 | Sub-units planned |
|--------------------|------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Lectures           | Practicals | Total | Practicals:                                                                                                                                                                                                  |                   |
| 00                 | 32         | 32    | 1. Measurement of resistance to earth using an electrical equipment (Megger)<br>2. To make different joints on wire (straight joint, T-joint, Britannia joint )<br>3. To Study types of switches and holders |                   |
| Month: Jan 2026    |            |       | Module/Unit:                                                                                                                                                                                                 | Sub-units planned |
| Lectures           | Practicals | Total |                                                                                                                                                                                                              |                   |
| 00                 | 32         | 32    | 4. To wire up a circuit with one lamp controlled by one switch<br>5. To wire up a circuit with two lamp controlled by one switch<br>6. To wire up a circuit with two lamp controlled by two switch           |                   |
| Month : Feb 2026   |            |       | Module/Unit:                                                                                                                                                                                                 | Sub-units planned |
| Lectures           | Practicals | Total | Practicals:                                                                                                                                                                                                  |                   |
| 00                 | 32         | 32    | 7. To wire up a circuit to control three lamps by using one SP switch<br>8. To wire up a circuit to control one lamp from two place using two way switches (staircase wiring)<br>9. To study Godown wiring   |                   |
| Month : March 2026 |            |       | Module/Unit:                                                                                                                                                                                                 | Sub-units planned |
| Lectures           | Practicals | Total |                                                                                                                                                                                                              |                   |
| 00                 | 32         | 32    | 10. To study fuses, MCBs and importance of Earthing<br>11. To study circuit of SMPS<br>12. To study circuit of UPS                                                                                           |                   |

  
Mr. G. B. Jirage



  
Dr. C. B. Patil  
HEAD

DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)

# Vivekanand College, Kolhapur (Empowered Autonomous)

Department of Electronics

Academic Year: 2025-26

## Teaching Plan

Name of the teacher: Mr. G. B Jirage

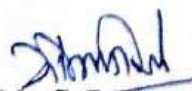
Programme: B.Sc. Part-III

Subject: Electronics

Semester- V

Course Title: Programmable logic Controller (PLC)

| Month : July 2025      |            |       | Module/Unit:                      | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|------------|-------|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures               | Practicals | Total | UNIT 1 : Basics of control system | Introduction, Open loop system, Close loop transfer system, comparison of closed-loop system and open-loop control system, feedback and Feed-forward control system                                                                                                                                                                                                                                                                                                                                     |
| 03                     | -          | 12    |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Month: August 2025     |            |       | Module/Unit:                      | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Lectures               | Practicals | Total | UNIT 2: Controllers               | Introduction to controllers, Properties of controller, Classification of controllers: Two position mode controller (ON-OFF), Proportional mode controller(P), Integral controller(I), Derivative controller(D), Proportional Integral controller(PI), Proportional Derivative controller(PD) and Proportional Integral Derivative controller (PID)                                                                                                                                                      |
| 03                     | -          | 12    |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Month : September 2025 |            |       | Module/Unit:                      | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Lectures               | Practicals | Total | Unit 3: Introduction to PLC       | 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<br>Industrial Communication Buses: RS485, Profibus Distributed control system, DCS components/block diagram, SCADA, adaptive control system                                                                                               |
| 03                     | -          | 12    |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Month : October 2025   |            |       | Module/Unit:                      | Sub-units planned                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Lectures               | Practicals | Total | UNIT 4: Ladder Programming basics | Basic components: fuse, pushbutton, selector switches, limit switches, indicators, relay, time delay 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.<br>Ladder Programming: Programs for Boolean logic and flip-flops, counters, timers, flasher. Application program Bottle filling plant, elevator control, washing machine control |
| 03                     | -          | 12    |                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

  
Mr. G. B Jirage



  
Dr. C. B. Patil  
HEAD  
DEPARTMENT OF ELECTRONICS  
VIVEKANAND COLLEGE, KOLHAPUR  
(EMPOWERED AUTONOMOUS)



**Vivekanand College, Kolhapur (Empowered Autonomous Institute)**

Department of Electronics

Academic Year: 2025-026

**Annual Teaching Plan**

Name of the teacher: **Mr. R. A. Deshmukh**

Program: **B.Sc. III Semester-V**

Course Code: **2DSC03ELE51**

Subject: Electronics

Course Title: **FUNDAMENTLAS OF INSTRUMENTATION**

| Month: July 2025      |             |       | Module / Unit                                                                                                              | Sub-Units Planned                                                                                                                                                                                                                                                                                                                                                                                                |
|-----------------------|-------------|-------|----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures              | Practical's | Total | Unit-1 Fundamental of Measurement                                                                                          | Introduction, Performance characteristics, Static and Dynamic characteristics of Instruments, Error: Type of Errors (Gross error, systematic error, and random error) Impedance loading and matching, Calibrations: Definition and classification, Standards of measurement: Definition and types of Standards                                                                                                   |
| 8                     | 32          | 40    | Practical's:<br>1. Design of multi-range ammeter, voltmeter, conversion of ammeter into voltmeter                          |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Month: August 2025    |             |       | Module / Unit                                                                                                              | Sub-Units Planned                                                                                                                                                                                                                                                                                                                                                                                                |
| Lectures              | Practical's | Total | Unit-2: Basic Analog Measuring Instruments                                                                                 | DC galvanometer, PMMC and Moving Iron instruments, Voltmeter, Ammeter, RMS and True RMS concept, extending range of ammeter, Design of multi-range ammeter, extending range of voltmeter, Design of multi-range voltmeter, Series and shunt type ohmmeter, Single phase wattmeter: construction and working                                                                                                      |
| 8                     | 32          | 40    | Practical's:<br>2. Study of temperature sensor RTD and Thermistor                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Month: September 2025 |             |       | Module / Unit                                                                                                              | Sub-Units Planned                                                                                                                                                                                                                                                                                                                                                                                                |
| Lectures              | Practical's | Total | Unit-3: Transducers                                                                                                        | Definition, Classification of Transducers, Selection criterion for Transducers, Detail study of Transducers: Thermistor, RTD, Thermocouple, Semiconductor sensor (LM 35/AD590), Strain gauge, LVDT, Capacitive transducer (microphone), Opto-electric transducer – LDR, Photo diode, PIR, Ultrasonic sensor, Hall effect sensor, Loud Speaker, Piezoelectric transducer, Proximity sensor: Inductive, capacitive |
| 8                     | 32          | 40    | Practical's:<br>3. Automatic Porch light control using LDR and relay                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Month: October 2025   |             |       | Module / Unit                                                                                                              | Sub-Units Planned                                                                                                                                                                                                                                                                                                                                                                                                |
| Lectures              | Practical's | Total | Unit-4: Actuators                                                                                                          | Definition, Principle, types and selection of Actuators, linear, rotary, logical, and continuous Actuators, Electrical actuating systems: Solid-state switches, Relays, Solenoids, Electric Motors: Principle of operation, Electro-mechanical: Servo, DC motor, Stepper motor                                                                                                                                   |
| 8                     | 32          | 40    | Practical's:<br>4. Measurement of displacement using LVDT<br>5. Study of ON/OFF Temperature Controller (LM 34/LM 35/AD590) |                                                                                                                                                                                                                                                                                                                                                                                                                  |

Mr. R. A. Deshmukh



Dr. C. B. Patil

**HEAD**

**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**

**Vivekanand College, Kolhapur (Empowered Autonomous Institute)**  
**Department of Electronics**  
**Academic Year: 2025-026**  
**Annual Teaching Plan**

Name of the teacher: **Mr. R. A. Deshmukh**

Program: **B.Sc. III Semester-VI**

Course Code: **2DSC03ELE61**

Subject: **Electronics**

Course Title: **INDUSTRIAL INSTRUMENTATION**

| Month: January 2026  |             |       | Module / Unit                                    | Sub-Units Planned                                                                                                                                                                                                                                            |
|----------------------|-------------|-------|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures             | Practical's | Total | Unit-1 Signal Conditioning-I                     |                                                                                                                                                                                                                                                              |
| 8                    | 32          | 40    | Practical's:<br>1. Study of Actuators (Solenoid) | Introduction, Sample and Hold circuit, Thermistor, Wheatstone bridge amplifier, Instrumentation amplifier, Attenuator, Converter: V-I, I-V, V-F and F-V                                                                                                      |
| Month: February 2026 |             |       | Module / Unit                                    | Sub-Units Planned                                                                                                                                                                                                                                            |
| Lectures             | Practical's | Total | Unit-2: Signal Conditioning-II                   |                                                                                                                                                                                                                                                              |
| 8                    | 32          | 40    | Practical's:<br>2. Study of solid-state relay    | Introduction to Passive and active filter, Advantages of active filters over passive filters, Study of filter response (Butterworth, Chebyshev.) Different types of active filters, Study and design of low pass, high pass, band pass and band stop filters |

| Month: March 2026 |             |       | Module / Unit                                                                                                                                   | Sub-Units Planned                                                                                                                                                                                                                                                            |
|-------------------|-------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lectures          | Practical's | Total | Unit-3: Digital Instruments                                                                                                                     |                                                                                                                                                                                                                                                                              |
| 8                 | 32          | 40    | Practical's:<br>3. Function generator using 8038<br>4. Instrumentation amplifier using OPAMP                                                    | Introduction to Data Acquisition System (DAS), Single channel & multi-channel DAS. Data logger, digital instruments like Digital Multimeter, Digital Tachometer, Digital Capacitance Meter, Digital Phase Meter, Digital Frequency Meter, Digital pH Meter.                  |
| Month: April 2026 |             |       | Module / Unit                                                                                                                                   | Sub-Units Planned                                                                                                                                                                                                                                                            |
| Lectures          | Practical's | Total | Unit 4: Application of Linear ICs                                                                                                               |                                                                                                                                                                                                                                                                              |
| 8                 | 32          | 40    | Practical's:<br>5. Study of active filter: Low and High pass<br>6. Study of active filter: Band Pass<br>7. Study of V to F and F to V using VCO | Block diagram of PLL with functioning of each block, calculation of capture range and lock range frequencies, application of PLL (frequency multiplier, FM modulator, frequency synthesizer and FSK), Study of IC 565, Study of function generator IC 8038, Study of VCO 556 |



**Mr. R. A. Deshmukh**




**Dr. C. B. Patil**

**HEAD**

**DEPARTMENT OF ELECTRONICS**  
**VIVEKANAND COLLEGE, KOLHAPUR**  
**(EMPOWERED AUTONOMOUS)**