**LESSON PLAN**

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| **Name of Faculty MANISHA GOEL** | | | |
| **Electrical Engineering** | | | |
| **4th sem** | | | |
| **Programmable logic controllers and Microcontrollers** | | | |
| **from 15/01/2024 to 30/05/2024** | | | |
| **Week** | | **Theory/Practical- 3/4** | | |
| **Topic** | **Practical day** | **Topic** | |
| 1st | | Fundamentals of PLC Introduction, | 1st | 1. Introduction to PLC building blocks and Ladder Programming. | |
| Definition and advantage; |
| Building blocks of PLC: CPU, Memory organization, |
| 2nd | | Input- output modules (discrete and analog), Specialty I/O Modules, Power supply; I/O module selection criteria; | 2nd | 2. Installation and programming using OpenPLC. | |
| Interfacing different I/O devices with appropriate I/O modules |
| Revision of Unit I |
| 3rd | | Class test No.1 | 3rd | 3. Logic operations in PLC using ladder language e.g. AND, OR, NOT etc. | |
| PLC Instructions and Programming, |
| PLC programming Instructions: Relay type instructions, |
| 4th | | Timer instructions: On delay, off delay, retentive, counter instructions: | 4th | 4. Timers and Counters instructions in PLC using ladder language. | |
| Up, Down, High speed, Logical instructions |
| Comparison Instructions, Data handling Instructions, |

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| 5th | Simple Programming examples using ladder logic: | 5th | 5. Sequence control system e.g. in lifting a device for packaging and counting. |
| Arithmetic instructions. Language based on relay, timer counter, |
| logical, comparison, arithmetic and data handling instructions. |
| 6th | Class test No.02 | 6th | 6. Use of PLC in any two applications (teacher may decide): a) Traffic Lights System b) Doorbell Operation c) Home Automation d) Sorting of Objects |
| Applications of PLC |
| PLC Based Applications: |
| 7th | Motor sequence control, Motor in forward and reverse direction | 7th | 7. Demonstration and comparison of various 8051/8052 microcontrollers. |
| StarDelta, DOL Starters Traffic light control, |
| , Elevator control, Conveyor system, |
| 8th | Stepper motor control, packaging etc. | 8th | 8. Introduction to 8051 programming using C. |
| Class test no.03 |
| Architecture of Microcontroller 8051 |

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| 9th | Difference between micro processor and micro controller, |  | 9. Testing of GPIO on Micro controller board using C |
| Block diagram of 8051, |
| function of each block, |
| 10th | Pin diagram, function of each pin | 10th | 10. Interfacing of 7 segment LED with 8051 using C sensors: |
| Concept of Internal memory and External memory (RAM and ROM), Internal RAM structure, |
| Reset and clock circuit, Various registers and SFRs of 8051 |
| 11th | Class Test No 04 | 11th | . 11. Interfacing of 4x3/4x4 Keypad with 8051 using C. |
| Microcontroller Instruction |
| Programming Instruction set |
| 12th | Addressing modes: | 12th | 12. Any three application circuits using 8051/8052 (teacher may decide): a) Car Parking with Counter b) Temperature controlled Fan c) RTC based digital clock d) Agriculture Automation using Humidity, Soil Moisture and Temperature |
| Timer operation, Serial Port operation, interrupts |
| Data Transfer operations, |
| 13th | Input/output operations. | 13th | File Checking and Viva Voice |
| Design and Interface: keypad interface, |
| 7- segment interface, LCD, stepper motor; applications. |
| 14th | Class Test No.05 | 14th | File Checking and Viva Voice |
| Revison of PLC |
| Revison of Microcontroller 8051 |
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| 15th | Discussion of previous year HSBTE question  papers | 15th | Internal Practical viva voce |
| Class test  Discussion of previous year HSBTE question  papers |
| Revision of complete syllabus |