**Govt. Polytechnic Shergarh, Kaithal**

 **Deptt. Of Electrical Engineering**

Lesson plan

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| Name of the faculty : | Deepender Gill |  |  |
| Discipline : | Electrical Engg. |  |  |
| Semester : | 5th |  |  |
| Subject : | Programmable logic controllers and Microcontrollers |  |
| Lesson Plan Duration: | 15 weeks(15/02/2024 june 2024) |  |  |
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| **Work load (Lecture/Practical) per week : Lectures-03, Practicals-04hrs per group** |  |
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| **Week** | **Theory** | **Practical** |
| **Lecture day** | **Topic** | **Practical day** | **Topic** |
| 1st  | 1 | Introduction PLC, concept of PLC | 1st | Components/ subcomponents of a PLC and learning functions of different modules of a PLC system |
| 2 | Building blocks of PLC |
| Functions of various blocks of PLC |
| 3 | Limitations /Advantages of PLCs over electromagnetic relays |
| Different programming languages,  |
| 2nd  | 1 | PLC manufacturers and applications of PLC | 1st | Practical steps in programming a PLC using hand held programmer/Computer Interfacing |
| Assignment/Class Test of chapter 1 |
| 2 | Basic operation of PLC |
| Principles of PLC |
| 3 | Architectural details of Processor-Part-I |
| 3rd  | 1 | Architectural details of Processor-Part-II | 1st | Introduction to step 5 programming language, ladder diagram concepts, instruction list syntax |
| Memory Structures |
| 2 | Input/output structures |
| Programming Terminals of PLC |
| 3 | Power supply to PLC |
| 4th  | 1 | Assignment/Query/Revision ch 2 | 1st | Basic logic operations, AND, OR, NOT functions |
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| 2 | Basic instructions for latch |
| Master control self holding relays |
| 3 | Timer instructions-ON and OFF delay |
| 5th  | 1 | Retentive timers, resetting of timers | 1st | Revision |
| Counter instructions like up counter, down counter, resetting of counters |
| 2 | Arithmetic Instructions (ADD, SUB, DIV, MUL etc.) |
| 3 | MOV instruction, RTC (Real Time Clock function) |
| Comparison instructions like equal, not equal, greater, greater than equal, less than, less than equal |
| 6th  | 1 | Programming on Basic instructions | 1st | Use/Programming of PLC for Fan Control |
| Programming on Timer instructions |
| 2 | Revision of Ch 3 |
| Queries/Practice Ch 3 |
| 3 | Quiz Ch 3 |
| 7th  | 1 |  | 1st | Use/Programming of PLC for Traffic light system |
| Programming on Sequencer instructions |
| 2 | Programming on comparison instructions |
| Revision of Ladder diagram Programming  |
| 35 | Simple program practice |
| 8th  | 1 | Assembly line, Packaging, Process control | 1st | Use/Programming of PLC for motor Control |
| Car parking, Doorbell operation, Traffic light control |
| 2 | Microwave oven, Washing machine, Motor in forward and reverse direction |
| 3 | Star delta, DOL Starter, paint industry ,filling of bottles, room Automation |
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| 9th  | 1 | SCADA System Overview | 1st | Revision |
| Block Diagram of SCADA and Applications |
| 2 | Microcontroller -Overview |
| Block diagram and architecture of Microcontroller |
| 3 | Overview of MCS-51 |
| 10th  | 1 | 8051 -Pin details | 1st | Familiarization with the study of architecture of 8085 kit, basic sub systems and input output connectors, function keys |
| Input port structures |
| 2 | Output port structures |
| Memory organisation |
| 3 | Special function registers |
| 11th  | 1 |  | 1st | Testing of general input/output on microcontroller board |
| Instruction set of MCS-51 |
| 2 | Addressing modes  |
| Timer operation |
| 3 | Serial port operation and communication |
| 12th  |  1 | Interrupts and its types | 1st | Basic Programs (Addition/Subtraction) |
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|  2 | Assemblers operations & compilers |
| 3 | Assembler directives |
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| 13th  | 1 | keypad interfacing  | 1st | Controlling of LEDs using microcontroller program |
| 7- segment interface, LCD |
| 2 | Stepper motor interfacing  |
| A/D, D/A interfacing |
| 3 | RTC interfacing |
| 14th  | 1 | Introduction of PIC Micro controllers | 1st | Revision |
| Features of PIC 16C84 |
| 2 | Architecture of PIC 16C84 |
| Revision and class test |
| 3 | Applications of microcontrollers |
| 15th | 1 | Revision and class test | 1st | Internal Viva -Voce |
| Queries of complete syllabus |
| 2 | Revision of complete syllabus |
| 3 | Solving previous year HSBTE question papers  |
| Solving previous year HSBTE question papers |