**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 | |