Siemens S7-300 with STEP 7 Course Modules

Programmable Logic Controller (PLC), The advent of the PLC began in the 1970s, and has become the most common choice for manufacturing controls.

PLC advantages

- **Cost effective for controlling complex systems.**
- **Flexible and can be reapplied to control other systems quickly and easily.**
- **Computational abilities allow more complicated control.**
- **Trouble shooting aids make programming easier and reduce downtime.**
- **Reliable components make these likely to operate for years before failure.**

Modules 1: (hours 36)	
1. **PLC history & what is plc?** 2. **Simatic product overview** 3. **Training demo unit** 4. **Simatic manager software** 5. **Hardware configuration** 6. **Blocks & programing language** 7. **Symbol table** 8. **Numbering system** 9. **Timers.** 10. **Counters.** 11. **Binary & logic operation**	12. **Math Operation.** 13. **Declaration Table.** 14. **Data Block.** 15. **Function Blocks & Organization Blocks.** 16. **Analog Modules.** 17. **Troubleshooting & Diagnostic** 18. **MPI Communication.** 19. **Case studies.**

Modules 1 detail:

1. PLC history & what is plc?

- History of PLC
- Comparison of PLC with Other Control Systems
- Advantages of PLCs
- Basic Elements of Control System
- Switch circuit types
- Sensors
- Electromagnetic relay
- Contactor
- Circuit breakers
- Digital control
- Digital systems
- Logic signals
- Logic gate symbols
- Input and outputs
- Type of logic gates
- Electrical circuit symbo

2. Simatic product overview

- Overview On Simatic S7 Product.
- Familiar With S7-200, S7-300 & S7-400.
- Different Between Siemens Programming Device.

3. Training demo unit

4. Simatic manager software

- Understand Simatic Manger.
- Understand Project Instruction.
- Be Familiar With Step7 Software.
- How To Cerate New Projects

5. Hardware configuration

- Know How Insert Hardware Configuration (CPU, DI-DO, AI-AO ……)
- How To Change The Signal Module Address.
- Know The CPU Properties.
- Know How to Save, Compile, Upload, Download Logic Software.

6. Blocks & programing language

- What Is The Difference Between S7 Blocks
- Understand The Process Image & Cyclic Execution.
- How To Insert, Edit S7 Blocks.

- Know Different S7 Programming Language & How To Select Them.
- Know How To Download, Save, Monitor S7 Blocks.
- Know How To Call The FB & FC Blocks In OB1.

7. Symbol table

- Know How To Create, Edit The Symbol Table.
- Be Familiar With The Symbol Table Functions (Sort, Filter , Import, Export)

8. Binary & logic operation

- Review On The Logic Gates & How It Is represented In LAD, STL, FBD
- Know The Set-Reset Functions.
- Know The Pulse Edge & Mid-Line Coil.
- Know The Jump Condition.
- Conversion command.
- Comparison command.
- Rotate / shift command.

9. Numbering system

- Know The Different Numbering System.
- Know The Integer, Double Integer, Real Formats & How It Is Used.

10. Timers.

- TON On – delay timer
- TOFF Off – delay timer
- TMR Integrating timer
- TMON Monostable timer
- TRTG Retrigerrable timer

11. Counters.

- CTU Up counter
- CTD Down counter
- CTUD Up-down counter
- CTR Ring counter

12. Math Operation.

- Understand The Math Operation & How To Use It In Different Language.

13. Declaration Table.

- Know How Temp. Variables Can Be Accessed & Where It Stored.
- Understand The Declaration Table & How To Use It.

14. Data Block.

- Know The Elementary & Complex DB.
- How To Create DB.
- Familiar With Addressing & Accessing Data Element.

15. Function Blocks & Organization Blocks.

- How To Create FB & Its Instant DB.
- Know What Is OB & What Is Available.
- What Is The Difference Between Complete Reset & Warm Reset.
- Understand The Interrupt Processing.

16. Analog Modules.

- Know Analog Value Processing.
- Set The Measuring Range Module.
- Assign Parameters To Analog Modules
- Use Standard Function For Scaling

17. Learn How to Classify Errors.

- Module Information & Diagnostic Buffer.
- Detect Error Through Stacks.
- Hardware Diagnostic Through Hardware Configuration.
- Variable Table & Cross Reference.
- Track Errors Through Blocks (Go To & Compare).

18. Know Communication Methods.

- Configure GD Communication Files.

19. Case Studies.

- Garage Parking problem.
- ATS (Automatic transfer switch).
- Zebra crossing.
- Advertising board.
- Elevator 4fl.