

Siemens S7-300 PLC Programming with SIMATIC Manager — Beginner Level

Course Description

This beginner-level course introduces participants to **Siemens S7-300 PLC programming using SIMATIC Manager (STEP 7 Classic)**. The training starts with basic PLC concepts and gradually moves toward hardware configuration, ladder logic programming, timers, counters, Analog signals and troubleshooting.

The course emphasizes **hands-on exercises and industrial applications**, making it suitable for participants with little or no prior PLC programming experience.

Target Audience

- Beginners in PLC and industrial automation
- Electrical & Electronics Engineers
- Instrumentation Engineers
- Automation Engineers
- Maintenance Engineers and Technicians
- Fresh Engineering Graduates
- Professionals transitioning into PLC programming

Prerequisites

- Basic electrical/ electronic knowledge
- Basic understanding of industrial control systems
- No prior PLC programming experience required
- Familiarity with computers and Windows

MODULES

Module 1: Introduction to PLC & S7-300

- What is a PLC?
- PLC vs conventional control
- PLC applications in industry
- Siemens PLC family overview

- Introduction to S7-300
- CPU, Power Supply and I/O modules
- Digital vs Analog I/O
- Basic PLC terminology

Module 2: SIMATIC Manager & STEP 7

- Introduction to SIMATIC Manager
- STEP 7 Classic environment
- Creating a new project
- Project structure
- Adding an S7-300 station
- Basic hardware configuration
- Saving and organizing a project

Module 3: S7-300 Hardware Configuration

- Selecting the CPU
- Configuring power supply
- Adding DI/DO modules
- Adding AI/AO modules
- Understanding I/O addresses
- CPU properties
- Compiling hardware configuration
- Downloading configuration to PLC

Module 4: Basic PLC Programming

- PLC scan cycle
- Introduction to Ladder Logic (LAD)
- Normally Open and Normally Closed contacts
- Coils
- AND/OR logic
- Basic start/stop circuit

- Set and Reset instructions
- Simple motor control exercise

Module 5: Timers & Counters

- Introduction to timers
- Timer applications
- Introduction to counters
- Up/down counting concepts
- Practical timer and counter exercises

Module 6: Basic PLC Program Organization

- Introduction to FC
- Introduction to FB
- Data Blocks (DB)
- Calling blocks
- Symbolic addressing
- Creating a simple structured program

Module 7: Analog Signals

- Digital vs Analog signals
- 0–10 V and 4–20 mA
- Analog input modules
- Understanding raw values
- Basic scaling
- Monitoring temperature, pressure or level
- Simple analog control exercise

Module 8: Monitoring & Troubleshooting

- Online/offline mode
- Monitoring ladder logic
- Monitoring PLC variables
- Forcing and modifying values

- CPU RUN/STOP
- Diagnostic buffer
- Identifying hardware faults
- Basic troubleshooting methodology