Siemens Mechatronic Systems Certification Program — Level 1 / 2 / 3 (SMSCP)

OEM: Siemens • Duration: 10 Days (80 hrs) • Code: SMSCP

COURSE MODULES & TOPICS

SAPW: Systems Approach Paradigm Week (5 days)

- Systems Approach philosophy and SMSCP program overview
- Hands-on exercises with mechatronic systems, modules, and sub-systems
- Block diagrams and function descriptions: energy, mass, and information flow
- Creation of function charts for simulated systems
- Troubleshooting strategies using Diagnostic Kit
- Creation of sample lessons utilizing the Systems Approach
- Introduction to VCAT online content distribution platform

Level 1 — Electrical Components

- Basic elements and quantities; circuit diagrams and schematics
- Measurements; energy sources; actuators and sensors
- Overcurrent protection; safety issues
- Preventive maintenance and troubleshooting of electrical components

Level 1 — Mechanical Components and Electrical Drives

- Mechanical systems for energy flow: gears, bearings, fasteners, couplings, clutches
- Basics of electrical drives (AC and DC)
- Technical documentation and safety
- Preventive maintenance and troubleshooting of mechanical components

Level 1 — Electro-Pneumatic and Hydraulic Control Systems

- Electropneumatic control systems, function diagrams, and circuit diagrams
- Actuation of pneumatic cylinders and directional control valves
- Sequence control systems and displacement-step diagrams
- Hydraulics: pressure transfer, flow rate, solenoid-activated directional control valves

Level 1 — Digital Fundamentals and PLCs (SIMATIC S7)

- Function and design of a programmable logic controller (PLC)
- Number systems and digital logic; PLC configuration

- Basic fundamentals of STEP 7 programming language
- Testing and simulation of a PLC program
- Troubleshooting of PLC hardware

Level 2 — Process Control, TIA, Motor Control, Mechanics, Manufacturing

- Process Control Technologies (PID, ON/OFF, closed-loop control)
- Introduction to Totally Integrated Automation (TIA) with analogue values and PROFIBUS
- Motor Control (starting methods, drives, encoders, motor protection)
- Mechanics and Machine Elements (statics, kinetics, rolling contact bearings, gears)
- Manufacturing Processes (process management simulation, CNC, CAD/CAM, student design project)

Level 3 — Project and Engineering Design

- Project and Process Management (requirements engineering, quality assurance)
- Engineering Mechatronic System Project (complete technical design project)
- Application of Level 3 systems design knowledge