

PLC Curriculum Mapping Pack

A starting-point mapping of a browser-based PLC programming curriculum to your programme competencies.

Note: "PLC" here means **Programmable Logic Controller** (industrial automation) — ladder logic, timers, counters, I/O, motor control, HMI, robotics, IEC 61131-3, troubleshooting and safety — not a Professional Learning Community.

Read first. This is an instructor's starting-point mapping, written in generic, publicly-documented competency language. It is our own interpretation of how the platform lines up with common programme competency themes — not an official crosswalk, endorsement, or accreditation by any awarding body, college, apprenticeship sponsor, or standards organisation. Adapt and verify it against your own accredited programme outcomes before you rely on it.

Community college / associate degree

Industrial Automation & Electrical Technology programmes

Associate-degree and certificate programmes in Industrial Automation, Electrical/Electronics Technology, and Automation Technology commonly publish course-level competencies around PLC fundamentals, I/O, ladder logic, timers/counters, motor control, HMI/operator interfaces, and troubleshooting. Below is how the platform maps to those common competency themes — generic wording, our interpretation, adapt to your own course outcomes.

COMPETENCY THEME (GENERIC)	HOW THE PLATFORM COVERS IT	ASSESSMENT / EVIDENCE
PLC fundamentals: hardware, CPU, I/O modules, scan cycle	PLC Basics module — "What is a PLC", architecture, the scan cycle, addressing	Auto-graded intro scenarios + knowledge checks
Ladder logic programming: contacts, coils, seal-in / latching	Ladder Logic core lessons — NO/NC contacts, output coils, seal-in motor-start rung	Auto-graded ladder scenarios (per-test pass/fail)
Timers and counters (on-delay, off-delay, up/down)	Timers (TON/TOF/RTO) and Counters (CTU/CTD) lessons + traffic-light and conveyor-count scenarios	Auto-graded timing & counting scenarios
Discrete and analog I/O; field-device wiring concepts	Digital & Analog I/O lessons, sinking/sourcing, 4–20 mA scaling; PLC wiring labs	Auto-graded I/O scenarios + wiring lab checks
Motor control: start/stop, jog, reversing, sequencing	Motor Control module — star-delta, reversing, multi-step machine sequencing scenarios	Auto-graded motor-control machine scenarios
Operator interfaces (HMI) and SCADA concepts	HMI Builder module — screens, widgets, alarms bound to PLC tags; SCADA concept lessons	HMI build exercises + HMI Designer certificate
Systematic troubleshooting and fault diagnosis	Troubleshooting module — fault-injection scenarios, structured diagnosis workflow	Auto-graded fault-finding scenarios
Programming standards (IEC 61131-3) and vendor dialects	IEC 61131-3 lessons (LD/FBD/ST/SFC/IL); Allen-Bradley, Siemens, Mitsubishi & more dialect switching	Auto-graded structured-text & dialect exercises
Safety concepts and fail-safe design	Safety lessons — NC E-stops, fail-to-safe state, guard logic within scenarios	Safety-graded scenario criteria

Mechatronics technician

Mechatronics / NC II–IV-style competency areas

Mechatronics technician qualifications (including national-certificate / NC II–IV-style competency areas and similar mechatronics-technician frameworks) typically group competencies into PLC programming & integration, sensors & actuators, electrical control, HMI/operator interface, and robotics/automated systems. The mapping below uses that generic competency-area language — our

interpretation, to be adapted to the specific units you deliver.

COMPETENCY THEME (GENERIC)	HOW THE PLATFORM COVERS IT	ASSESSMENT / EVIDENCE
Programmable controllers: install, program, integrate	PLC Basics + Ladder Logic + IEC 61131-3 modules across the structured path	Auto-graded programming scenarios + PLC technician certificate
Sensors, actuators and signal interfacing	Digital/Analog I/O lessons, sinking/sourcing sensors, 4–20 mA actuators & scaling	Auto-graded I/O & scaling scenarios
Electrical control circuits and motor control	Motor Control module — start/stop, reversing, star-delta, interlocks	Auto-graded motor-control scenarios
Sequential control and machine logic	Multi-step machine scenarios (conveyor sort, batching, traffic sequencing); SFC concepts	Auto-graded multi-step machine scenarios
Human-machine interface (HMI) design and operation	HMI Builder — multi-screen projects, widgets, alarm subsystem bound to tags	HMI build exercises + HMI Designer certificate
Industrial robotics and automated cells	Robot Simulator module — UR-style & SCARA cells, jog, motion programming, safety grading	Auto-graded robot lessons + Robot Programming certificate
Industrial communications and SCADA concepts	Comms & SCADA concept lessons (Modbus, networked I/O, tag binding)	Concept knowledge checks + HMI/SCADA exercises
Fault diagnosis, maintenance and safety	Troubleshooting module + safety/fail-safe lessons embedded across scenarios	Auto-graded fault-finding + safety-graded criteria

Industrial-maintenance apprenticeship

Related / supplemental instruction topics

Industrial-maintenance and automation apprenticeship pathways (including registered-apprenticeship and workforce-grant-funded programmes such as AJAC/WIOA-style related-instruction outlines) commonly list related-instruction topics like PLC fundamentals, ladder logic, I/O, motor control, and troubleshooting. The platform is well suited as the practice-and-evidence layer for that related instruction. The mapping below uses generic related-instruction topic language — our interpretation, not an official apprenticeship standard.

COMPETENCY THEME (GENERIC)	HOW THE PLATFORM COVERS IT	ASSESSMENT / EVIDENCE
PLC fundamentals (related instruction)	PLC Basics module — controller hardware, scan cycle, addressing, free intro lessons	Auto-graded intro scenarios
Ladder logic and relay-replacement logic	Ladder Logic core lessons — contacts, coils, seal-in, interlocks	Auto-graded ladder scenarios
Input/output devices and wiring	Digital/Analog I/O lessons + PLC wiring labs (port/terminal practice)	Auto-graded I/O scenarios + wiring lab checks
Timers, counters and process sequencing	Timers/Counters lessons + sequencing machine scenarios	Auto-graded timing/counting/sequencing scenarios
Motor control and electrical control circuits	Motor Control module — start/stop, reversing, star-delta starters	Auto-graded motor-control scenarios
Troubleshooting and predictive fault-finding	Troubleshooting module — fault-injection scenarios, structured diagnosis	Auto-graded fault-finding scenarios

COMPETENCY THEME (GENERIC)	HOW THE PLATFORM COVERS IT	ASSESSMENT / EVIDENCE
Operator interfaces and plant safety	HMI Builder + safety/fail-safe lessons across scenarios	HMI exercises + safety-graded scenario criteria
Evidence of competency for the apprentice record	Timestamped, name-attributed completions; portfolio PDF export; certificates	Portfolio PDF + PLC technician / HMI / robot certificates

Want this mapped to your exact programme outcomes? Visit plcsimulationsoftware.com/plc-curriculum-mapping and tell us your qualification, unit codes, and cohort size — we'll help line the platform up against them.

Generated 23 Jun 2026 — an instructor's starting-point mapping, our interpretation only, with no official endorsement or accreditation by any body. — Paul, plcsimulationsoftware.com