

# Automation Engineers

An Automation Engineer designs, develops, and implements intelligent systems that streamline industrial processes and reduce human intervention. In the automotive sector, this role is essential for integrating advanced technologies such as PLCs, SCADA systems, robotics, IIoT, and AI into manufacturing environments. These professionals are responsible for optimising production lines by programming automation logic, configuring sensors and actuators, and ensuring seamless system interoperability. Their work directly contributes to increasing productivity, reducing operational errors, and improving energy efficiency.

Core responsibilities include designing automation architectures, developing control algorithms, troubleshooting system failures, and collaborating with multidisciplinary teams to ensure compliance with safety and performance standards.

In the current context of Industry 4.0 and 5.0, Automation Engineers are at the forefront of digitalisation.

## ESCO Mapping

<https://esco.ec.europa.eu/select-language?destination=/node/1>

| ID         | NAME                | Concept URI                                                                                                                                                         |
|------------|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2141.4.2.1 | Automation Engineer | <a href="http://data.europa.eu/esco/occupation/bb609566-3ab6-44dd-8f48-cf0b15b96827">http://data.europa.eu/esco/occupation/bb609566-3ab6-44dd-8f48-cf0b15b96827</a> |

## Context

|             |                            |
|-------------|----------------------------|
| EQF Level   | 6/7                        |
| Departments | Production and Maintenance |

| ID       | Name                                           | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Level | ESCO |
|----------|------------------------------------------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| C00<br>3 | Optimise energy efficiency in automation       | Skill     | <p>Optimise automated systems to minimise energy consumption and support sustainable production practices.</p> <ul style="list-style-type: none"> <li>▪ Analyse energy usage across automated systems to detect inefficiencies</li> <li>▪ Implement control strategies that reduce energy waste</li> <li>▪ Configure energy monitoring tools</li> <li>▪ Optimise start/stop cycles and idle times</li> <li>▪ Support energy-saving initiatives via automation</li> </ul>                                                         | 3     |      |
| C00<br>4 | Eco-design in automation                       | Knowledge | <p>Explain eco-design principles for selecting sustainable components and designing environmentally responsible systems.</p> <ul style="list-style-type: none"> <li>▪ Identify automation solutions that reduce lifecycle environmental impact</li> <li>▪ Support component selection for energy and material efficiency</li> <li>▪ Understand how modular design improves recyclability</li> <li>▪ Promote circular economy principles in automation</li> <li>▪ Evaluate materials in line with eco-innovation goals</li> </ul> | 2     |      |
| C00<br>5 | Apply sustainable manufacturing via automation | Skill     | <p>Apply automation technologies to enable sustainable, resource-efficient manufacturing operations.</p> <ul style="list-style-type: none"> <li>▪ Implement control systems that reduce raw material consumption</li> <li>▪ Monitor production KPIs for environmental compliance</li> <li>▪ Use automation to track waste and enable recycling</li> <li>▪ Reconfigure systems to lower environmental impact</li> <li>▪ Collaborate in sustainability audits and projects</li> </ul>                                              | 3     |      |

| ID       | Name                      | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Level | ESCO |
|----------|---------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| C05<br>6 | AI integration            | Knowledge | <p>Explain how artificial intelligence is applied in automation systems to increase efficiency and autonomy.</p> <ul style="list-style-type: none"> <li>▪ Describe how AI models support predictive maintenance and quality control</li> <li>▪ Identify suitable machine learning algorithms for automation contexts</li> <li>▪ Evaluate AI system adaptability to changing production needs</li> <li>▪ Understand collaboration between automation and data science teams</li> </ul> | 2     |      |
| C05<br>7 | Implement IIoT systems    | Skill     | <p>Design and integrate Industrial Internet of Things (IIoT) solutions into automation infrastructures.</p> <ul style="list-style-type: none"> <li>▪ Integrate IIoT sensors and devices for real-time process monitoring</li> <li>▪ Configure data flows between IIoT devices and automation platforms</li> <li>▪ Troubleshoot IIoT connectivity and data reliability issues</li> <li>▪ Collaborate across teams to ensure IIoT system interoperability</li> </ul>                    | 2     |      |
| C05<br>8 | IIoT systems architecture | Knowledge | <p>Explain the structure, configuration, and performance monitoring of scalable IIoT systems.</p> <ul style="list-style-type: none"> <li>▪ Describe architectures for data flow and device management in IIoT networks</li> <li>▪ Identify KPIs and diagnostic methods to assess IIoT performance</li> <li>▪ Understand cybersecurity threats in IIoT environments</li> <li>▪ Recognise integration strategies for legacy systems</li> </ul>                                          | 2     |      |
| C05<br>9 | Program robotics          | Skill     | <p>Write, test, and optimise code for robotic systems used in automation processes.</p> <ul style="list-style-type: none"> <li>▪ Develop algorithms to control robotic movements and tasks</li> <li>▪ Debug robotic code to ensure accuracy and reliability</li> <li>▪ Integrate sensor feedback into robotic programs</li> </ul>                                                                                                                                                     | 3     |      |

| ID   | Name                       | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                                         | Level | ESCO                 |
|------|----------------------------|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|
|      |                            |           | <ul style="list-style-type: none"> <li>Collaborate with mechanical teams to align robotic behaviour with operational needs</li> </ul>                                                                                                                                                                                                                                                                                               |       |                      |
| C060 | Program automation systems | Skill     | <p>Develop and maintain code to automate industrial machinery and control systems.</p> <ul style="list-style-type: none"> <li>Use languages like Python, STL, or C++ to develop automation logic</li> <li>Debug and optimise automation scripts for performance and safety</li> <li>Integrate automation code into broader production systems</li> <li>Coordinate with control engineers to implement reliable solutions</li> </ul> | 3     |                      |
| C052 | Control systems            | Knowledge | <p>Explain the components and logic of control systems used in industrial automation.</p> <ul style="list-style-type: none"> <li>Describe PLC/DCS configurations and I/O logic</li> <li>Identify common control faults and corrective actions</li> <li>Analyse performance metrics to improve control stability</li> <li>Calibrate and tune systems to meet operational targets</li> </ul>                                          | 3     | <a href="#">Link</a> |
| C061 | Sensor technologies        | Knowledge | <p>Understand how sensors are selected, calibrated, and interpreted in automation systems.</p> <ul style="list-style-type: none"> <li>Select appropriate sensors for industrial applications</li> <li>Calibrate and maintain sensors for accurate measurement</li> <li>Analyse sensor faults and ensure optimal performance</li> <li>Interpret real-time sensor data to support decision-making</li> </ul>                          | 3     |                      |
| C062 | Integrate actuators        | Skill     | <p>Configure and troubleshoot actuators to execute controlled mechanical actions in automation.</p> <ul style="list-style-type: none"> <li>Select actuators (pneumatic, hydraulic, electric) for process requirements</li> <li>Configure speed, force, and response parameters</li> <li>Troubleshoot performance issues and adjust settings</li> </ul>                                                                              | 3     |                      |

| ID   | Name               | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                                              | Level | ESCO |
|------|--------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
|      |                    |           | <ul style="list-style-type: none"> <li>▪ Monitor actuator behaviour to prevent failures and downtime</li> </ul>                                                                                                                                                                                                                                                                                                                          |       |      |
| C063 | Robotics platforms | Knowledge | <p>Explain how robotic platforms are designed and configured to meet task-specific automation needs.</p> <ul style="list-style-type: none"> <li>▪ Describe configuration approaches for assembly, handling, or inspection tasks</li> <li>▪ Optimise platform performance for accuracy and efficiency</li> <li>▪ Identify hardware/software issues in robotic platforms</li> <li>▪ Align robotic systems with production goals</li> </ul> | 2     |      |

## Soft Skills

| ID   | Name          | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                          | Level | ESCO                 |
|------|---------------|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|
| C127 | Communication | Knowledge | <p>Explain technical concepts clearly and appropriately to both technical and non-technical stakeholders.</p> <ul style="list-style-type: none"> <li>▪ Prepare concise reports and presentations on automation projects</li> <li>▪ Interpret and respond to feedback from colleagues and clients</li> <li>▪ Promote knowledge-sharing across departments</li> <li>▪ Adapt communication to audience needs</li> </ul> | 2     | <a href="#">Link</a> |
| C128 | Work in teams | Skill     | <p>Collaborate effectively with cross-functional teams to deliver automation solutions.</p> <ul style="list-style-type: none"> <li>▪ Share knowledge to foster a supportive environment</li> <li>▪ Assist colleagues in troubleshooting systems</li> <li>▪ Contribute constructively to team discussions</li> <li>▪ Value diverse perspectives during collaboration</li> </ul>                                       | 2     | <a href="#">Link</a> |

| ID       | Name                          | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                               | Level | ESCO                 |
|----------|-------------------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|
| C12<br>9 | Solve problems                | Skill     | <p>Identify and resolve complex automation issues using analytical and creative thinking.</p> <ul style="list-style-type: none"> <li>▪ Analyse root causes of technical faults</li> <li>▪ Develop and test multiple solutions</li> <li>▪ Apply troubleshooting techniques in real time</li> <li>▪ Collaborate with peers to overcome obstacles</li> </ul>                                                 | 2     | <a href="#">Link</a> |
| C13<br>0 | Attention to detail           | Knowledge | <p>Ensure precision and accuracy in the design and operation of automation systems.</p> <ul style="list-style-type: none"> <li>▪ Detect inconsistencies in code or system behavior</li> <li>▪ Review scripts and configurations thoroughly</li> <li>▪ Validate system performance through testing</li> <li>▪ Document processes to maintain quality standards</li> </ul>                                  | 2     | <a href="#">Link</a> |
| C13<br>1 | Collaborate with stakeholders | Skill     | <p>Engage in active collaboration with colleagues and stakeholders to align automation efforts with objectives.</p> <ul style="list-style-type: none"> <li>▪ Communicate regularly with teams to share updates</li> <li>▪ Contribute ideas to improve automation strategies</li> <li>▪ Provide constructive feedback in team settings</li> <li>▪ Build strong relationships across departments</li> </ul> | 2     | <a href="#">Link</a> |
| C13<br>2 | Develop creative solutions    | Skill     | <p>Develop innovative automation approaches to solve technical challenges.</p> <ul style="list-style-type: none"> <li>▪ Propose novel solutions to optimise workflows</li> <li>▪ Explore emerging technologies to improve systems</li> <li>▪ Brainstorm ideas with teams for system upgrades</li> <li>▪ Apply creative thinking to overcome constraints</li> </ul>                                        | 2     | <a href="#">Link</a> |

| ID   | Name                            | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                        | Level | ESCO |
|------|---------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| C168 | Technical documentation         | Knowledge | <p>Understand how to read, create, and manage technical documentation used in automation.</p> <ul style="list-style-type: none"> <li>▪ Interpret technical drawings, wiring diagrams, and schematics</li> <li>▪ Document maintenance procedures and safety protocols</li> <li>▪ Standardise documentation formats and terminology</li> <li>▪ Ensure traceability and compliance in system documentation</li> </ul> | 2     |      |
| C169 | Coordinate projects             | Skill     | <p>Plan, monitor, and communicate tasks and milestones within automation projects.</p> <ul style="list-style-type: none"> <li>▪ Define project phases related to automation systems</li> <li>▪ Track progress and manage dependencies</li> <li>▪ Communicate risks and updates to technical teams</li> <li>▪ Support project reporting and stakeholder alignment</li> </ul>                                        | 2     |      |
| C170 | Optimise processes              | Skill     | <p>Analyse and improve industrial processes using automation-based strategies.</p> <ul style="list-style-type: none"> <li>▪ Identify bottlenecks in automated workflows</li> <li>▪ Propose changes to improve throughput and reduce cycle times</li> <li>▪ Implement control logic to minimise downtime</li> <li>▪ Assess ROI of process modifications</li> </ul>                                                  | 2     |      |
| C171 | Health and safety in automation | Knowledge | <p>Understand safety principles and regulations applicable to automated systems.</p> <ul style="list-style-type: none"> <li>▪ Identify hazards related to robotic and control systems</li> <li>▪ Apply ISO/IEC safety standards (e.g. ISO 12100, IEC 61508)</li> <li>▪ Support risk assessments and documentation</li> <li>▪ Collaborate on safe system design</li> </ul>                                          | 2     |      |

| ID       | Name                               | Type  | Description                                                                                                                                                                                                                                                                                                                                           | Level | ESCO |
|----------|------------------------------------|-------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|------|
| C17<br>2 | Interpret data for decision-making | Skill | Use system and process data to support technical decision-making. <ul style="list-style-type: none"> <li>▪ Analyse KPIs, alarms, and logs from automated systems</li> <li>▪ Use dashboards and HMIs to monitor production</li> <li>▪ Recommend actions based on real-time data trends</li> <li>▪ Communicate insights to engineering teams</li> </ul> | 2     |      |

## Sector Specific

| ID       | Name                          | Type      | Description                                                                                                                                                                                                                                                                                                                                                                                                                                          | Level | ESCO                 |
|----------|-------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----------------------|
| C22<br>9 | Electricity principles        | Knowledge | Core concepts of electricity and electrical engineering applied in automation systems. <ul style="list-style-type: none"> <li>▪ Describe electrical quantities and circuit behaviour</li> <li>▪ Interpret control panel diagrams and symbols</li> <li>▪ Analyse electrical faults in automated equipment</li> <li>▪ Apply safety and grounding procedures</li> </ul>                                                                                 | 3     | <a href="#">Link</a> |
| C22<br>7 | Industrial automation systems | Knowledge | Explain how to design, integrate, and monitor industrial automation systems to support production. <ul style="list-style-type: none"> <li>▪ Integrate control systems, sensors, and actuators to enable automated workflows</li> <li>▪ Troubleshoot system-level faults to maintain performance</li> <li>▪ Interpret process data to optimise production efficiency</li> <li>▪ Align automation systems with safety and quality standards</li> </ul> | 2     |                      |