

IIoT Specialists

The IIoT Specialist plays a critical role in the automotive sector by designing, implementing, and managing Industrial Internet of Things (IIoT) systems that connect sensors, devices, and platforms to enable intelligent manufacturing environments. Their core activities include developing communication protocols, configuring and maintaining sensor networks, managing data flow between edge and cloud environments, and supporting predictive analytics. They also address cybersecurity, data governance, and real-time system optimisation.

Key responsibilities include integrating sensors into IIoT architectures, ensuring connectivity and interoperability between components, applying data analytics tools to enhance system performance, and maintaining compliance with industry standards. Essential competences span digital (e.g. programming, data management, network protocols), green (e.g. energy-efficient sensor deployment), and transversal skills (e.g. analytical thinking, cross-functional collaboration).

Their work supports the shift toward smart factories and the connected vehicle ecosystem, enabling scalable, secure, and responsive systems in both production and product development.

ESCO Mapping

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

ID	NAME	Concept URI
2512.9	IoT developer	http://data.europa.eu/esco/occupation/6ce5f7e3-a534-4aa2-ab23-255408ddb53a

Context

EQF Level	5-6
Departments	IT & Digital

Green Competences

ID	Name	Type	Description	Level	ESCO
C016	Design energy-efficient systems	Skill	Design IIoT systems that minimise energy use and environmental impact. ▪ Optimise sensor network architecture for low power consumption. ▪ Select components based on energy ratings. ▪ Configure communication protocols to reduce bandwidth usage. ▪ Apply power-saving modes in embedded systems.	2	

Digital Competences

ID	Name	Type	Description	Level	ESCO
C078	Program systems	Skill	Design IIoT systems that minimise energy use and environmental impact. ▪ Optimise sensor network architecture for low power consumption. ▪ Select components based on energy ratings. ▪ Configure communication protocols to reduce bandwidth usage. ▪ Apply power-saving modes in embedded systems.	2	Link
C065	Use data analysis tools	Skill	Use digital tools to analyse and visualise data generated by IIoT devices. ▪ Apply Python or Power BI to extract trends. ▪ Use Tableau or Excel for dashboards. ▪ Run statistical models for predictive maintenance. ▪ Clean and transform datasets for use in analytics.	2	
C079	Manage data	Skill	Manage the collection, storage, and transmission of IIoT data. ▪ Implement data pipelines from edge to cloud. ▪ Organise databases for query efficiency. ▪ Apply data governance best practices. ▪ Pre-process and clean raw data inputs.	2	Link

ID	Name	Type	Description	Level	ESCO
C080	IoT protocols	Knowledge	Explain how communication protocols support device interconnectivity. ▪ Identify appropriate protocols (MQTT, CoAP, HTTP). ▪ Explain bandwidth and latency implications. ▪ Describe the use of Zigbee and LoRa for low-power transmission. ▪ Compare TCP/IP and UDP use cases.	2	
C058	IIoT systems architecture	Knowledge	Describe the components and structure of IIoT systems. ▪ Explain hardware/software stack from sensor to cloud. ▪ Describe device lifecycle management. ▪ Identify design principles for real-time performance. ▪ Explain how to monitor and diagnose system behaviour.	3	
C081	Integrate sensors	Skill	Integrate, calibrate, and optimise sensor performance in IIoT environments. ▪ Connect sensors (temperature, motion, etc.) to IIoT nodes. ▪ Calibrate and validate sensor accuracy. ▪ Troubleshoot connectivity and noise issues. ▪ Configure for low power and high reliability.	2	

Soft Skills

ID	Name	Type	Description	Level	ESCO
C137	Apply analytical thinking	Skill	Break down complex problems and apply logic to develop effective solutions. ▪ Identify root causes of system inefficiencies. ▪ Apply logic to protocol and connectivity challenges. ▪ Predict failure patterns using historical data. ▪ Evaluate impacts of solutions.	2	Link

ID	Name	Type	Description	Level	ESCO
C12 3	Collaborate in teams	Skill	Work effectively across teams and stakeholders in IIoT development. ▪ Communicate with software, hardware, and ops teams. ▪ Explain technical choices to non-experts. ▪ Coordinate with suppliers of sensors and platforms. ▪ Contribute to agile sprints and updates.	2	Link

Transversal Competences

ID	Name	Type	Description	Level	ESCO
C16 4	Solve technical problems	Skill	Solve technical and integration issues in IIoT systems. ▪ Diagnose communication faults between layers. ▪ Test and adjust embedded configurations. ▪ Restore service in real-time system failures. ▪ Apply structured troubleshooting techniques.	2	Link