

# Automation and Robotics Skills Bootcamp

## Course Aim

Many companies use automation and robotic systems to run industrial facilities such as food manufacturing & processing, chemical & pharmaceutical production plants, low carbon power generation plants including wind turbines, paper production, and nuclear processing and decommissioning. These automated systems require specialist technicians and engineers to commission, design, operate and maintain them. The aim of this course is to enable learners to develop knowledge and an understanding of automation and robotic systems, with a particular reference to local and regional applications and demand within Cumbria. The course develops a fundamental understanding of control systems theory to then enable the application and implementation of robotics, programmable logic controllers, computer programming and industrial networks for automation.

The course will also provide learners with an opportunity to develop hands on skills with programming and fault finding automation devices.

## Course Learning Outcomes

1. Describe control system theory in engineering
2. Program and apply programmable logic controllers in automated systems
3. Describe how sensors and actuators are used in automation control systems
4. Describe how industrial network systems are used within automation systems
5. Explain the methods of maintenance used within automation systems
6. Program and apply robotics in automation systems

## Schedule

- A blend of face to face day release classes & practical's supported by on line materials.
- A single week block of 4 days for robotics and robot programming

Day release (9 am to 4 pm) – Starting Friday 23rd Sept 2022 completing Friday 16th December 2022 (12 weeks)

Block release – week beginning 24th October 2022 (Tuesday to Friday)

Assessment will take place during the last two weeks of the course.

## Employer Costs

Skills Bootcamps are a great way to build sector specific skills in your workforce. Plus, you only need to pay a small contribution:

- Large employer at 30% contribution. This is fantastic value for money with a 70% reduction.
- Micro, Small and Medium employer at 10%. This is fantastic value for money with a 90% reduction.

# Automation and Robotics Skills Bootcamp

## Course Content

- Open & closed-loop control systems operation and applications
- Control system characteristics & responses
- Programming and application of embedded control systems, i.e. Programmable Interface Controllers (PICs) and Programmable Logic Controllers (PLCs)
- Basic architecture of a PLC (e.g. inputs, outputs, counters, timers, programming)
- Role of sensors and actuators in a control system (e.g. sensor detects an object's position on an assembly line; actuator controls movement of an arm to pick up the object)
- Types of sensors, analogue, digital, switches, proximity sensors, laser, vision systems
- Applications of sensors for measurement; position, speed, temperature, flow, level, pressure
- Applications of actuators; solenoids, hydraulic, pneumatic, electrical motors
- Requirements of industrial network systems; topology, protocols, data transmission
- Common industrial communication standards; CAN bus, process field bus (profibus), device net, supervisory control and data acquisition (SCADA)
- Application of human machine interfaces (HMI)
- Maintenance in automation control systems, maintenance strategies in automation control systems, traditional time interval maintenance, condition based maintenance, statistical process control (SPC)
- Characteristics of a robot, on-line and off-line robot programming
- Robot arms; cartesian, cylindrical, polar, articulate
- End effectors; tools, grippers
- Application of common types of industrial robot; Cartesian, SCARA, Mobile (AGVs)
- Programming robot arms

## Learner Costs

The training is free if you meet the following criteria:

- Aged over 19 years of age
- Working, recently unemployed within the last 12 months or looking for work e.g. coming back into the workforce after a career break
- Resident in the UK and legally entitled to work in the UK

## Contact Us

Scan the QR code, visit our website ([www.lcwc.ac.uk](http://www.lcwc.ac.uk)) or email [admissions@lcwc.ac.uk](mailto:admissions@lcwc.ac.uk) for more information!

