

Robotics Training and Qualifications

An Opportunity for Colleges

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The Skillman Project

- A European funded project to develop new qualifications in technical areas where there are gaps currently across Europe
- Three partner countries: UK, Denmark and Italy
- Brings together vocational education partners, awarding organisations and industry in each partner country
- Qualifications must be levels 3, 4 or 5
- Three year project – now at end year 2

The Partners

- Denmark – working with SAS Airlines on qualifications in composite materials
- Italy – IT – big data
- UK – robotics with Jaguar Land Rover, their supply chain and the awarding organisation EAL

An overview of the Robotic skills within an organisation

Safety Engineer

- Programming safely
- Commission safely
- Safe equipment set up and monitoring of safety functionality
- Collision monitoring

Joining Engineer

- Rivet / spot weld application
- What pressure to apply in joining process
- orientation of programming
- Understanding of Joining process etc (laser welding...)

Controls Engineer

- PLC and logic control
- Bus Networks and Protocols
- PLC and Safety Bus
- PLC Programming protocols

Pneumatics Engineer

- Air Logic
- Pneumatic drawings

Mechanical Engineer

- Mechanical skills and experience
- Motor gear box alignment
- Weights and force

Fault Finding Engineer

- Analytical Problem solving
- Investigations using data
- Techniques and process to identify faults

Environmental Engineer

- Aware of energy usage
- Optimise paths and Process
- Use of Air / Power understanding

Layout Engineer

- Robot relative to job
- Orientation in car line
- Reach and payload

Process Engineer

- Cycle time
- Cyclograms
- Process `understanding`



Design Engineer

- Writing new code for new procedures and processes
- Imaginative and creative

Virtual Engineer

- OLP (off line programming)
- Catia and robot path modelling
- Operation of off line packages

What's a `Typical` Robot Engineer ?

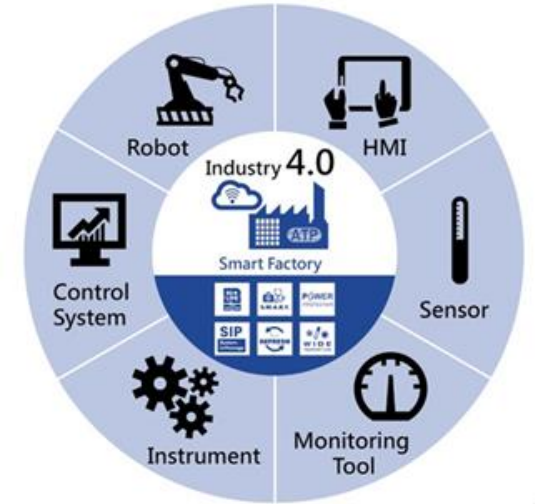
The Robotics skills challenges and opportunities

Two to Three jobs will be created by every robot in use, and two to three more for downstream jobs (IRF Study)

- Ability to diagnose
- Ability to repair
- Ability to programme
- Level of general ICT skills, positive correlation between ICT and skill level
- Level of general STEM subjects

The global advanced manufacturing market is predicted to double in size to £750 billion by 2020, largely driven by developments in new technologies. The UKCES report 'Skills and performance challenges in the advanced manufacturing sector' warns that **the advances achieved through automation are at risk if the right people with the right skills are not available to support them.**

The Robotics skills challenges



Skills needed to run a “smart factory”

Estimated rise in the use of collaborative robotics brings challenges

Project Aims for the UK

- Developing a Level 3 qualification in robotics
- Delivery of short courses to the automotive supply chain to enhance skills
- Developing knowledge about the skills of the industry and the challenges in this for the FE sector
- Delivering a report on robotics and automated manufacturing
- Dissemination – across the industry and the FE sector across the UK and Europe
- Developing a range of materials that are open access to industry and FE.
- International Conferences – to drive discussion and debate across the partner countries and across Europe and as a vehicle for dissemination
- To develop a wider network of collaborators that will provide the legacy to the project

The Approach

- Wide consultation with the JLR supply chain
- Involvement of robot manufacturer Kuka to advise on content
- Consultation includes supplier involvement in developing and advising on content
- All content must be piloted through delivery to suppliers
- Requirement to develop trainers, tutors, lecturers – integral to the capacity building
- Requirement to deliver to other trainers in partner countries
- EAL bring the accreditation element to the project
- All material developed will be open access and available online
- Wide programme of dissemination

Units Under Development

1. Programmable Logic Controllers
2. Maintenance of Automation
3. Fault Finding and Recovery
4. Robot Processes and Functions
5. Automated Control Systems
6. Machine Software Design Principles
7. Robot Programming
8. Introduction to Simulation Engineering
9. Process Optimisation
10. Justifying an Automation System

Opportunities for Automotive Companies

- To contribute and shape the development of new qualifications to ensure they are directly relevant to and appropriate for industry- consultation is built into the project throughout
- To access fully funded training in the agreed units – places are available free of charge to all suppliers
- To get involved in the development of the proposed robotics trailblazer in 2017
- To access training for trainers – again FOC

Opportunities for Colleges and Training Providers

- To access the same training as suppliers, fully funded, but delivered to groups of FE professionals
- Delivery will be face to face and online via recorded/streamed classes
- Delivery can be for groups of colleges in region, dependant on demand
- Open access materials all stored on the project Moodle and can be utilised to support existing provision
- To join the dissemination network and have access to course materials and attend UK conference in 2017

Your Call to Action: contact us

- What skill needs do you have?
 - Understanding of robotics and the impact – awareness raising
 - Up-skilling of existing staff
 - Training of existing staff
- What delivery method would be most appropriate?
 - Face to face
 - Remote – streamed classes
 - Access to materials via Moodle
- Other methods of engagement: dissemination network, conference
- Client need



Contacts for further information

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