

## Liverpool John Moores University

Title: Industrial Automation Systems  
Status: Definitive  
Code: **5500MTC** (125788)  
Version Start Date: 01-08-2019

Owning School/Faculty: Maritime and Mechanical Engineering  
Teaching School/Faculty: Maritime and Mechanical Engineering

Team	Leader
Ian Jenkinson	Y

**Academic Level:** FHEQ5      **Credit Value:** 20      **Total Delivered Hours:** 46  
**Total Learning Hours:** 200      **Private Study:** 154

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Online	24
Practical	10
Tutorial	10

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Practice	AS1	Practical- laboratory based exercises	40	
Exam	AS2	Exam	60	2

### Aims

*To develop understanding of the fundamental technologies of industrial automation systems focusing on the application of PLCs, sensors and actuators to automate industrial processes and systems.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Design and implement a PLC programme on an industrial computer network to solve a manufacturing problem using IO modules, sensors and electrical actuators
- 2 Apply the principles of motor control, starters and invertors to select an electrical motor for an automated manufacturing process.
- 3 Set-up and tune a position or speed control loop (using PI and PID) and diagnose and solve problems (oscillation, offset, wind-up) with PID control loops

## Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Practical laboratory work	1	3	
Exam	1	2	3

## Outline Syllabus

*The list below provides an overview of topics which may be covered in this module:*

*Industrial PC-PLC systems, analogue and digital IO modules; Network protocols/systems for different applications (Ethernet, Field-bus, CAN-open); Design, development, and testing of PLC programmes applied to a range manufacturing applications; Interfacing PLCs with sensors and actuators. AC and DC motors; 3-phase motors, DOL, star-delta starters; Motor selection, safety and maintenance; Speed and positional control.*

## Learning Activities

Online lectures and tutorials, campus based tutorials, and campus based practical activities

## Notes

This module incorporates elements of flipped delivery in order to encourage engagement. The source of primary knowledge for this module will be via material made available through the VLE, while understanding will be developed through tutorials and significant practical content.