Liverpool John Moores University

Title: INDUSTRIAL AUTOMATION
Status: Definitive
Code: **6505ENGRIV**   (117223)
Version Start Date: 01-08-2016

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

Team	Leader
Russell English	Y
Colin Wright	

Academic Level: FHEQ6   **Credit Value:** 20   **Total Delivered Hours:** 45

Total Learning Hours: 200   **Private Study:** 155

Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	28
Seminar	10
Tutorial	4

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	Exam		70	3
Report	Rpt		15	
Report	Rpt		15	

Aims

To develop the students knowledge and understanding of industrial automation systems for manufacturing and process industries

Learning Outcomes

After completing the module the student should be able to:

1. Critically review the differences between the various types of programmable logic controllers (PLC) to choose an appropriate device for an application
2. Analyse industrial robotic control problems and design suitable solutions
3. Write a PLC program using ladder logic
4. Write a PLC program using sequential function chart
5. Understand how to integrate external devices into a PLC based industrial automation system
6. Select appropriate sensors for industrial applications

Learning Outcomes of Assessments

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

Exam   1   2   5   6

Report 1   3

Report 2   4

Outline Syllabus

Industrial robot systems and automation: robot kinematics, control, programming languages and computer aided programming systems.
Programmable Logical Controller systems. Programming with IEC 61131-3 standards – ladder diagram (LD), function block (FBD) and sequential function chart (SFC) programming. PLC input/output considerations. Designing sequential systems using a State Machine paradigm. Introduction to networks used in industrial control systems: PROFIBUS, Ethernet/PROFINET.
Integration of proximity sensors, fail safe sensors, flow, pressure, level and temperature measurement sensors, linear and rotary valve positioners, code reading sensors and RFID devices.

Learning Activities

Lectures, tutorials, laboratories, assignments, private study

Notes

On completion of the module the student should be able to design and implement automation systems for a range of industrial applications from factory automation to process control.