

Liverpool John Moores University

Title: Automation Systems
Status: Definitive
Code: **7137ENG** (120348)
Version Start Date: 01-08-2016

Owning School/Faculty: Electronics and Electrical Engineering
Teaching School/Faculty: Electronics and Electrical Engineering

Team	Leader
Clifford Mayhew	Y
Colin Wright	

Academic Level: FHEQ7 **Credit Value:** 10 **Total Delivered Hours:** 38
Total Learning Hours: 100 **Private Study:** 62

Delivery Options

Course typically offered: Runs Twice - S1 & S2

Component	Contact Hours
Lecture	24
Tutorial	12

Grading Basis: 50 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	Report	Recent Developments in Automation	30	
Exam	Exam		70	2

Aims

To have an awareness of relevant safety standards for Emergency Stop systems
To have an awareness of ATEX equipment and standards
To have an awareness of PLC Programming and Fieldbus standards
To research current developments in Automation by reviewing current papers
To use simulation techniques utilising industry standard software to analyse

throughput speeds of PLC and bus systems

Learning Outcomes

After completing the module the student should be able to:

- 1 Demonstrate a comprehensive understanding of the relevant standards for machine safety, plc programming and Fieldbus systems.
- 2 Critically analyse and evaluate the throughput speeds of PLC and bus systems using industry standard simulation techniques and software tools
- 3 Analyse scan times and biphasic effects and suggest solutions to high speed applications
- 4 Critically evaluate methods of data distribution and collection. Including HMI, SCADA, DCS, Fieldbus
- 5 Critically evaluate and review recent scholarly and industrial publications for developments in automation technology

Learning Outcomes of Assessments

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

Report	2	5		
Exam	1	3	4	5

Outline Syllabus

*Programmable Logic Controller scanning processes and throughput speeds.
Simulation of scan and selected programs in industry standard software.
High speed inputs and biphasing. Interrupts, high speed counters.
Communications and data collection options for a variety of systems. DCS, SCADA, Fieldbus systems.*

*Ex standards and operation of control equipment in explosive atmospheres.
Relevant Safety standards for emergency stop systems.
Relevant standards for PLC programming and Fieldbus implementation.
Machine Safety Directive.
Safety Integrity Levels*

Learning Activities

A series of lectures supported by tutorials including practical simulation activities.

Notes

This module is intended to give the Student a deeper understanding of the use of

specific Automation Technology, PLC systems and the implications of use in various environments.