

Liverpool John Moores University

Title: Automation and Control
Status: Definitive
Code: **6003ENGTAR** (117566)
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

Academic Level: FHEQ6 **Credit Value:** 24 **Total Delivered Hours:** 50
Total Learning Hours: 240 **Private Study:** 190

Delivery Options

Course typically offered: Summer

Component	Contact Hours
Lecture	22
Off Site	4
Practical	22
Seminar	2

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Practice	Prac		20	
Report	Rpt		50	
Report	Rpt		30	

Aims

*To gain an understanding of the design and implementation of Automation systems including the Mechanical, Electrical, Actuator Systems and Control areas
This module is designed to integrate aspects of Automation learned throughout the course. Topics contained in the module can in fact be delivered as individual*

modules where a more in-depth analysis of the individual subjects would be discussed.

Learning Outcomes

After completing the module the student should be able to:

- 1 Discuss the function in use of Fluid Power and Electro Fluid components in Actuated Systems and determine the best Actuated System for a particular application.
- 2 Use a Programmable Logic Controller and an Actuated System to solve a specific task.
- 3 Analyse the use of sensor devices used in Automated Systems.
- 4 Discuss the use of Communication Systems in an Automated System.
- 5 Analyse elements of a complete Automation System in a fully integrated system.
- 6 Understand the basics of a system incorporating Feedback and discuss PID control

Learning Outcomes of Assessments

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

Portfolio	1	2	3	4	5	6
Integrative Assignment	1	3	4	6		
Automation assignment	2	5				

Outline Syllabus

Pneumatic System and components: Symbols, Valves, Actuators etc.

Hydraulic System and components: Symbols, Valves, Actuators etc.

Automation Electrical components: Relays and Relay Control (as an introduction), PLC and PLC Control

Sensing devices used in Automation: Inductive Proximity, Capacitive Proximity, PEC

Introduction to Automation Communication Systems, how information is communicated on a Serial Bus, relevant protocols: ASi, Profibus

Control and measurement devices: Tacho Generator, LVDT, Encoders, Temperature

Measurement devices, Inverters, Proportional Fluid Power components

Feedback and control, using PI, and PID controllers

Learning Activities

50% Lecture and demonstration and 50% practical activities applying topics discussed.

Notes

This module introduces the Automated System as a holistic system that must be understood by gaining an understanding of the individual components of a system, each of which can later be researched in more detail.