

## Liverpool John Moores University

Title: Process Control  
Status: Definitive  
Code: **6115MSE** (120728)  
Version Start Date: 01-08-2018

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

Team	Leader
Barry Gomm	Y
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**Academic Level:** FHEQ6      **Credit Value:** 10      **Total Delivered Hours:** 26  
**Total Learning Hours:** 100      **Private Study:** 74

### Delivery Options

Course typically offered: Standard Year Long

Component	Contact Hours
Lecture	16
Tutorial	8

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Exam	70	2
Technology	AS1	PC Based Assignment	30	

### Aims

*To appreciate the problems associated with the design of closed-loop control of process systems. To understand the principles of cascade, feedforward and ratio control. To analyse non-linear process systems, systems containing large dead-time and coupled multi-loop systems.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the principles of cascade, feed-forward and ratio control of process plants, with typical applications
- 2 Appraise typical components in process systems and develop process models for analysis and controller design
- 3 Characterise strategies for controlling systems possessing dead-time, inverse response and interaction properties
- 4 Use computer based software packages for analysis, design and simulation of process control systems

## Learning Outcomes of Assessments

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

Examination	1	2	3
PC based assignment	1	4	

## Outline Syllabus

*Actuator and sensor dynamics for processes, dynamics of time delay, stability of systems involving time delays, frequency response stability criteria, fitting first and second order models using step tests.*

*Transfer function modelling using linearisation and deviation variables, digital PID control, cascade, ratio, feed-forward + feedback control, internal model control, Smith predictor, multivariable control systems.*

## Learning Activities

Lectures and tutorials

## Notes

This Level 6 module describes the analysis and design principles of closed-loop control of process systems.