

## Liverpool John Moores University

Title: Process Control  
Status: Definitive  
Code: **6312ELE** (121436)  
Version Start Date: 01-08-2021

Owning School/Faculty: Engineering  
Teaching School/Faculty: Engineering

Team	Leader
Barry Gomm	Y
Dingli Yu	

**Academic Level:** FHEQ6      **Credit Value:** 20      **Total Delivered Hours:** 57  
**Total Learning Hours:** 200      **Private Study:** 143

### Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	44
Tutorial	11

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Exam	70	2
Technology	AS1	Design 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
Design Assignment	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, tutorials and design based laboratory activities.

## Notes

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