

## Liverpool John Moores University

Title: INSTRUMENTATION AND CONTROL SYSTEMS  
Status: Definitive  
Code: **4504ICBTME** (127031)  
Version Start Date: 01-08-2021  
  
Owning School/Faculty: Engineering  
Teaching School/Faculty: ICBT, Colombo

Team	Leader
Alison Cotgrave	Y

**Academic Level:** FHEQ4      **Credit Value:** 15      **Total Delivered Hours:** 71  
**Total Learning Hours:** 150      **Private Study:** 79

### Delivery Options

Course typically offered: S2 and Non Std S2 (S2 for Jan)

Component	Contact Hours
Lecture	45
Practical	9
Tutorial	15

**Grading Basis:** 40 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Coursework 1500 Words	30	
Exam	AS2	Exam	70	2

### Aims

*This unit introduces the students to control systems and industrial automation. This unit will aim to provide understanding of a range of control systems that are used in industrial and domestic environments and enable them to produce specifications for mechatronic products thereby obtaining the ability to design and implement simple automated systems in industrial context.*

## Learning Outcomes

After completing the module the student should be able to:

- 1 Identify the instrumentation systems and regulating units.
- 2 Demonstrate an understanding of the process control concepts, systems and controllers.
- 3 Solve problems related to block diagrams, system mathematical modelling, time response, PID, S plane.
- 4 Demonstrate the knowledge of application for control systems using software simulation.

## Learning Outcomes of Assessments

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

Coursework	2	4
Exam	1	3

## Outline Syllabus

*Introduction to control systems and automation*

*Actuators and sensors in control systems*

*Open loop and closed loop (feedback) systems*

*Solutions in Laplace domain and time domain*

*First and second order systems*

*State space and Feedback loop architecture*

*Transient response*

*Limitations on performance of control systems*

## Learning Activities

Students will be supported in their learning, to achieve the above learning outcomes, in the following ways:

By a series of lectures and tutorials and through participation within laboratory practical sessions for problem solving.

Self-managed investigative study to analyse cases related to selection of materials and failure of materials

In-class participation and case studies are key features of this module.

A recommended resource list - indicating key reading, internet support and physical learning assistance, is provided to help enable students to undertake self-directed study.

## **Notes**

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