

Module Title Control and Instrumentation Keywords Control systems, System response, Stability, State space methods, Instrumentation, Measurement	Reference	EN4501
	SCQF	SCQF
	Level	10
	SCQF Points	15
	ECTS Points	7.5
	Created	December 2003
	Approved	March 2004
	Amended	August 2011
	Version No.	3

This Version is No Longer Current

The latest version of this module is available [here](#)

Prerequisites for Module

Signal Acquisition,
Instrumentation and Control
(EN3500)

Corequisite Modules

None.

Precluded Modules

Control and Signal Processing
(EN4502)

Aims of Module

To provide the student with the ability to analyse and design control and instrumentation systems.

Learning Outcomes for

Indicative Student Workload

	Full Time	Part Time
<i>Contact Hours</i>		
Laboratory	6	6
Lecture	24	24
Tutorials	24	24

Directed Study

Directed Study	24	24
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Private Study

Private Study	72	72
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Mode of Delivery

This is a lecture based course supported by tutorial sessions, laboratory work and directed study.

Assessment Plan

Learning Outcomes Assessed

Module

On completion of this module, students are expected to be able to:

1. Analyse the performance of control systems.
2. Analyse and design control systems using appropriate analytical methods such as those employing frequency response and state space.
3. Assess the performance of a range of common measurement systems.
4. Produce measurement system designs which meet a given specification.

Indicative Module Content

Systems modelling, transfer functions, transient and steady state response methods, frequency response methods, stability analysis, state space representation and signal flow graphs. Instrumentation system characteristics including their application and response in noisy electrical environments. The application of specialised measurement systems with examples from process plant eg flow, pressure, temperature and/or level. Some areas of applied measurement: intrinsically safe systems, EMC, PLCs and/or Fieldbus.

Component 1	2,3,4
Component 2	1,2,3,4

Component 2 is a closed book examination of 2.5 hours (70% weighting).

Component 1 is coursework typically based on relevant control and measurement systems and will be assessed by a written report, class tests or otherwise (30% weighting).

Indicative Bibliography

1. BENTLEY, J.P., 2005. Principles of Measurement Systems. 4th ed. Prentice Hall.
2. BIRAN, A. and BREINER, M., 2002. MATLAB 6 for Engineers. Prentice Hall.
3. DORF, R.C. and BISHOP, R.H., 2017. Modern Control Systems. 13th ed. Pearson.
4. DUTTON, K., THOMPSON, S. and BARRACLOUGH, B., 1997. The Art of Control Engineering. Harlow: Pearson.
5. HAHN, B. and VALENTINE, D., 2015. Essential MATLAB for Engineers and scientists. 5th ed. Butterworth-Heinemann.

