

MODULE DESCRIPTOR

Module Title

Control and Instrumentation

Reference	EN4501	Version	8
Created	April 2023	SCQF Level	SCQF 10
Approved	March 2004	SCQF Points	15
Amended	August 2023	ECTS Points	7.5

Aims of Module

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

Learning Outcomes for Module

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

- 1 Evaluate instrumentation and measurement principles to the solution of complex problems with awareness of wider context of engineering.
- 2 Employ linear control and computational techniques to model complex problems, discussing the limitations of the techniques employed.
- 3 Apply comprehensive knowledge of mathematics and control engineering principles to the solution of complex problems.

Indicative Module Content

Control: Transient and steady state responses, Stability and Routh-Hurwitz criterion, Root Locus, Frequency responses and Bode plots, Lead-Lag compensators design, State-space models. Instrumentation: Instrumentation system characteristics including their applications and response in noisy electrical environments, Electrical sensors, Flow meters, Intrinsically safe systems and professional codes of conduct.

Module Delivery

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

Indicative Student Workload

	Full Time	Part Time
Contact Hours	50	50
Non-Contact Hours	100	100
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type: Coursework Weighting: 100% Outcomes Assessed: 1, 2, 3

Description: A portfolio of evidence of applying principles, analysing, modelling complex problems, designing and evaluating control and instrumentation techniques and systems.

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

Component 1 comprises 100% of module grade. To pass the module, a D grade is required.

Module Grade	Minimum Requirements to achieve Module Grade:
A	A
B	B
C	C
D	D
E	E
F	F
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	Signal Acquisition, Instrumentation and Control (EN3500)
Corequisites for module	None.
Precluded Modules	None.

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.