MODULE DESCRIPTOR

Module Title

Control and Instrumentation

Reference	EN4501	Version	5
Created	January 2017	SCQF Level	SCQF 10
Approved	March 2004	SCQF Points	15
Amended	June 2017	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	Apply classical control techniques in the analysis and design of linear, continuous-time control systems.
2	Analyse, design and evaluate the performance of controllers using computer simulation tools.
3	Demonstrate knowledge of and apply the principles underpinning specialist measurement systems.
4	Analyse, evaluate and modify measurement system designs such that the systems 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.

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
Actual Placement hours for professional, statutory or regulatory body		

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ASSESSMENT PLAN

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

Component 1

Type:	Coursework	Weighting:	30%	Outcomes Assessed:	2, 3
Description:	A two part coursework consisting of: the control component, focussing on controller performance and design using Computer Aided Design tools and the instrumentation component emphasising the underpinning knowledge and processes used in instrumentation analysis and design.				

Component 2

Type:	Examination	Weighting:	70%	Outcomes Assessed:	1, 4
Description:	An examination.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

In order to pass, students should achieve a mark of at least 35% in each component (which has a weighting of 30% or more) and an overall grade D or better.

Module Grade	Minimum Requirements to achieve Module Grade:
A	>=70
B	60-69
C	50-59
D	40-49
E	35-39
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	Control and Signal Processing (EN4502)

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.