

MODULE CODE: ACDA4005
TITLE: Principles of Systems Engineering
DATED: 15/08/2018

LEVEL: 4
CREDITS: 20

JACS CODE: H610

AIM(S)

- To provide the students with a comprehensive and systematic understanding of the concepts underlying systems engineering.
- To provide the students with a holistic and interdisciplinary approach as a means of enabling the realisation of systems engineering in a test and evaluation environment.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- Demonstrate an understanding of the holistic role of systems engineering, including needs analysis, developing options, assessing risk and constraints.
- Communicate their knowledge and skills in applying systems engineering tools and techniques to requirements engineering and system design.
- Apply the principles and tools to a realistic case study, demonstrating a greater understanding of systems concepts and thinking.

INDICATIVE CONTENT

- Systems and the Structure of Complex Systems.
- Systems Development Processes, including purpose, context and interaction.
- Engineering Design Methods and Tools (including Venn diagrams).
- Requirements Capture and Analysis.
- Functions and Functionality.
- Concept Design, including the relationship of System, Subsystem and component.
- Integration and Evaluation, Validation and Verification.
- Robust Design
- Systems Engineering Management.

LEARNING AND TEACHING STRATEGY

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	60	30%
Independent learning	140	70%
Placement learning	0	0%
TOTAL	200	100%

ASSESSMENT

Assessment Component 1

☐ Written exam ☒ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written report	The assignment will consist of a practical-based report on the design of a typical munition or related device, applying the principles of systems engineering (2,000 words)	50%

Assessment Component 2

☒ Written exam ☐ Coursework ☐ Practical

Mode of assessment	Volume	Weighting
Written Exam	2 hours	50%

Assessment Summary

Activity type	Percentage
Written exam	50%
Coursework	50%
Practical	0%
TOTAL	100%

READING LIST

Module Code	ACDA4005	
Module Title	Principles of Systems Engineering	
Classification	Reading List entry	Electronic*
Essential	Kossiakoff, A., Sweet, W., Seymour, S., Biemer, S. <i>Systems Engineering Principles and Practice</i> , Wiley-Blackwell (2011).	☒
Further	Blanchard, B. <i>Systems Engineering Management 4th Edition</i> , Wiley (2009)	☐
Further	Kasser, J. <i>Holistic Thinking: Creating innovative solutions to complex problems</i> , CreateSpace Independent Publish Platform (2013)	☐
Further	<i>ACM Transactions on Information Systems</i>	☒
Further	<i>Journal of Data and Information Quality</i>	☒
Further	<i>Journal of the ACM</i>	☒
Further	<i>Journal of Systems Engineering and Electronics</i>	☒