WM950-15 Systems Thinking and Systems Engineering

24/25

Department
WMG
Level
Taught Postgraduate Level
Module leader
David Wright
Credit value
15
Module duration
4 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

This module provides an overview of systems thinking and Systems Engineering approaches required to help understand and design complex engineered systems.

Module aims

To establish key principles and methods of systems thinking to help students address complex problems and consider the needs of Enterprises. This will include identifying stakeholders, capturing and managing requirements and translating these into appropriate solutions. Students will be given an appreciation of whole lifecycle views and approaches and selected Systems Engineering management processes essential to deliver successful, complex programmes.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Systems thinking and Systems Engineering concepts
- Prioritising goals, stakeholders and requirements
- Designing solutions to meet stakeholder requirements
- System lifecycle and system development lifecycles approaches
- Systems Engineering modelling approaches

Learning outcomes

By the end of the module, students should be able to:

- Critically evaluate the role of systems thinking and Systems Engineering methodology when used to design complex, multi-stakeholder systems
- Explain how Systems Engineering can support the prioritisation of a programme's goals and stakeholders
- Plan effective development, delivery, in-service support and retirement for products and systems using the principles of Systems Engineering
- Evaluate Systems Engineering development processes individually and as part of a group, including requirements management, verification, validation and integration.

Indicative reading list

View reading list on Talis Aspire

Subject specific skills

Systems Thinking, Systems Development Lifecycle Models, Systems Engineering processes, tools and techniques, Requirements Elicitation

Transferable skills

Systems Thinking, Communications, Leadership, Organisation, Teamwork, Team Development, Problem Solving.

Some of the skills developed during this module form part of Warwick University's 12 Core Skills (see https://warwick.ac.uk/services/skills/warwickaward/coreskills/).

Study

Study time

Type	Required
Lectures	20 sessions of 1 hour (13%)
Total	150 hours

Type	Required
Seminars	10 sessions of 1 hour (7%)
Online learning (independent)	60 sessions of 1 hour (40%)
Assessment	60 hours (40%)
Total	150 hours

Private study description

No private study requirements defined for this module.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A3

	Weighting	Study time	Eligible for self-certification
Assessment component			
Written assessment	60%	40 hours	Yes (extension)
A written assessment in which a Systems Engineering analysis is conducted for an suitable example system using a range of applicable methods introduced during the module.			
Reassessment component is the same			
Assessment component			
Self guided learning assessment	20%	12 hours	No
A self-assessment test launched at the beginning of the module which is designed to test the student's grasp of the key principles of Systems Engineering acquired from recommended reading resources and classroom-based learning. This test is normally facilitated via the University VLE (Moodle).			

	Weighting	Study time	Eligible for self-certification
Reassessment component			
Self guided learning assessment (resit)			No

A self-assessment resit test designed to test the student's grasp of the key principles of Systems Engineering acquired from recommended reading resources and classroom-based learning. This test is normally facilitated via the University VLE (Moodle) and is designed to test the same knowledge and skills as the in-class self guided learning assessment but can be completed outside the classroom.

Assessment component			
Group Presentation	20%	8 hours	No

Tutor-directed and self-guided activities conducted in groups and culminating in a group presentation. The topic of this presentation will be based on certain aspects of the work done during the taught week of the module. The mark awarded to each member of the group will be informed by a peer adjustment marking process.

Reassessment component			
Individual Presentation			Yes (extension)

This resit presentation will be given by the individual student via video in live or pre-recorded form. It will revise and enhance their contribution to the group's original presentation in line with feedback given by the marker(s).

Feedback on assessment

Written feedback on the essay, of approximately 300 - 400 words, will be provided 4 weeks after the date of submission. The feedback will be focussed on the strengths and weaknesses of the work with regards to the module learning objectives and the assessment's marking guidelines. Suggestions for improvement will also be provided.
Feedback on the group presentation will be given verbally during the module and supplemented with written comments provided separately.

Availability

There is currently no information about the courses for which this module is core or optional.