



MODULE SPECIFICATION

Part 1: Information			
Module Title	Foundations of Systems Engineering		
Module Code	UFMFNB-15-M	Level	Level 7
For implementation from	2018-19		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	Engineering, Design and Mathematics
Department	FET Dept of Engin Design & Mathematics		
Contributes towards	Engineering Competence [Jan][PT][FR][2yrs] PGDip 2018-19 Professional Engineering [Sep][FT][Frenchay][1yr] MSc 2018-19		
Module type:	Project		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description
<p>Overview: This is the introductory module in a suite of systems engineering modules which include in-depth modules on requirements engineering and project management.</p> <p>Educational Aims: See Learning Outcomes.</p> <p>Outline Syllabus: Issues and problems in current engineering practice: Successes and failures in large engineering projects; cost and timescale overrun and quality shortfall; team structures; communities of practice in engineering; scope and use of development and management methodologies.</p> <p>Organisational context: engineering socio-technical systems; strategies for process improvement; the role of standard process models; human factors in the adoption of new techniques;</p>

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organisational models and architectures; managing change.

Holistic systems engineering: scope of systems from engineering artefacts to human activity systems and complex socio-technical domains; systems thinking principles; lifecycle from problem formulation through design and manufacturing to maintenance and disposal; problem domain analysis; soft systems methods; systems dynamics.

Systematic systems engineering: user requirements elicitation; requirements validation and verification, derived and system requirements; system modelling and system modelling languages; model-driven development; risk analysis; validation and verification tools; configuration management; system integration; modelling and engineering organisational work structures and flows.

Teaching and Learning Methods: Scheduled learning

A typical schedule would be five days of lectures / tutorials / workshops, split 3 and 2, with a reflective period out of academia in between. The theory will be immediately applied and assessed in a project assignment, based in the student's own organisation. Teaching will use a mixture of lecture, invited industrial speaker, discussion groups and student presentations. The format may be modified as appropriate to the learners' needs.

Independent learning

There will be pre-work to familiarise students with the concepts to be taught. The post module assignment will require further independent learning within the workplace.

Part 3: Assessment

As a short, intensive module, the single component and element in the assessment will be a project assignment to be submitted after approximately 8 weeks. The assignment will require demonstration of independent learning of theory and critical reflection of the student's work both in the classroom and during the assignment period outside the classroom. A mix of general and individual written feedback will be provided. The word-length of the assessment is not relevant as the its content will be judged on quality of content and conciseness of expression in order to maximise communication effectiveness and avoid reproduction of taught material, but will normally be expected to be around 3000 to 5000 words.

First Sit Components	Final Assessment	Element weighting	Description
Final Project - Component A	✓	100 %	The assignment will require demonstration of independent learning of theory and critical reflection of the student's work both in the classroom and during the assignment period outside the classroom. A mix of general and individual written feedback will be provided.
Resit Components	Final Assessment	Element weighting	Description
Final Project - Component A	✓	100 %	The assignment will require demonstration of independent learning of theory and critical reflection of the student's work both in the classroom and during the assignment period outside the classroom. A mix of general and individual written feedback will be provided.

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Part 4: Teaching and Learning Methods		
Learning Outcomes	On successful completion of this module students will be able to:	
	Module Learning Outcomes	
	MO1	Understand issues and problems in current engineering practice
	MO2	Build a detailed knowledge of the holistic approach to systems engineering
	MO3	Understand the issues surrounding the embedding of systems engineering in an organisation
	MO4	Demonstrate the ability to audit current engineering practice
	MO5	Identify and implement areas for the application of systems engineering, and select the required methods and tools of systems engineering
	MO6	Demonstrate skills to analyse and critique engineering practices
	MO7	Show understanding of and the ability to implement the processes and practices of systematic systems engineering
	MO8	Be able to scope and represent a problem domain within a wider context
Contact Hours	Contact Hours	
	Independent Study Hours:	
	Independent study/self-guided study	115
	Total Independent Study Hours:	115
	Scheduled Learning and Teaching Hours:	
	Face-to-face learning	35
	Total Scheduled Learning and Teaching Hours:	35
	Hours to be allocated	150
	Allocated Hours	150
Reading List	<p>The reading list for this module can be accessed via the following link:</p> <p>https://uwe.rl.talis.com/modules/UFMFNB-15-M.html</p>	