Module Specification

Navigating Engineering Project Complexities

Version: 2025-26, v1.0, Approved

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Part 1: Information

Module title: Navigating Engineering Project Complexities

Module code: UFMEBF-45-M

Level: Level 7

For implementation from: 2025-26

UWE credit rating: 45

ECTS credit rating: 22.5

College: College of Arts, Technology and Environment

School: CATE School of Engineering

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This optional module is for students who wish to specialise in the management of engineering-focused projects. It emphasises systems thinking, complexity theory, and various skills necessary for leading large complex engineering projects, such as those involving the design of infrastructure, aerospace and industrial systems.

Features: This module is aligned with the Association for Project Management (APM) Competence Framework and the Project Management Institute (PMI) Global Accreditation Centre (GAC) standards.

Educational aims: The educational aims of this module are to:
Develop a deep understanding of how project management supports strategic change in engineering settings.
Equip students with the financial and commercial acumen required to manage budgets, contracts, and business cases.
Foster systems thinking in the design and delivery of large engineering projects.
Prepare students for leadership roles in dynamic and complex industries.

Outline syllabus: Indicative content
The syllabus may include (but is not limited to):

Systems thinking and complexity theory
Aspects of complexity in engineering projects settings
Project complexity assessment tools and models
Digital transformation and agile engineering practices
Procurement and contract management of large complex engineering projects
Stakeholder engagement and communication strategies
Financial and Commercial Project Management
Business case development and investment appraisal (NPV, IRR, Payback)
Budgeting, forecasting, and cost control
Financial reporting and performance metrics
Innovation in Engineering Projects
Start-up project planning and lean methodologies
Governance and compliance in large scale engineering projects

Part 3: Teaching and learning methods

Teaching and learning methods: The teaching and learning strategy is based on enquiry-based learning (EBL), which is an umbrella term for learning that arises through a structured and supported process of enquiry and is designed to foster

deep learning and learner independence through active (and usually collaborative) engagement with relevant and meaningful problems and issues. EBL is based on the premise that learning becomes more effective when students are actively involved in the learning process.

Learning sessions will be based on case studies, and practical skills sessions providing students with realistic project scenarios and challenging them to make decisions relating to strategic business projects.

Students learn in 3 steps: Prepare, Participate, and Practise. First, ahead of the classes, students prepare by studying the provided and suggested materials to acquire background knowledge. Second, students actively participate in class via group debates, completion of tasks and interactive sessions, becoming co-creators of their own learning journey. Third, students practise by applying what they have learnt to real-world problems.

The inclusion of groupwork will provide students with experience of teamworking, managing roles, relationships and differing perspectives in the achievement of a specific task. Groupwork will be supported by learning sessions on the principles and techniques of team working, as well as a regulatory framework that will encourage active participation on the part of all members.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Critically analyse and evaluate the characteristics and challenges of complex engineering project environments.

MO2 Critically evaluate and apply appropriate project management methodologies to manage complexity effectively.

MO3 Develop adaptive risk management and decision-making strategies in complex engineering environments.

MO4 Design and propose innovation-focused solutions to project complexities using recognised professional approaches and frameworks suited to engineering contexts.

Hours to be allocated: 450

Contact hours:

Independent study/self-guided study = 342 hours

Face-to-face learning = 108 hours

Reading list: The reading list for this module can be accessed at readinglists.uwe.ac.uk via the following link https://uwe.rl.talis.com/index.html

Part 4: Assessment

Assessment strategy: 1: Group Project presentation (40%) - (25 minutes)
Based on a provided case study, students will work in teams to design and propose a suitable innovation solution to project complexities using recognised professional approaches and frameworks suited to Engineering contexts.
Peer-assessment will be considered as part of the assessment process.
Groupwork will be supported not only by teaching inputs, but also by a set of protocols that will encourage a sense of shared responsibility for the group's outputs. These protocols will empower groups to address issues of poor engagement by individual members. These include:
A group contract
Guidance on record keeping for group activities in line with project management principles (stakeholder communication and engagement, monitoring documentation, etc.)
A procedure for addressing poor engagement of individual group members
The facility to award different marks in line with the grade boundaries to different group members in the final assessment to reflect individual inputs more accurately.
The module assessment provides for marks for content and structure to be varied between students according to individual contributions, subject to the provision of specified evidence.

Resit assessment will be the same as the first-sit where possible.
Where group work is not possible, the resit will be an individual Recorded

PowerPoint presentation (15 minutes)

2: Case Study Analysis (60%)
Type: Individual coursework (3500 words)
Based on the same provided case study, students will critically analyse and evaluate the characteristics and challenges of complex engineering project environments.
Critically evaluate and apply appropriate project management methodologies to manage complexity effectively. and
Develop and suggest suitable risk management and decision-making strategies in complex environments.

Resit assessment will match the first sit.

Assessment tasks:

Presentation (First Sit)
Description: Group Project presentation (40%) - 25 minutes
Weighting: 40 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO1, MO4

Case Study (First Sit)
Description: Individual Case Study Analysis (60%) (3500 words)
Weighting: 60 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO2, MO3

Presentation (Resit)
Description: Group presentation (25 minutes) or equivalent.
Weighting: 40 %
Final assessment: No
Group work: No

Learning outcomes tested: MO1, MO4

Case Study (Resit)
Description: Individual Case Study Analysis (60%) (3500 words)
Weighting: 60 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO2, MO3

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Project Management [Frenchay] MSc 2025-26