Module Specification

Sustainable Infrastructure Projects & Design

Version: 2026-27, v1.0, Approved

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Part 1: Information

Module title: Sustainable Infrastructure Projects & Design

Module code: UFMECB-30-M

Level: Level 7

For implementation from: 2026-27

UWE credit rating: 30

ECTS credit rating: 15

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 module develops advanced knowledge and professional skills required to design, evaluate, and manage sustainable infrastructure projects. Students will explore sustainable design approaches, life cycle thinking, infrastructure resilience, and systems integration. The module integrates engineering design, sustainability assessment strategies, and management of engineering projects to enable students to develop sustainable infrastructure solutions for complex and real-world challenges.

Features: Not applicable

Educational aims: This module aims to develops students' ability to critically design and deliver sustainable infrastructure projects by integrating environmental, social, economic, and governance considerations. It emphasises systems thinking, lifecycle analysis, and ethical decision-making to address complex, policy-driven challenges, and promote innovative, resilient, and future-oriented infrastructure solutions.

Outline syllabus: The syllabus for this module includes sustainability in principled and in infrastructure design, life cycle assessment and environmental impacts, and sustainable urban infrastructure systems. The module also considers climate change and infrastructure resilience, smart technologies in infrastructure design, sustainable transport and energy infrastructure, and infrastructure project planning and circularity. Infrastructure policy, governance and finance, and integrated approaches for sustainable infrastructure design project are also critically considered in the module delivery.

Part 3: Teaching and learning methods

Teaching and learning methods: This module considers a robust teaching and learning strategy moving beyond conventional delivery toward an integrative, practice-oriented and critically reflective model that mirrors real-world infrastructure complexity. The module adopts a blended of problem-based and experiential learning framework, grounded in enhancing student learning experience. This enables students to engage with authentic infrastructure challenges where sustainability is contested, uncertain, and context dependent. This strategy will prepare students to navigate uncertainty, conflicting stakeholder interests, sustainability and design challenges, and evolving policy landscapes for infrastructure projects.

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

MO1 Analyse sustainability challenges in infrastructure systems and evaluate design strategies that incorporate environmental, social, and economic considerations.

MO2 Apply sustainable design principles and tools (e.g., LCA, environmental impact assessment) to real-world infrastructure projects.

MO3 Critically assess infrastructure development strategies in relation to environmental governance, policy, and sustainability goals.

MO4 Produce professional design reports and technical presentations and demonstrate advanced management skills for sustainable infrastructure delivery.

Hours to be allocated: 300

Contact hours:

Independent study/self-guided study = 228 hours

Staff-guided learning = 72 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: The module adopted a programme-integrated assessment framework, to ensure that the assessments reflect real-world infrastructure practice while directly mapping to the module intended learning outcomes. The assessment approach adopted for this module include:
1.Assessment - Sustainable infrastructure design project report. This is 2500-word report. Formative feedback will be provided prior final submission for summative assessment and feedback.
2.Assessment - Group project presentation on integrating sustainability into design of smart infrastructures. This is a 20 minutes group presentation session and 10 minutes Q/A session.
This assessment is designed to require iterative explanation and justification of design decisions, ensuring original authorship and minimising plagiarism.

Assessment tasks:

Written Assignment (First Sit)
Description: Sustainable infrastructure design project report (2500 words excluding references) .
Weighting: 70 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO4

Presentation (First Sit)
Description: Assessment - Group project presentation on integrating sustainability into design of smart infrastructures. The presentation is for 20 minutes while Q/A session is for 10 minutes.
Weighting: 30 %
Final assessment: No
Group work: Yes
Learning outcomes tested: MO3, MO4

Written Assignment (Resit)
Description: Sustainable infrastructure design project report (2500 words excluding references) .
Weighting: 70 %
Final assessment: Yes
Group work: No
Learning outcomes tested: MO1, MO2, MO4

Presentation (Resit)
Description: Assessment B - Group project presentation on integrating sustainability into design of smart infrastructures. The presentation is for 20 minutes while Q/A session is for 10 minutes.
Weighting: 30 %
Final assessment: No
Group work: Yes

Learning outcomes tested: MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Sustainable Technology [Frenchay] MSc 2026-27