



MODULE SPECIFICATION

Part 1: Information			
Module Title	Digital Engineering for Infrastructure		
Module Code	UBGMHW-15-M	Level	Level 7
For implementation from	2019-20		
UWE Credit Rating	15	ECTS Credit Rating	7.5
Faculty	Faculty of Environment & Technology	Field	
Department	FET Dept of Geography & Environmental Mgmt		
Contributes towards			
Module type:	Standard		
Pre-requisites	None		
Excluded Combinations	None		
Co- requisites	None		
Module Entry requirements	None		

Part 2: Description	
1	<p>Educational Aims: This module aims to develop a long-term strategy in implementing DE for infrastructure across various projects and the asset life cycle. The module will evaluate project case studies that demonstrate how DE is driving innovation, transforming business processes and achieving infrastructural project outcomes. Students will be able to demonstrate their ability to implement innovation and transformation using practice-based projects.</p> <p>Outline Syllabus: The module aims to develop student's expertise and knowledge in bringing together digital engineering tools and techniques such as BIM, data analytics, and the internet of things. The module allies traditional infrastructure designs and computational methods with new technologies that have the potential to deliver unprecedented efficiencies across the civil engineering sector and the built environment. Students will analyse and critically evaluate the potential of digital engineering systems to improve the design, delivery, management and use of</p>

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infrastructure. The module aims to engage and educate engineers in practical ways of optimising and leading the way infrastructure and buildings are managed, leading to direct and indirect economic, sustainable, social and environmental benefits.

Indicative content

- Infrastructure and Building capability with BIM
- Geographical Information Systems (GIS)
- Gaining Insight with Sensors
- Data Analytics and Grappling with big data
- Intelligent construction machines
- Computer Modelling of Civil Engineering Problems
- Asset Information Management (AIM)
- Internet of Things

Teaching and Learning Methods: The module will be delivered through lectures, case studies, practical sessions, modelling techniques with software tools and field visits.

Infrastructure projects from around the world will be used as case studies and guest speakers will be invited from industry.

Hands-on experience in inspection, testing and monitoring will be gained through field visits. The coursework will be done by group work but with individual submission.

Part 3: Assessment

The learning outcomes are assessed using information and test data gathered in lectures to analyse and develop solutions to complex engineering problems. Summative assessment will comprise:

Component A: Poster presentation (Controlled Conditions)

Students will be required to work in groups to identify and evaluate infrastructure projects from around the world and propose appropriate methods of application of digital engineering using data analytics. They are required to critically evaluate the process, and to justify their conclusions and recommendations. They will showcase this through the creation of a group poster and a 20 minute group presentation. GEM group work policy will be used to appropriately reflect individual student effort in this process. (Learning outcomes 3)

Component B: Portfolio

Students will be required to submit an individual reflective portfolio demonstrating the practice and application of design choices and the strategies / operational processes required to achieve required project outcomes. As a reflective exercise, it requires detailed understanding and demonstrative ability in the topics discussed. (Learning outcomes 1, 2, 4).

Formative feedback will be given during tutorial sessions.

Re-sit Strategy:

Component A: As above, noting that the student will have to provide an individual presentation based on the group work in which s/he was engaged.

Component B: As above.

First Sit Components	Final Assessment	Element weighting	Description
Poster - Component A	✓	30 %	This is a poster presentation. Students will be required to identify and evaluate infrastructure projects from around the world and propose appropriate methods of application of digital engineering using data analytics. They are required to critically evaluate the process, and to justify their conclusions and recommendations. (20 mins)

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Portfolio - Component B		70 %	Students will be required to submit an individual reflective portfolio demonstrating the practice and application of design choices and the strategies / operational processes required to achieve required project outcomes. As a reflective exercise, it requires detailed understanding and demonstrative ability in the topics discussed. (2,000 words max)
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Part 4: Teaching and Learning Methods																			
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Reading List	<i>The reading list for this module can be accessed via the following link:</i>																		

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