UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Digital Twins and Simulation
Module Code	OIM7516-A
Academic Year	2024/5
Credits	10
School	School of Management
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	11
Online Lecture (Asynchronous)	11
Seminars	10
Laboratories	12

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims

This module aims to establish a foundational understanding of digital twin and simulation modelling. It aims to cultivate awareness, knowledge, and proficiency in exploring digital twin technologies to develop solutions. Participants will gain confidence in applying various Business Project Simulation and Modelling methodologies across diverse business environments, alongside an introduction to prescriptive analytics. Emphasis will be placed on the pivotal role of Digital Twin and Simulation prescriptive analytics within analytics and logistics domains. Participants will explore the fundamental components of digital twins and business simulation. Module is tailored for current and aspiring leaders influencing decision-making processes, offering insights to facilitate digital transformation and organisational advancement.

Outline Syllabus

* Introduction to systems modelling and applications
* Exploring dynamic model components and conceptual system modelling
* Types of Simulation approaches and technologies
* Introduction to digital twins
* Harnessing AI, AR, and VR for digital twin development and deployment
* Utilising digital twins as solutions for efficiency enhancement and productivity boost
* Explore socio-technical skills required for constructing integrated digital twins
* Comparing Digital Twins and Simulations
* Case studies illustrating real-world applications

Learning Outcomes

Outcome Number	Description
01	Show rigorous understanding of the main concepts of systems and system modelling.
02	Show rigorous understanding of the main concepts of digital twins.
03	Critically compare and evaluate relevant digital twins and simulation methods to improve business productivity.
04	Demonstrate adaptability and originality in designing and implementing digital twins and simulation models and explain their results.
05	Demonstrate adaptability and originality in tackling and solving problems, and the ability to work cooperatively with others.

Learning, Teaching and Assessment Strategy

The teaching strategy encourages critical understanding of the role played by simulation for business decision making. Learning will be directed, supported, and reinforced through a combination of lectures, seminars, computer laboratory sessions, and online discussion groups, plus directed and self-directed studies. The course may include research-led elements and offers a mix of theoretical insights and case study material that will be delivered both online and offline where appropriate.

The assessment strategy is designed to provide students with the opportunity to demonstrate that they appreciate methods that underpin Digital Twins and Simulation and their uses to gain business insights. Assessment for this module consists of (formative) weekly quizzes and a final (Summative) case study coursework 100%.

Feedback: Students will be given the opportunity to receive formative assessment and feedback relevant to the weekly sessions. Some quizzes based assessment relevant to the coursework may be provided on Canvas discussion forums. You are encouraged to seek further feedback during the lab sessions or during feedback consultation hours.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Coursework - Written	Final coursework reviewing applications of one or more the techniques in real life.	100%
Formative	Not assessed	Weekly sessions based quizzes.	N/A

Reading List
To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:
This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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