

Module Code	ACMA5018
Title	Modelling and Simulation
Date	26/05/2023
Level	5
Credits	10
Pre-Requisites	None

AIM(S)

- To critically evaluate modelling and simulation techniques and solutions for logistics operations and supply chains.

LEARNING OUTCOMES

Upon the successful completion of this module, the student should be able to:

- understand the role which digital modelling and simulation has within a process improvement framework;
- evaluate modelling solutions (i.e. Value Stream Mapping) to improve the performance of a logistics system and to make recommendations for future development and implementation.

INDICATIVE CONTENT

- Digital modelling and simulation overview. Different classification of modelling – off-line programming, discrete event simulation, virtual commissioning
- Process Flow Mapping and Value Stream Mapping – extracting maximum benefit prior to development of digital models
- Defining characteristics – digital models vs. digital shadows vs. digital twins
- Understanding the desired simulation outputs and determining data collection requirements. Automated data logging and data collection technologies
- Statistical analysis techniques for distribution
- Practical modelling exercises – batch production, continuous flow, pull and push systems, Kanban
- Verification and validation of models
- Analysis of simulation data and development of improvement plans

Study Time Allocation

The study time for the module is divided as follows:

Activity type	Hours	Percentage
Scheduled learning	24	24%
Independent learning	76	76%
Placement learning	0	0
TOTAL	100	100%

ASSESSMENT

Assessment Component 1

(Tick one)

☐ Written exam ☐ Coursework ☒ Practical

Mode of assessment	Volume	Weighting
Modelling Exercise explained in a modelling report	2,000 words	100%

Assessment Summary

Activity type	Percentage
Written exam	0
Coursework	0%
Practical	100%
TOTAL	100%

INDICATIVE READING LIST

Module Code	ACMA5018	
Module Title	Modelling and Simulation	
Classification	Reading List entry	Electronic*
Essential	Shapiro, J. F. (2007) <i>Modelling the Supply Chain</i> Cincinnati: Thomson Brooks/Cole	☐
Essential	Tipi, N. (2021) <i>Supply Chain Analytics and Modelling: Quantitative Tools and Applications</i> London: Kogan Page	☐
Essential	Banks, J. et al (2013) <i>Discrete Event System Simulation</i> 5 th Ed, Harlow: Pearson	☐
Further	Robinson, S., Kotiadis, K., Brooks, R. J. and van der Zee, D. J. (2011) <i>Conceptual Modeling for Discrete-Event Simulation</i> London: CRC Press	☐
Further	Ebrahimi, M. (ed) (2018) <i>Modeling and Simulation Techniques for Improved Business Processes</i> Hershey PA: IGI Global https://doi-org.ezproxy.uwtsd.ac.uk/10.4018/978-1-5225-3226-2	☒