

INTR8028: BIM - Theory and Practice

Module Details	
Module Code:	INTR8028
Title:	BIM - Theory and Practice APPROVED
Long Title:	BIM - Theory and Practice
NFQ Level:	Advanced
Valid From:	Semester 1 - 2022/23 (September 2022)
Duration:	1 Semester
Credits:	5
Field of Study:	5213 - Interdisciplinary Engineering
Module Delivered in:	2 programme(s)
Module Description:	Building Information Modelling (BIM) is revolutionising the way in which projects within the built environment are conceived, designed, constructed, operated and decommissioned. This module will provide the learner with an overview of the important themes in the growing field of BIM. The learner will study how new and emerging processes and technologies enable industry professionals to achieve more effective and sustainable buildings and infrastructure. This improved performance is supported by improved data management throughout the project lifecycle. The learner will also be introduced to Lean and examine how it might compliment BIM within the AEC sector.

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	Learning Outcome Description
LO1	Define and discuss the processes and technologies associated with BIM.
LO2	Identify and appraise the benefits of, and hindrances to, inter-disciplinary collaboration from people, process and interoperability of technology perspectives.
LO3	Identify and apply key industry standards and protocols in the development of Employer Information Requirements (EIR) and BIM Execution Plan (BEP)
LO4	Define Lean principles and evaluate appraise the potential benefits of Lean in sustainable design & construction.
LO5	Examine the principles of lean and evaluate the relative merits of adopting Lean and BIM in synergy.
Dependencies	
Module Recommendations	
Incompatible Modules	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
No requirements listed	

Indicative Content	
Building Information Modelling (BIM) General principles; Methodologies; Technologies; BIM development within industry.	
BIM Process Digital Plan of Work; Information delivery cycle highlighting the need for proper documentation and clear definition of requirements (PAS 1192).	
BIM Framework Documents Employer's Information Requirements; BIM Protocol incorporation into contracts; Organisational and project BIM Execution planning.	
Lean Lean principles; Lean in the AEC sector; Potential frameworks for adopting Lean and BIM strategies in synergy.	

Module Content & Assessment	
Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework			
Assessment Type	Presentation	% of Total Mark	15
Timing	Week 3	Learning Outcomes	1,2
Assessment Description Evaluate and present a published case study which demonstrates the benefits and/or challenges to implementing BIM within the Architecture, Construction and Engineering (AEC) sector.			
Assessment Type	Project	% of Total Mark	15
Timing	Week 5	Learning Outcomes	1,2,3
Assessment Description Based on a brief, develop an Employer's Information Requirements (EIR) specification.			
Assessment Type	Project	% of Total Mark	20
Timing	Week 7	Learning Outcomes	1,2,3
Assessment Description Develop a BIM Execution Plan (BEP) in response to an EIR specification.			
Assessment Type	Open-book Examination	% of Total Mark	50
Timing	Sem End	Learning Outcomes	1,2,3,4,5
Assessment Description End of semester Open Book Assessment			
No End of Module Formal Examination			
Reassessment Requirement			
Coursework Only This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.			

Module Workload

Workload: Full Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Delivery of module content.	Every Week	3.00	3
Independent & Directed Learning (Non-contact)	Non Contact	Revision of lecture material; Self directed learning; Completion of assignments.	Every Week	4.00	4
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					3.00

Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Delivery of module content.	Every Week	3.00	3
Independent & Directed Learning (Non-contact)	Non Contact	Revision of lecture material; Self directed learning; Completion of assignments.	Every Week	4.00	4
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					3.00

Module Resources

Recommended Book Resources

Gary Santorella. (2017), Lean Culture for the Construction Industry: Building Responsible and Committed Project Teams, Second. CRC Press, [ISBN: 9781498787246].
 Rafael Sacks, Chuck Eastman, Ghang Lee, Paul Teicholz. (2018), BIM Handbook: A Guide to Building Information Modeling for Owners, Designers, Engineers, Third. John Wiley & Sons, New Jersey USA, [ISBN: 978111928753].
 Nawari O. Nawari, Michael Kuenstle. (2015), Building information modeling: framework for structural design, First. CRC Press, Taylor & Francis, [ISBN: 9781482240436].

Supplementary Book Resources

Dominik Holzer. (2016), The BIM Manager's Handbook: Guidance for Professionals in Architecture, Engineering, and Construction, First. John Wiley & Sons, [ISBN: 9781118982426].
 Karen M. Kensek. (2014), Building Information Modeling, First. Routledge, US, p.312, [ISBN: 978-0-415-71773-1].
 Peter Barnes and Nigel Davies. (2015), BIM in Principle and in Practice, Second. ICE Publishing, UK, [ISBN: 9780727760920].
 Raja R.A. Issa, Svetlana Olbina. (2015), Building Information Modeling : Applications and Practices, First. American Society of Civil Engineers, [ISBN: 9780784479131].
 Richard Garber. (2014), BIM Design: Realising the Creative Potential of Building Information Modelling, First. John Wiley & Sons Ltd, UK, [ISBN: 978-1-118-71976-3].
 Steve Race. (2013), BIM Demystified, Second. RIBA, UK, [ISBN: 9781859465202].
 Ray Crotty. (2012), The Impact of Building Information Modelling, First. Spon Press, US & Canada, [ISBN: 978-0-415-60167-2].

Supplementary Article/Paper Resources

Ozan Koseoglu, Mehmet Sakin, Yusuf Arayici. (2018), Exploring the BIM and lean synergies in the Istanbul Grand Airport construction project, Engineering, Construction and Architectural Management, vol. 25, issue 10.

Other Resources

Website, Lean Construction Institute,
<http://www.leanconstruction.org>
 Website, RIAI BIM Pack, Ireland, RIAI,
http://www.riai.ie/consumer_services/wor_king_with_an_architect_-_larger_projects/building_information_modelling_bim/
 Website, (2018), CIF BIM Starter Pack, Ireland, CIF,
https://cif.ie/wp-content/uploads/2018/1/1/BIM-Starter-Pack-LBIC-CIF-ZZ-XX-GD-Z-0_003.pdf
 Website, NBS BIM Toolkit, UK, NBS,
<https://toolkit.thenbs.com/>
 Website, Building Information Modelling, UK, Scottish Futures Trust,
<https://bimportal.scottishfuturestrust.org.uk/>
 Website:, Construction Project Information Committee (CPIC),
<http://www.cpic.org.uk/>
 Website:, Building Smart International,
<http://www.buildingsmart.org/>
 Standard, ISO 19650-1:2018 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 1: Concepts and p, International Standards Organisation (ISO).
 Standard, ISO 19650-2:2018 Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) - Information management using building information modelling - Part 2: Delivery phase, International Standards Organisation (ISO).
 Standard, BS 7000-4:2013 Design management systems. Guide to managing design in construction, UK, BSI.
 Standard, BS/PAS 1192 Series of Standards, UK, BSI.

Module Delivered in

Programme Code	Programme	Semester	Delivery
CR_CBIMM_8	Bachelor of Science (Honours) in Building Information Modelling and Management	-1	Mandatory
CR_CSBIM_8	Certificate in Strategic Building Information Modelling Management	-1	Mandatory