

DESI8018: Design Thinking for BIM

Module Details

Module Code:	DESI8018
Title:	Design Thinking for BIM APPROVED
Long Title:	Design Thinking for BIM
NFQ Level:	Advanced
Valid From:	Semester 1 - 2019/20 (September 2019)
Duration:	1 Semester
Credits:	5
Field of Study:	2140 - Design Studies
Module Delivered in:	3 programme(s)
Module Description:	This module aims to provide the learner with the necessary knowledge and skills to apply a design thinking methodology within a Building Information Modelling (BIM) context. Learners will develop skills in identifying and observing barriers to the effective and efficient use of human resources, processes and technologies in practice. In response to identified problems, learners will adopt a design thinking methodology to develop creative solutions.

Learning Outcomes

On successful completion of this module the learner will be able to:

#	Learning Outcome Description
LO1	Appraise the design thinking methodology within the wider methodological landscape in order to innovate within a BIM context.
LO2	Apply design thinking to develop and evaluate creative solutions to project-based problems.
LO3	Synthesise, visualise, communicate, and present findings from a design thinking project.
LO4	Apply the skills required for team members in design thinking projects.
LO5	Develop abilities to reflect on the student's own learning approach and recognise characteristics which will support lifelong learning abilities and attitudes.

Dependencies

Module Recommendations

Incompatible Modules

No incompatible modules listed

Co-requisite Modules

No Co-requisite modules listed

Requirements

No requirements listed

Indicative Content

Context

The fast evolving processes and technologies symptomatic of BIM mean that Architectural, Engineering and Construction (AEC) sector professionals will need to be agile and have well developed lifelong learning attitudes and abilities. BIM is perceived as a disruptive technology which will require innovative change management techniques to educate/upskill the people driving the processes and technologies.

Strategy

Develop the necessary knowledge and skills to apply a design thinking methodology with a BIM context. Potential for design thinking to enable improved performance of people, process and technology.

Methodologies

Operationalising design thinking in lean and agile ways to enable optimum performance. Observe users/issues; Develop empathy; Research and define problem(s)/issue(s) by including multiple stakeholders as necessary; Develop potential solutions using co-design and co-create as appropriate; Evaluate design outcomes to select effective and sustainable solutions. Evaluate, appraise and measure excellence in design thinking projects.

Research

Define problem and subsequent research objectives, present assumptions, collect quality data, analyse and interpret data, establish findings by synthesis, identify potential applications of research within, and beyond, the scope of the defined research objective.

Communication

Exploration of various means of communicating design thinking outcomes and their importance in achieving successful outcomes. Methods considered include verbal, sketching, infographics, posters, 3D digital models, physical models, immersive experiences including virtual and augmented reality.

Multi-disciplinary Teamwork

Collaborating as a multidisciplinary team to leverage discipline specific knowledge and skills in overcoming barriers to innovation and developing sustainable solutions. Identify and experience the role of blending autonomous work with teamwork in achieving optimum project outcomes.

Reflection

Recognise and experience the benefits of reflection in practice. Use personal reflection to identify optimum learning approaches to support lifelong learning attitudes and abilities.

Module Content & Assessment

Assessment Breakdown	%
Coursework	100.00%

Assessments

Coursework			
Assessment Type	Reflective Journal	% of Total Mark	25
Timing	Every Week	Learning Outcomes	5
Assessment Description Online/hardcopy reflective journal to be updated on a weekly basis, identifying and evaluating the student's key learning outcomes from experiences in the design thinking based projects. In week 12, students will be required to present a synthesis of their reflective journal which concisely evaluates the learning achieved and identifies optimum learning methods.			
Assessment Type	Critique	% of Total Mark	25
Timing	Week 4	Learning Outcomes	1,2,3,4
Assessment Description Project A: In response to a project brief, develop and evaluate potential solutions prior to selecting a preferred solution. Present the design evolution in poster format for use in a combined tutor/peer critique.			
Assessment Type	Project	% of Total Mark	50
Timing	Week 12	Learning Outcomes	1,2,3,4

Assessment Description Project B: In response to a project brief, develop multiple design solutions using a design thinking methodology. Present project work in a manner that clearly demonstrates the design evolution for the entire project. The portfolio element may include report, sketches, infographic, and/or virtual experience.
No End of Module Formal Examination
Reassessment Requirement
Coursework Only <i>This module is reassessed solely on the basis of re-submitted coursework. There is no repeat written examination.</i>

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	1.00	1
Lecturer-Supervised Learning (Contact)	Contact	Workshop; Research; Project work for formative/summative assignments.	Every Week	3.00	3
Independent & Directed Learning (Non-contact)	Non Contact	Revision of lecture content; Research; Project work for formative/summative assignments.	Every Week	3.00	3
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					4.00
Workload: Part Time					
Workload Type	Contact Type	Workload Description	Frequency	Average Weekly Learner Workload	Hours
Lecture	Contact	Delivery of module content.	Every Week	1.00	1
Lecturer-Supervised Learning (Contact)	Contact	Workshop; Research; Project work for formative/summative assignments.	Every Week	3.00	3
Independent & Directed Learning (Non-contact)	Non Contact	Revision of lecture content; Research; Project work for formative/summative assignments.	Every Week	3.00	3
Total Hours					7.00
Total Weekly Learner Workload					7.00
Total Weekly Contact Hours					4.00

Module Resources
Recommended Book Resources
<p>Michael Lewrick. (2018), The Design Thinking Playbook: Mindful Digital Transformation of Teams, Products, Services, Businesses and Ecosystems, First. John Wiley & Sons, [ISBN: 9781119467472].</p> <p>Dubberly, Hugh. (2008), How do you design? A Compendium of Models, First. Dubberly Design Office, www.dubberly.com/articles/how-do-you-design.html.</p> <p>Tim Brown. (2009), Change by Design - How Design Thinking Transforms Organizations and Inspires Innovation, First. HarperCollins, [ISBN: 9780061766084].</p> <p>Colin Gray, Will Hughes. (2001), Building design management, First. Butterworth-Heinemann, [ISBN: 9780750650700].</p> <p>Donald A. Schon. (1984), The Reflective Practitioner: How Professionals Think In Action, First. Basic Books, [ISBN: 9780465068784].</p>
Supplementary Book Resources
<p>Robert Curedale. (2016), Design Thinking Process and Methods, Third. Design Community College Inc., [ISBN: 9781940805498].</p> <p>Robert Curedale. (2012), Design Methods 1: 200 ways to apply design thinking (Volume 1), First. Design Community College Inc., [ISBN: 9780988236202].</p> <p>Robert Curedale. (2016), Design Methods 2: 200 More Ways to Apply Design Thinking, First. Design Community College Inc., [ISBN: 9780988236271].</p> <p>Thomas Lockwood. (2009), Design Thinking: Integrating Innovation, Customer Experience, and Brand Value, First. Allworth Press, [ISBN: 9781581156683].</p> <p>Michael G. Luchs, Scott Swan, Abbie Griffin. (2015), Design Thinking: New Product Development Essentials from the PDMA, First. Wiley, [ISBN: 9781118971].</p> <p>Haik, Yousef; Shahin, T. M.. (2011), Engineering design process, Second. Cengage Learning, [ISBN: 9780495668814].</p> <p>Ray Holland, Busayawan Lam. (2014), Managing Strategic Design, First. Macmillan International Higher Education, [ISBN: 9781137325952].</p> <p>John Hayes. (2018), The Theory and Practice of Change Management, Fifth. Palgrave, [ISBN: 9781352001327].</p> <p>Laurie J Mullins, Gill Christy. (2016), Management and organisational behaviour, Eleventh. Pearson Education Limited, [ISBN: 9781292088488].</p> <p>Edward de Bono. (1999), Six Thinking Hats, Revised. Penguin Books, [ISBN: 9780141033051].</p> <p>Edward de Bono. (2009), Lateral Thinking: A Textbook of Creativity, First. Penguin Life, [ISBN: 9780241257548].</p> <p>Tom Kelley. (2001), The Art Of Innovation: Lessons in Creativity from IDEO, America's Leading Design Firm, First. Profile Books, [ISBN: 9781781256145].</p>
Recommended Article/Paper Resources
<p>Jon Kolko. (2015), Design Thinking Comes of Age, Harvard Business Review, p.66-71, https://hbr.org/2015/09/design-thinking-comes-of-age</p> <p>Tim Brown. (2008), Design Thinking, Harvard Business Review, p.84-95.</p> <p>Katja Thoring, Roland Mueller. (2011), Understanding design thinking: A process model based on method engineering, International Conference on Engineering and Product Design Education.</p>
Other Resources
<p>Website, d.school (Stanford University), http://www.dschool.stanford.edu/resource%20s/</p> <p>Website, NUIG. Top tips for reflective practice and reflective writing, http://www.nuigalway.ie/academic-skills/ criticalthinking/downloads/Top-tips-for- reflective-practice-and-writing.pdf</p>

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
CR_CABIM_9	Postgraduate Diploma in Science in Applied Building Information Modelling and Digital AEC	-1	Elective