UNSW SYDNEY | Australia's Global University

Built Environment

CODE2170
Building Information Modelling

Dr Lan Ding

3+ Abbreviated Course Outline – T1 and T3

Disclaimer

This abbreviated course outline is indicative of the outcomes, delivery and assessment. While Course Learning Outcomes will remain constant, other details may be subject to change. The full and most accurate course outline will be available in Moodle.

1. COURSE STAFF

Course Convenor	Dr Lan Ding
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2. COURSE DETAILS

Credit Points: 6 UoC

Learning Activity	Hours per week
Lecture	1
Studio	1
Computer Lab	3
Online learning activity	1

Description

The Building Information Modelling course introduces students to identify and explain concepts and methods of Building Information Management (BIM), BIM standards, and BIM in an urban context. Students investigate and explain high-performance building desgign through Building Information Modelling (BIM) and analysis, while applying advanced skills in Building Information Management (BIM) for the design, documentation and visualisation of buildings. Students will collaborate in multi-disciplinary teams to achieve optimal design solutions, and their performance will be evaluated with respect to their progressive work developed in preparation for or during the studio activities.

Program Learning Outcomes (PLOs)

The Computational Design Program Learning Outcomes addressed in this course are:

1. Synthesise interdisciplinary knowledge of cultural, natural, and technological systems in local and global contexts.
2. Apply interdisciplinary knowledge using computational design thinking and methods to built environment challenges.
3. Critically analyse complex environmental conditions through digital technologies and computational methods.
4. Apply computational design knowledge and skills for professional work and, or further learning.
5. Practice the ethical application of digital and computational technologies in and for the design of the built environment.

Course Learning Outcomes (CLOs) with Alignment to PLOs and Assessment

CLO #	CLO Statement	PLO #	Related Assessment
CLO 1	Explain concepts and methods of Building Information Modelling (BIM), BIM standards, and BIM in urban context.	4, 5	Assignment 1 Building Information Modelling (BIM) Project
CLO 2	Apply advanced skills in Building Information Modelling (BIM) for the design, documentation and visualization of buildings.	4, 5	Assignment 1 Building Information Modelling (BIM) Project

CLO 3	Achieve high-performance building design through Building Information Modelling (BIM) and analysis	2, 3, 4, 5	Assignment 2 Integration of BIM-based multi-disciplinary performance analysis with design
CLO 4	Apply advanced skills in Building Information Modelling (BIM) to collaborate in multi-disciplinary teams to achieve optimal design solutions	2, 3, 4, 5	Assignment 2 Integration of BIM-based multi-disciplinary performance analysis with design

3. ASSESSMENT

Assessment Task	Weight	Course Learning Outcomes Assessed	Due Date
1. Quiz	5%	CLO1	Week 3
2. Building Information Modelling (BIM) Project	50%	CLO1, CLO2	Week 6
3. Integration of BIM-based multi-disciplinary performance analysis with design	45%	CLO3, CLO4	Wee 10

4. WEEKLY COURSE SCHEDULE

Week	Topic	Activity	Related CLO
Week 1	BIM Concepts, Methods and Processes	• Learn BIM concepts, methods and processes by reading lecture notes and reference articles • Understand Assignment 1 project requirements. • Hands-on practice on Revit user interface and modelling functions. • Plan for the building design based on the site given and design requirements.	CLO1
Week 2	Revit as an Example of BIM Application	• Learn Revit modelling functions. • Model the site topography and boundary. • Establish building storeys and floor levels of the design.	CLO1, CLO2
Week 3	BIM Standards and Industry Foundation Classes (IFC)	• Learn BIM standards and Industry Foundation Classes by reading lecture notes and reference articles. • Model building elements of the design, including walls, windows, columns, roofs, spaces, etc.	CLO1, CLO2
Week 4	BIM and Parametric Modelling	• Learn the knowledge of parametric modelling by reading lecture notes and refence articles. • Enrich building elements and specify materials information in the model. • Dimension and annotate the drawings.	CLO1, CLO2
Week 5	The link between BIM & Dynamo	• Learn the knowledge of Dynamo and the link of Dynamo with BIM by reading lecture notes. • Create a detailed wall section showing an understanding of construction details	CLO1, CLO2, CLO3

		• Create 3D rendering of the model	
Week 6	Rule-based Model Checking	• Learn rule-based model checking by reading lecture notes and applying Solibri Model Checker tool. • Complete the design model. • Export the final drawing set of the design model to PDF.	CLO3
Week 7	BIM for Design Analysis and Team Collaboration	• Learn BIM-based design analysis including energy performance analysis, cost analysis and building code compliance analysis by reading lecture notes, reference articles and Building Code of Australia. • Understand assignment 2 project requirements. • Establish teams and agree analysis roles. • Select a design model completed by a team member in the assignment 1 to undertake design analysis.	CLO3, CLO4
Week 8	BIM for Life Cycle Analysis of Design	• Learn the knowledge of life cycle analysis (LCA) of building design and BIM for LCA by reading lecture notes and reference articles. • Undertake design analysis using one of BIM-based analysis tools (Energy Analysis in Revit, Insight 360, Solibri Model Checker, Cost X, etc)	CLO3, CLO4
Week 9	Integration of BIM and GIS	• Learn the knowledge of integrating BIM with GIS by reading lecture notes and reference articles. • Discuss with team members on key issues identified and potential design changes to improve the performance of the design model.	CLO1, CLO3
Week 10	BIM and 3D Collaborative Virtual Environments	• Learn the knowledge and methods of integrating BIM with 3D collaborative virtual environments • Complete the assignment 2 project report.	CLO3, CLO4