



BLCN29005 *Building Information Modelling (BIM)*

Term 1 - 2024

Profile information current as at 03/05/2024 08:59 am

All details in this unit profile for BLCN29005 have been officially approved by CQUniversity and represent a learning partnership between the University and you (our student). The information will not be changed unless absolutely necessary and any change will be clearly indicated by an approved correction included in the profile.

General Information

Overview

The adoption of Building Information Modelling (BIM) that is developing into Building Lifecycle Management (BLM) within the built environment is an advanced and developing technology that offers significant productivity, technical and environmental benefits. Governments around the world have mandated BIM use in their projects and various Australian governments and commercial developers are adopting this practice. In this unit, you will develop fundamental BIM knowledge and competencies which are rapidly becoming a core requirement for design and construction professionals. You will learn about recent developments in a construction-related discipline and/or area of professional practice. You will develop your understanding of research principles and methods applicable to your field of work and learn skills (BIM visualisation, creation and maintenance) essential for the successful adoption and maintenance of BIM in the construction industry, especially in the context of construction management. The client's post-construction use of BIM will be critically studied.

Details

Career Level: *Postgraduate*

Unit Level: *Level 9*

Credit Points: 6

Student Contribution Band: 8

Fraction of Full-Time Student Load: 0.125

Pre-requisites or Co-requisites

Prerequisites: BLCN29001 Construction Technology BLCN29003 Construction Measurement AND BLCN29004 Construction Cost Planning

Important note: Students enrolled in a subsequent unit who failed their pre-requisite unit, should drop the subsequent unit before the census date or within 10 working days of Fail grade notification. Students who do not drop the unit in this timeframe cannot later drop the unit without academic and financial liability. See details in the [Assessment Policy and Procedure \(Higher Education Coursework\)](#).

Offerings For Term 1 - 2024

- Brisbane
- Sydney

Attendance Requirements

All on-campus students are expected to attend scheduled classes – in some units, these classes are identified as a mandatory (pass/fail) component and attendance is compulsory. International students, on a student visa, must maintain a full time study load and meet both attendance and academic progress requirements in each study period (satisfactory attendance for International students is defined as maintaining at least an 80% attendance record).

Website

[This unit has a website, within the Moodle system, which is available two weeks before the start of term. It is important that you visit your Moodle site throughout the term. Please visit Moodle for more information.](#)

Class and Assessment Overview

Recommended Student Time Commitment

Each 6-credit Postgraduate unit at CQUniversity requires an overall time commitment of an average of 12.5 hours of study per week, making a total of 150 hours for the unit.

Class Timetable

[Regional Campuses](#)

Bundaberg, Cairns, Emerald, Gladstone, Mackay, Rockhampton, Townsville

[Metropolitan Campuses](#)

Adelaide, Brisbane, Melbourne, Perth, Sydney

Assessment Overview

1. **Written Assessment**

Weighting: 20%

2. **Written Assessment**

Weighting: 40%

3. **Practical Assessment**

Weighting: 40%

Assessment Grading

This is a graded unit: your overall grade will be calculated from the marks or grades for each assessment task, based on the relative weightings shown in the table above. You must obtain an overall mark for the unit of at least 50%, or an overall grade of 'pass' in order to pass the unit. If any 'pass/fail' tasks are shown in the table above they must also be completed successfully ('pass' grade). You must also meet any minimum mark requirements specified for a particular assessment task, as detailed in the 'assessment task' section (note that in some instances, the minimum mark for a task may be greater than 50%). Consult the [University's Grades and Results Policy](#) for more details of interim results and final grades.

CQUniversity Policies

All University policies are available on the [CQUniversity Policy site](#).

You may wish to view these policies:

- Grades and Results Policy
- Assessment Policy and Procedure (Higher Education Coursework)
- Review of Grade Procedure
- Student Academic Integrity Policy and Procedure
- Monitoring Academic Progress (MAP) Policy and Procedure – Domestic Students
- Monitoring Academic Progress (MAP) Policy and Procedure – International Students
- Student Refund and Credit Balance Policy and Procedure
- Student Feedback – Compliments and Complaints Policy and Procedure
- Information and Communications Technology Acceptable Use Policy and Procedure

This list is not an exhaustive list of all University policies. The full list of University policies are available on the [CQUniversity Policy site](#).

Previous Student Feedback

Feedback, Recommendations and Responses

Every unit is reviewed for enhancement each year. At the most recent review, the following staff and student feedback items were identified and recommendations were made.

Feedback from This document

Feedback

No previous data recorded as this was the first time the unit was presented.

Recommendation

At this stage no recommendation due to insufficient data.

Unit Learning Outcomes

On successful completion of this unit, you will be able to:

1. Critically analyse the development and function of Building Information Modelling and Building Life-cycle Modelling processes as related to contemporary construction practice and identify the affiliated professions in Building Information Modelling use and development
2. Apply advanced, creative, collaborative techniques and theoretical knowledge in Building Information Modelling and Building Life-cycle Modelling to optimise constructability and reduce the risk of errors
3. Apply theoretical and professional knowledge in Building Information Modelling and Building Life-cycle Modelling to design, plan and execute a substantial research-based project.

Alignment of Learning Outcomes, Assessment and Graduate Attributes



Alignment of Assessment Tasks to Learning Outcomes

Assessment Tasks	Learning Outcomes		
	1	2	3
1 - Written Assessment - 20%	•	•	
2 - Practical Assessment - 40%			•

Alignment of Graduate Attributes to Learning Outcomes

Graduate Attributes	Learning Outcomes		
	1	2	3
1 - Knowledge	○	○	○
2 - Communication	○	○	○
3 - Cognitive, technical and creative skills	○	○	○

Graduate Attributes	Learning Outcomes		
	1	2	3
4 - Research	○	○	○
5 - Self-management			
6 - Ethical and Professional Responsibility	○	○	
7 - Leadership			
8 - Aboriginal and Torres Strait Islander Cultures			

Alignment of Assessment Tasks to Graduate Attributes

Assessment Tasks	Graduate Attributes							
	1	2	3	4	5	6	7	8
1 - Written Assessment - 20%	○	○	○	○				
2 - Written Assessment - 40%	○		○			○		
3 - Practical Assessment - 40%	○	○	○	○				

Textbooks and Resources

Textbooks

There are no required textbooks.

IT Resources

You will need access to the following IT resources:

- CQUniversity Student Email
- Internet
- Unit Website (Moodle)
- Access to Microsoft software such as PowerPoint, MS Project and Visio
- Autodesk Revit 2023 (Educational Version downloaded for free from Autodesk.com)
- Autodesk Navisworks Manage 2023 (Educational Version downloaded for free from Autodesk.com)

Referencing Style

All submissions for this unit must use the referencing style: [Harvard \(author-date\)](#)

For further information, see the Assessment Tasks.

Teaching Contacts

Chamil Erik Ramanayaka Unit Coordinator
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Schedule

Week 1 - 04 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
Introduction to BIM and Revit		<p>Work your way through the weekly materials as described below</p> <ul style="list-style-type: none">• Read Week 01 Lecture Notes• Participate in Week 01 Lecture• Complete Learning Activity 01• Participate in Week 01 Tutorial Class <p>By the end of this week, you will;</p> <ul style="list-style-type: none">• Learning objective 1: Define BIM as an information management methodology relying on digitalisation and collaboration.• Learning objective 2: Identify the power of BIM in 'I' – i.e., information.• Learning objective 3: Identify the merits of object-oriented and parametric modelling compared to traditional CAD drafting.• Learning objective 4: Explain Common Data Environment (CDE), and CDE's quality assurance requirements.• Learning objective 5: Identify the purpose of BIM standards.

Week 2 - 11 Mar 2024

Module/Topic	Chapter	Events and Submissions/Topic
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BIM uses and deliverables over the project life cycle and Revit parameters and applications

Work your way through the weekly materials as described below;

- Read Week 02 Lecture Notes
- Watch Week 02 Lecture
- Complete Learning Activity 01

• Participate in Week 02 Tutorial Class

• Respond to Moodle threads
You will achieve the following learning objectives:

Objective1. Identify BIM uses over the project life-cycle

Objective2. Describe potential value from each BIM use and the challenges to

implementing them in a project environment

Objective3. Align BIM potential uses with project

management objectives and describe how a project team

decides to implement a BIM use in a project

Objective4. Explain the concept of Level of Development (LOD)

Week 3 - 18 Mar 2024

Module/Topic

Chapter

Events and Submissions/Topic

Interoperability issues and solutions including Industry Foundation Classes (IFC) and Modelling parametric objects using Revit

Work your way through the weekly materials as described below;

- Discuss Task 1 and 2 of Week 2 (from the lecture) answers with your lecturer during the lecture
- Read Week 03 Lecture Notes
- Participate/Watch Week 03 Lecture
- Participate in Week 03 Tutorial Class
- Respond to Moodle threads created by the end of the week

You will achieve the following learning objectives:

Objective 01. Define interoperability and identify its consequences for BIM implementation

Objective 02. Discuss solutions to interoperability, including non-proprietary, neutral data formats

Objective 03. Learn to create Revit families

Week 4 - 25 Mar 2024

Module/Topic

Chapter

Events and Submissions/Topic

Defining and cascading
Employer's Information
Requirements (EIR) using ISO
19650 fundamentals and
Performance-based design using
Revit

Work your way through the
weekly materials as described
below;

- Download a copy of AS ISO
19650 - Part 1 (2019) from
the CQU Library
- Read Week 04 Lecture Notes
- Participate/Watch Week 04
Lecture
- Participate in Week 04
Tutorial Class
- Respond to Moodle threads
and Learning Activities
created by the end of the
week

You will achieve the following
learning objectives:

- Objective 01. Identify why ISO
19650 standards are
important for BIM
implementation
- Objective 02. Be familiar with
OIR, AIR, PIR and EIR
- Objective 03. Identify how the
appointing party cascades
OIRs down the supply chain
- Objective 04. Explain how
design performance could be
enhanced in design authoring
through model-based
collaboration

Week 5 - 01 Apr 2024

Module/Topic

Chapter

Events and Submissions/Topic

Roles and responsibilities of the client and the supply chain under BIM implementation and Introduction to Navisworks: Federated model

Work your way through the weekly materials as described below;

- Download a copy of AS ISO 19650 - Part 2 (2019) from the CQU Library
- Read Week 05 Lecture Notes
- Participate/Watch Week 05 Lecture
- Participate in Week 05 Tutorial Class
- Respond to Moodle threads and Learning Activities created by the end of the week

You will achieve the following learning objectives:

Lecture

Objective 01. Identify OIR, AIR and PIR with respect to a practical scenario

Objective 02. Explain the information management process using ISO 19650: Part 1

Objective 03. Recognise the generic structure of a BIM team

Objective 04. Explain the activities associated with the information management process in the delivery phase using ISO 19650: Part 2 Tutorial

Objective 01. Be familiar with the Navisworks Manage 2023 interface

Objective 02. Learn to create a federated model

Objective 03. Identify Navisworks file types and their applications

Objective 04. Learn basic Navisworks skills - such as navigating through a model, selection tree, and creating sets

Vacation Week - 08 Apr 2024

Module/Topic	Chapter	Events and Submissions/Topic
Week 6 - 15 Apr 2024		
Module/Topic	Chapter	Events and Submissions/Topic

Quality assurance in the Common Data Environment (CDE) and design review and validation using Navisworks

ASSESSMENT 1 - DUE

Work your way through the weekly materials as described below;

- Read Week 06 Lecture Notes
- Participate/Watch Week 06 Lecture
- Participate in Week 06 Tutorial Class
- Respond to Moodle threads and Learning Activities created by the end of the week
- Refer to additional reading to enhance your knowledge of ISO 19650: Part 2 implementation

You will achieve the following learning objectives:

Lecture

Objective 01. Enhance student's understanding of CDE

Objective 02. Understand the need for a federation strategy

Objective 03. Explain the importance of naming conventions for information containers

Objective 04. Explain the necessity of metadata in document management

Tutorial

Objective 01. Master Navisworks navigation skills

Objective 02. Understand and use Selection Tree efficiently

Objective 03. Know Navisworks Selection Resolutions and the effect on Navisworks parameters

Objective 04. Create selection and search sets and know the difference between them

Objective 05. Use 'Review' and 'Find Items' to check design compliance

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Objective 05. Use 'Review' and 'Find Items' to check design compliance

Assessment 1 (Research -based)

Due: Week 6 Friday (19 Apr 2024)

11:59 pm AEST

Week 7 - 22 Apr 2024

Module/Topic

Chapter

Events and Submissions/Topic

BIM Execution Plan: Part 1
and 4D BIM

Work your way through the weekly materials as described below;

- Read Week 07 Lecture Notes
- Participate/Watch Week 07 Lecture

- Participate in Week 07 Tutorial Class

- Respond to Moodle threads and Learning Activities created by the end of the week

- Refer to additional reading to enhance your knowledge of ISO 19650: Part 2 implementation

You will achieve the following learning objectives:

Lecture

Objective 01. Explain the requirement of a BIM Execution Plan (BEP)

Objective 02. Understand the process of creating BEP

Objective 03. Understand the content of BEP

Tutorial

Objective 01. Understand the benefits and limitations of 4D modelling compared to other project planning software applications (MS Project)

Objective 02. Use Revit Phases to communicate a design effectively

Objective 03. Use Revit Phases for cost-driven decision making

Objective 04. Use Navisworks Timeliner tools to create 4D models including planned, and planned versus actual simulations

Week 8 - 29 Apr 2024

Module/Topic

Chapter

Events and Submissions/Topic

BIM Execution Plan: Part 2
and Clash Detective

Work your way through the weekly materials as described below;

- Read Week 08 Lecture Notes
- Participate/Watch Week 08 Lecture

- Participate in Week 08 Tutorial Class

You will achieve the following learning objectives:

Lecture

Objective 01. Develop information exchanges

Objective 02. Define supporting infrastructure for BIM implementation

Objective 03. Learn Fundamental Principles of information container-based collaborative working

Objective 04. Know Delivery team capability and capacity

Objective 05. Understand Responsibility matrix, Task Information Delivery Plans (TIDPs) and Master Information Delivery Plan (MIDP)

Tutorial

You will learn:

Objective 01. How to avoid clashes proactively

Objective 02. Interference check while authoring design models

Objective 03. Navisworks Manage Clash Detective

Objective 04. Why practical considerations are critical for designing clash-detection tests

Objective 05. Detailed process map for clash detection

Week 9 - 06 May 2024

Module/Topic

Chapter

Events and Submissions/Topic

Guest lecture (To be confirmed)
and Use of Visio for BIM process
mapping

Work your way through the
weekly materials as described
below;

- Read Week 09 Guest Lecture
Notes
- Participate/Watch Week 09
Guest Lecture
- Participate in Week 09
Tutorial Class
- Respond to Moodle threads
and Learning Activities
created by the end of the
week

You will achieve the following
learning objectives:

Objective1. Develop our Visio
skills to develop BIM process
maps

Objective2. Develop a
Timeliner-integrated Clash
Detective using Navisworks
Manage to minimise clashes
among MEP work packages

Objective 3. Understand the
practical applications of BIM in
the Australian Construction
Industry

Week 10 - 13 May 2024

Module/Topic

Chapter

Events and Submissions/Topic

Construction Operations Building Information Exchange (COBie) and Preparing a COBie output

Work your way through the weekly materials as described below;

- Read Week 10 Lecture Notes
- Participate/Watch Week 10 Lecture
- Participate in Week 10 Tutorial Class
- Respond to Moodle threads and Learning Activities created by the end of the week

You will achieve the following learning objectives:

Lecture:

Objective1. Understand COBie data schema

Objective2. Understand COBie's business value to clients, asset managers and facilities managers

Objective3. Understand COBie process

Tutorial:

Objective 1: Learn to use design authoring tools to produce a COBie outcome

Week 11 - 20 May 2024

Module/Topic

Chapter

Events and Submissions/Topic

Integrated Project Delivery (IPD)
and 5D BIM

ASSESSMENT 2 - DUE
Work your way through the
weekly materials as described
below;

- Read Week 11 Lecture Notes
- Participate/Watch Week 11
Lecture
- Participate in Week 11
Tutorial Class

You will achieve the following
learning objectives:

Lecture

Objective1. Understand
contract arrangements

facilitating collaborative BIM

Objective2. Define IPD and its
key values

Tutorial

Objective1. Understand 5D
BIM

Objective2. Practice

Navisworks Quantification for
automatic extraction of
quantities

Assessment 2 (ONLINE QUIZ) Due:
Week 11 Friday (24 May 2024) 11:59
am AEST

Week 12 - 27 May 2024

Module/Topic

Chapter

Events and Submissions/Topic

Revision and assessment support (
practical assessment)

ASSESSMENT 3 - DUE

Work your way through the
weekly materials as described
below;

- Watch Week 12 Lecture
- Participate in Week 12
Tutorial Class

You will achieve the following
learning objectives:

Objective (Lecture):

Summarise the learning
outcomes of the semester

Objective (Tutorial): Get
assistance with Assessment 03
issues

ASSESSMENT 3

(PRACTICAL) Due: Week 12
Friday (31 May 2024) 11:59
pm AEST

Review/Exam Week - 03 Jun 2024

Module/Topic

Chapter

Events and Submissions/Topic

Term Specific Information

Please refer to CQU Guidelines for referencing Large Language Models or Artificial Intelligence in your assignments

Assessment Tasks

1 Assessment 1 (Research -based)

Assessment Type

Written Assessment

Task Description

Assessment 1 is a group assessment, and a group could consist of members up to 04.

Assessment 1 evaluates students' knowledge and skills in digitising and managing information related to construction projects using BIM. In addition to the first four topics (Week 1-5) discussed in the lecture, students will undertake substantial research to complete Assessment 1. Students will refer to a given Scenario and identify the project and asset management objectives. After that, students will identify Organisational Information Requirements (OIRs) to pursue the identified project and asset management objectives. Students will demonstrate how OIRs are cascaded down the supply chain and how PIM (Project Information Model) and AIM (Asset Information Model) are delivered by the supply chain to fulfil OIRs. Students will align BIM uses with the information requirements and discuss challenges project stakeholders face under BIM implementation from information management perspectives.

Assessment Due Date

Week 6 Friday (19 Apr 2024) 11:59 pm AEST

Submission must be via Turnitin

Return Date to Students

Week 8 Monday (29 Apr 2024)

Via Moodle

Weighting

20%

Assessment Criteria

SEE MODLE FOR DETAILS

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online Group

Submission Instructions

One submission per group

Learning Outcomes Assessed

- Critically analyse the development and function of Building Information Modelling and Building Life-cycle Modelling processes as related to contemporary construction practice and identify the affiliated professions in Building Information Modelling use and development
- Apply advanced, creative, collaborative techniques and theoretical knowledge in Building Information Modelling and Building Life-cycle Modelling to optimise constructability and reduce the risk of errors

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research

2 Assessment 2 (ONLINE QUIZ)

Assessment Type

Written Assessment

Task Description

Assessment 2 evaluates students' knowledge and skills about theoretical aspects and practical considerations of BIM. This online test will consist of multiple choices and short written responses. The questions are from the lecture contents from Week 5 to Week 11. Students will require a substantial understanding of ISO19650 and available Australian BIM implementation protocols. The quiz will focus on the following areas:

1. the roles and responsibilities of the client and the supply chain to manage information using the Common Data Environment (CDE)
2. Students' knowledge of CDE and skills in managing practical issues under CDE implementation)
3. Theoretical and practical aspects of a BIM Execution Plan (BXP)
4. Construction Operations Building Information Exchange (COBie)
5. Integrated Project Delivery (IPD)

Assessment Due Date

Week 11 Friday (24 May 2024) 11:59 am AEST
Completion via Moodle

Return Date to Students

Review/Exam Week Friday (7 June 2024)
Via Moodle

Weighting

40%

Assessment Criteria

SEE MOODLE FOR DETAILS

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Graduate Attributes

- Knowledge
- Cognitive, technical and creative skills
- Ethical and Professional Responsibility

3 ASSESSMENT 3 (PRACTICAL)

Assessment Type

Practical Assessment

Task Description

Assessment 3 evaluates knowledge of BIM and software skills concerning the delivery stage of construction projects. In addition to software skills gained from the tutorials, students will undertake research to complete this assessment. Students will use Autodesk Revit (2023) and Autodesk Navisworks (2023) to illustrate their skills on design changes, 3D coordination and 4D (time integration) and 5D (cost integration) modelling. In addition to digital skill development, it is expected that students will understand the benefits and challenges of BIM compared to traditional project delivery.

Assessment Due Date

Week 12 Friday (31 May 2024) 11:59 pm AEST
Submission must be via Turnitin

Return Date to Students

Via Moodle

Weighting

40%

Assessment Criteria

SEE MOODLE FOR DETAILS

Referencing Style

- [Harvard \(author-date\)](#)

Submission

Online

Learning Outcomes Assessed

- Apply theoretical and professional knowledge in Building Information Modelling and Building Life-cycle Modelling to design, plan and execute a substantial research-based project.

Graduate Attributes

- Knowledge
- Communication
- Cognitive, technical and creative skills
- Research

Academic Integrity Statement

As a CQUniversity student you are expected to act honestly in all aspects of your academic work.

Any assessable work undertaken or submitted for review or assessment must be your own work. Assessable work is any type of work you do to meet the assessment requirements in the unit, including draft work submitted for review and feedback and final work to be assessed.

When you use the ideas, words or data of others in your assessment, you must thoroughly and clearly acknowledge the source of this information by using the correct referencing style for your unit. Using others' work without proper acknowledgement may be considered a form of intellectual dishonesty.

Participating honestly, respectfully, responsibly, and fairly in your university study ensures the CQUniversity qualification you earn will be valued as a true indication of your individual academic achievement and will continue to receive the respect and recognition it deserves.

As a student, you are responsible for reading and following CQUniversity's policies, including the [Student Academic Integrity Policy and Procedure](#). This policy sets out CQUniversity's expectations of you to act with integrity, examples of academic integrity breaches to avoid, the processes used to address alleged breaches of academic integrity, and potential penalties.

What is a breach of academic integrity?

A breach of academic integrity includes but is not limited to plagiarism, self-plagiarism, collusion, cheating, contract cheating, and academic misconduct. The Student Academic Integrity Policy and Procedure defines what these terms mean and gives examples.

Why is academic integrity important?

A breach of academic integrity may result in one or more penalties, including suspension or even expulsion from the University. It can also have negative implications for student visas and future enrolment at CQUniversity or elsewhere. Students who engage in contract cheating also risk being blackmailed by contract cheating services.

Where can I get assistance?

For academic advice and guidance, the [Academic Learning Centre \(ALC\)](#) can support you in becoming confident in completing assessments with integrity and of high standard.

What can you do to act with integrity?



Be Honest

If your assessment task is done by someone else, it would be dishonest of you to claim it as your own



Seek Help

If you are not sure about how to cite or reference in essays, reports etc, then seek help from your lecturer, the library or the Academic Learning Centre (ALC)



Produce Original Work

Originality comes from your ability to read widely, think critically, and apply your gained knowledge to address a question or problem