UNSW Course Outline

ARCH2170 Building Information Modelling - 2024

Published on the 09 Feb 2024

General Course Information

Course Code : ARCH2170
Year : 2024
Term : Term 1
Teaching Period : T1
Is a multi-term course? : No
Faculty : Faculty of Arts, Design and Architecture
Academic Unit : School of Built Environment
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Building Information Modelling introduces concepts and methods of Building Information Modelling (BIM), its standards, and its application in design analysis. You will learn about BIM-based analysis of low carbon building design to achieve optimal design solutions. You will also learn BIM to evaluate building performance.

Course Aims

Relationship to Other Courses

ARCH1201 students have options to link to their studio project (i.e. a new terrace house at 96 Kent Street with private outside space such as balcony, garden and/or courtyard and/or roof terrace). This is optional for ARCH1201 students.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Explain Building Information Modelling (BIM) concepts, methods and standards for design analysis.
CLO2 : Apply skills in Building Information Modelling (BIM) for the design, documentation and visualisation of buildings.
CLO3 : Analyse low carbon design through Building Information Modelling (BIM).

Course Learning Outcomes	Assessment Item
CLO1 : Explain Building Information Modelling (BIM) concepts, methods and standards for design analysis.	• BIM for Conceptual Design and Energy Analysis • BIM for Detailed Design
CLO2 : Apply skills in Building Information Modelling (BIM) for the design, documentation and visualisation of buildings.	• BIM for Detailed Design
CLO3 : Analyse low carbon design through Building Information Modelling (BIM).	• BIM for Whole-Life Carbon Analysis • BIM for Conceptual Design and Energy Analysis

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

Teaching Strategies

This course enables students to develop digital modeling and analysis skills that will enhance professional practice in architecture, engineering and construction. There are three aspects to the teaching in this course:

Face-to-Face Classes: the course is structured around a weekly lecture and personal support

face-to-face at specific times in computer labs. ***Lectures*** will range in theme, but are designed to provide the necessary understanding of the key concepts and current and future trends in Building Information Modelling (BIM) in built environment disciplines. ***Computer lab tutorial classes*** will provide assistance about project work, etc. There is one online tutorial class only available for students who are overseas and whose applications have been approved by the School of Built Environment.

On-line Resources: Moodle is used in this course to provide learning resources and general course management.

Homework: students are required to complete a steady stream of work each week outside classes. A set of demonstration videos are available in Moodle to provide students with a self-directed guide.

The course has: Assignment 1 BIM for Conceptual Design and Energy Analysis, Assignment 2 BIM for Detailed Design, and Assignment 3 BIM for Whole Life Carbon Analysis.

Additional Course Information

Workload

Approx. 150 hours including class contact hours, weekly individual and group online learning activities, readings, class preparation, and assessment activities.

Learning Activity

Lecutre: 2 hours

Computer Lab Tutorial: 2 hours

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
BIM for Conceptual Design and Energy Analysis Assessment Format: Individual	30%	Start Date: 14/02/2024 12:00 AM Due Date: Week 3: 26 February - 03 March Post Date: 03/03/2024 11:30 PM
BIM for Detailed Design Assessment Format: Individual	40%	Start Date: 04/03/2024 12:00 AM Due Date: Week 8: 01 April - 07 April Post Date: 07/04/2024 11:30 PM
BIM for Whole-Life Carbon Analysis Assessment Format: Individual	30%	Start Date: 08/04/2024 12:00 AM Due Date: Week 11: 22 April - 28 April Post Date: 28/04/2024 11:30 PM

Assessment Details

BIM for Conceptual Design and Energy Analysis

Assessment Overview

You will create a BIM model of a conceptual building design and run an initial analysis of its operational energy use. Grading will be done against assessment criteria accompanied by written feedback.

Course Learning Outcomes

- CLO1 : Explain Building Information Modelling (BIM) concepts, methods and standards for design analysis.
- CLO3 : Analyse low carbon design through Building Information Modelling (BIM).

Detailed Assessment Description

Modification: The BIM for Conceptual Design and Energy Analysis Project will count a **20%** of total mark in the course

Assignment 1 (BIM for Conceptual Design and Energy Analysis) TOTAL 20%

Students are required to design and model a conceptual design of a terrace house in response to a given brief and run an initial analysis of the operational energy of the conceptual BIM model to inform design changes. Students will be given lectures and computer lab tutorials that will progressively guide students to complete the assignment 1 project.

The BIM for Conceptual Design and Energy Analysis Project will count a **20%** of total mark in the course. Detailed assignment 1 project brief is provided at Moodle course site.

Assessment Length

Refer to detailed assignment 1 project brief in Moodle

Submission notes

Refer to the detailed assignment project 1 brief in Moodle

Assessment information

Refer to the detailed assignment project 1 brief in Moodle

Assignment submission Turnitin type

This is not a Turnitin assignment

BIM for Detailed Design

Assessment Overview

You will develop your BIM model into a documentation set, including annotated 2D drawings and a rendered visualisation. Grading will be done against assessment criteria accompanied by written feedback.

Course Learning Outcomes

- CLO1 : Explain Building Information Modelling (BIM) concepts, methods and standards for design analysis.
- CLO2 : Apply skills in Building Information Modelling (BIM) for the design, documentation and visualisation of buildings.

Detailed Assessment Description

Assignment 2 (BIM for Detailed Design) TOTAL 40%

Students are required to further develop a detailed BIM model based on the assignment 1 project, including a set of 2D drawings extracted from the detailed BIM model and appropriately annotated and structured as a documentation set, a detailed wall section, and a rendered visualisation. Students will be given lectures and computer lab tutorials that will progressively guide students to complete the assignment 2 project.

The BIM for Detailed Design Project will count a 40% of total mark in the course. Detailed assignment 2 project brief will be provided at Moodle course site.

Assessment Length

A drawing set indicated in the detailed assignment 2 project brief in Moodle

Submission notes

Refer to the assignment 2 project brief in Moodle

Assessment information

Refer to the assignment 2 project brief in Moodle

Assignment submission Turnitin type

This is not a Turnitin assignment

BIM for Whole-Life Carbon Analysis

Assessment Overview

You will conduct a whole-life carbon analysis on your BIM model. Grading will be done against assessment criteria accompanied by written feedback.

Course Learning Outcomes

- CLO3 : Analyse low carbon design through Building Information Modelling (BIM).

Detailed Assessment Description

Modification: The BIM for Whole Life Carbon Analysis Project will count a **40%** of total mark in the course.

Assignment 3 (BIM for Whole Life Carbon Analysis) TOTAL 40%

Students are required to conduct a whole-life carbon analysis of the detailed BIM model completed in the assignment 2 project, including the embodied and operational carbon analysis. Students will be given lectures and computer lab tutorials that will progressively guide students to complete the assignment 3 project.

The BIM for Whole Life Carbon Analysis Project will count a 40% of total mark in the course. Detailed assignment 3 project brief will be provided at Moodle course site.

Assessment Length

Refer to the detailed assignment 3 project brief in Moodle

Submission notes

Refer to detailed assignment 3 project brief in Moodle

Assessment information

Refer to detailed assignment 3 project brief in Moodle

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

General Assessment Information

Refer to assessment criteria in the detailed assignment project briefs in Moodle.

Feedback Strategy

Students will gain information about their process in class via 3 basic levels.

Firstly, the goals of the class are clearly defined in the course outline and discussed at the beginning of each Assignment and the learning steps within the assignment are explained in the weekly lectures and tutorials. Here students will understand how their performance relates to the broad goals of the course.

Secondly, students will get feedback in each class (during the computer lab tutorial hours) upon their performance. Tutors will help students in one-to-one sessions to discuss and analyse how successful they have been at addressing the task and its criteria of each assignment and the learning steps within the assignment.

Thirdly, students will get structured written feedback in Moodle on their assignment work and how improvements could be made.

Grading Basis

Standard

Requirements to pass course

50% out of 100% (Total course mark)

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 5 February - 11 February	Other	Orientation Week
Week 1 : 12 February - 18 February	Lecture	BIM concepts, methods and processes. Introduction to the three assignment projects.
Week 2 : 19 February - 25 February	Lecture	Preliminary conceptual model of a terrace house and energy analysis. Introduction to energy analysis of design alternatives.
Week 3 : 26 February - 3 March	Lecture	Introduction to environmental rating systems, BIM-based tools for energy and carbon analysis, and benchmarks. Discussions and questions related to the assignment 1 project.
Week 4 : 4 March - 10 March	Lecture	Detailed BIM modelling using Revit. Model key building elements for the assignment 2 and BIM documentation. Introduction to Assignment 2 requirements. Introduction to drawing styles.
Week 5 : 11 March - 17 March	Lecture	BIM model auditing. BIM model audit methods and rule-based design check. Feedback on the assignment 1. Discussions and questions related to the assignment 2.
Week 6 : 18 March - 24 March	Other	Non-teaching week
Week 7 : 25 March - 31 March	Lecture	Concepts, methods and tools of parametric modelling. Discussions and questions related to parametric modelling.
Week 8 : 1 April - 7 April	Lecture	Revisit detailed BIM Model and BIM documentation for the assignment 2 submission. Introduction to assignment 3 requirements. Potential connection with the architectural studio project. BIM 360 for team collaboration.
Week 9 : 8 April - 14 April	Lecture	BIM-based whole-life carbon analysis including the embodied and operational carbon of buildings. BIM-based whole-life carbon analysis for the assingment 3, including: (1) embodied energy and carbon analysis, and (2) operational energy and carbon analysis including daylighting analysis.
Week 10 : 15 April - 21 April	Lecture	BIM in urban context. Integration of BIM and GIS for urban analysis. Feedback on the assignment 2. Discussions and questions related to the assignment 3.
Week 11 : 22 April - 28 April	Other	Submission of the assignment 3 project report.

Attendance Requirements

You are expected to be regular and punctual in attendance at all classes for the School of Built Environment courses in which you are enrolled. If and where individual courses have specific attendance requirements, these will be stated in the course outline.

If you do not attend, engage, or participate in scheduled class activities, including lectures, tutorials, studios, labs, etc, you run the risk of failing a course.

If illness or unexpected and beyond your control circumstances prevent you from completing a task on time, or substantially disturb your assessment performance, you should apply for Special Consideration, as soon as practicable, accompanied by appropriate documentation.

No special consideration will be provided if you miss out on essential course information and materials, or if you miss assessment tasks and deadlines due to unexplained absences or an unapproved lack of attendance.

You may be advised by the Course Convenor to withdraw from the course if significant learning activities are missed.

General Schedule Information

Besides the course schedule, the schedule for watching a set of tutorial videos is available in Moodle.

Course Resources

Prescribed Resources

A set of tutoial videos are available in Moodle.

Recommended Resources

Recommended reading materials are available in Moodle.

Additional Costs

N/A

Course Evaluation and Development

We encourage and support students to maintain regular contact with the course convenor to provide informal feedback throughout the course. For specific issues or detailed feedback, please arrange a meeting with the course convenor via email.

In this course there is an option for students to provide anonymous feedback via the course's Moodle page, which is directly sent to the convenor. As a final step, students are invited to share their insights and experiences by completing the MyExperience survey. The feedback gathered each year is integral to the continuous enhancement and development of the course.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Lan Ding		2021, Level 2, Anita B. Lawrence Centre	0413268584	By an appointment	Yes	Yes

Other Useful Information

Academic Information

Due to evolving advice by NSW Health, students must check for updated information regarding online learning for all Arts, Design and Architecture courses this term (via Moodle or course information provided).

Please see: https://www.unsw.edu.au/arts-design-architecture/student-life/resources-support/protocols-guidelines for essential student information relating to:

- UNSW and Faculty policies and procedures;
- Student Support Services;
- Dean's List;
- review of results;
- credit transfer;
- cross-institutional study and exchange;
- examination information;
- enrolment information;
- Special Consideration in the event of illness or misadventure;
- student equity and disability;

And other essential academic information.

Academic Honesty and Plagarism

Plagiarism is using the words or ideas of others and presenting them as your own. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement.

UNSW groups plagiarism into the following categories:

- Copying: Using the same or very similar words to the original text or idea without acknowledging the source or using quotation marks. This includes copying materials, ideas or concepts from a book, article, report or other written document, presentation, composition, artwork, design, drawing, circuitry, computer program or software, website, internet, other electronic resource, or another person's assignment without appropriate acknowledgement.
- Inappropriate paraphrasing: Changing a few words and phrases while mostly retaining the original information, structure and/or progression of ideas of the original without acknowledgement. This also applies in presentations where someone paraphrases another's ideas or words without credit and to piecing together quotes and paraphrases into a new whole, without appropriate referencing.

- Collusion: Working with others but passing off the work as a person's individual work. Collusion also includes providing your work to another student for the purpose of them plagiarising, paying another person to perform an academic task, stealing or acquiring another person's academic work and copying it, offering to complete another person's work or seeking payment for completing academic work.
- Inappropriate citation: Citing sources which have not been read, without acknowledging the "secondary" source from which knowledge of them has been obtained.
- Duplication ("self-plagiarism"): Submitting your own work, in whole or in part, where it has previously been prepared or submitted for another assessment or course at UNSW or another university.

The UNSW Academic Skills support offers resources and individual consultations. Students are also reminded that careful time management is an important part of study. One of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and proper referencing of sources in preparing all assessment items. UNSW Library has the ELISE tool available to assist you with your study at UNSW. ELISE is designed to introduce new students to studying at UNSW, but it can also be a great refresher during your study.

Completing the ELISE tutorial and quiz will enable you to:

- analyse topics, plan responses and organise research for academic writing and other assessment tasks
- effectively and efficiently find appropriate information sources and evaluate relevance to your needs
- use and manage information effectively to accomplish a specific purpose
- better manage your time
- understand your rights and responsibilities as a student at UNSW
- be aware of plagiarism, copyright, UNSW Student Code of Conduct and Acceptable Use of UNSW ICT Resources Policy
- be aware of the standards of behaviour expected of everyone in the UNSW community
- locate services and information about UNSW and UNSW Library

Use of AI for assessments

As AI applications continue to develop, and technology rapidly progresses around us, we remain committed to our values around academic integrity at UNSW. Where the use of AI tools, such as ChatGPT, has been permitted by your course convener, they must be properly credited and your submissions must be substantially your own work.

In cases where the use of AI has been prohibited, please respect this and be aware that where unauthorised use is detected, penalties will apply.

Use of AI for assessments | UNSW Current Students

Submission of Assessment Tasks

Turnitin Submission

If you encounter a problem when attempting to submit your assignment through Turnitin, please telephone External Support on 9385 3331 or email them on externalteltsupport@unsw.edu.au

Support hours are 8:00am – 10:00pm on weekdays and 9:00am – 5:00pm on weekends (365 days a year). If you are unable to submit your assignment due to a fault with Turnitin, you may apply for an extension, but you must retain your ticket number from External Support (along with any other relevant documents) to include as evidence to support your extension application. If you email External Support, you will automatically receive a ticket number, but if you telephone, you will need to specifically ask for one. Turnitin also provides updates on their system status on Twitter.

Generally, assessment tasks must be submitted electronically via either Turnitin or a Moodle assignment. In instances where this is not possible, alternative submission details will be stated on your course's Moodle site. For information on how to submit assignments online via Moodle: https://student.unsw.edu.au/how-submit-assignment-moodle

Late Submission Penalty

UNSW has a standard late submission penalty of:

- 5% per calendar day,
- for all assessments where a penalty applies,
- capped at five calendar days (120 hours) from the assessment deadline, after which a student cannot submit an assessment, and
- no permitted variation.

Students are expected to manage their time to meet deadlines and to request Special Consideration as early as possible before the deadline. Support with Time Management is available here.

School Contact Information

beadmin@unsw.edu.au