UNSW Course Outline

CODE1240 Computational Design 1 (Building) - 2024

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General Course Information

Course Code : CODE1240
Year : 2024
Term : Term 3
Teaching Period : T3
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

In this course, you will develop and apply fundamental skills in visual programming languages to critically analyse complex environmental conditions while synthesising computational design thinking knowledge and methods for solving building challenges. Theoretical knowledge will

cover morphology, algorithmic form, emergence, and systems. You will participate in weekly laboratory-based activities to experiment with and develop architectural forms (buildings). You will also develop your verbal and digital communication skills to demonstrate computational design ideas and results.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Apply fundamental visual programming skills to analyse complex environmental conditions.
CLO2 : Synthesise computational design thinking knowledge and methods for building challenges.
CLO3 : Communicate computational design ideas through scripts, environmental analysis and digital images.

Course Learning Outcomes	Assessment Item
CLO1 : Apply fundamental visual programming skills to analyse complex environmental conditions.	• Individual Project • Presentation Assessment
CLO2 : Synthesise computational design thinking knowledge and methods for building challenges.	• Individual Project • Presentation Assessment
CLO3 : Communicate computational design ideas through scripts, environmental analysis and digital images.	• Presentation Assessment

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Learning and Teaching in this course

This course will be taught in person. Lectures will be delivered in person combined with short prerecorded video-tutorials. Studios will involve preparation tasks, including watching of any prerecorded material prior to the class.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Individual Project Assessment Format: Individual	40%	Due Date: Week 5: 07 October - 13 October
Presentation Assessment Assessment Format: Individual	60%	Due Date: Week 11: 18 November - 24 November

Assessment Details

Individual Project

Assessment Overview

You will create buildings designed using computational design and environmental analysis. Marking will be done using a rubric with students receiving individual written feedback. Class-wide feedback will also be provided.

Course Learning Outcomes

- CLO1 : Apply fundamental visual programming skills to analyse complex environmental conditions.
- CLO2 : Synthesise computational design thinking knowledge and methods for building challenges.

Detailed Assessment Description

Refer to Moodle for further assessment details.

Assessment information

Refer to Moodle for more information on assessments.

Generative AI Permission Level

No Assistance

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

Presentation Assessment

Assessment Overview

You will develop a presentation that will demonstrate computational design and environmental analysis skills and knowledge. Marking will be done using a rubric with students receiving an individual mark. Verbal feedback will occur through the development of the projects both to individuals and broadly to the class.

Course Learning Outcomes

- CLO1 : Apply fundamental visual programming skills to analyse complex environmental conditions.
- CLO2 : Synthesise computational design thinking knowledge and methods for building challenges.
- CLO3 : Communicate computational design ideas through scripts, environmental analysis and digital images.

Detailed Assessment Description

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General Assessment Information

Refer to Moodle for more information on assessments.

Grading Basis

Standard

Requirements to pass course

Minimum of 50 points in total.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 2 September - 8 September	Homework	Data collection of the building.
Week 1 : 9 September - 15 September	Lecture	Introduction to the course.
	Presentation	Present your building in class.
	Activity	Think and Sketch the workflow to develop the overall shape of your builiding.
	Studio	Develop the overall shape or your building in Grasshopper.
Week 2 : 16 September - 22 September	Lecture	Parametric 3D Modelling I: Building Structures (primary and secondary elements).
	Activity	Think and Sketch the workflow to develop the structure of your building.
	Studio	Develop the structure of your building in Grasshopper.
Week 3 : 23 September - 29 September	Lecture	Parametric 3D Modelling II: Flooring and Roofing Systems.
	Activity	Think and Sketch the workflow to develop the flooring and roofing systems of your building.
	Studio	Develop the flooring and roofing systems of your building in Grasshopper.
Week 4 : 30 September - 6 October	Lecture	Parametric 3D Modelling III: Facade Systems.
	Activity	Think and Sketch the workflow to develop the facade of your building.
	Studio	Develop the facade of your building in Grasshopper.
Week 5 : 7 October - 13 October	Lecture	Environmental Analysis I: Simplified Model for Environmental Analysis. Terrain Modelling and Rain Simulation.
	Presentation	Presentations Assessment 1: Parametric 3D Model and Carbon Emissions Estimation.
	Assessment	Submission Assessment 1: Parametric 3D Model and Carbon Emissions Estimation.
	Homework	Develop the simplified model of your building for environmental analysis. Develop the terrain model and rain simulation for the specific location of your building.
Week 6 : 14 October - 20 October	Other	Flexibility Week
Week 7 : 21 October - 27 October	Lecture	Environmental Analysis II: Introduction to Ladybug Tools. Visualization of Environmental Data.
	Studio	Visualize the environmental data for the specific location of your building using Ladybug Tools.
Week 8 : 28 October - 3 November	Lecture	Environmental Analysis III: Sunlight Hours and Radiation Analysis.
	Studio	Perform sunlight hours and radiation analysis of your building for its specific location using Ladybug Tools.
Week 9 : 4 November - 10 November	Lecture	Environmental Analysis IV: Solar Panels for Electricity and Hot Water Supply.
	Studio	Estimate dimensions/area of solar panels in your building for electricity and hot water supply.
Week 10 : 11 November - 17 November	Lecture	Optimization Tools.
	Studio	Optimize the design of your building to maximize sunlight hours and maximize/minimize radiation. Optimize dimensions and location of solar panels on your building to maximize sunlight energy capture.
Week 11 : 18 November - 24 November	Presentation	Presentations Assessment 2: Environmental Analysis and Design Optimization.
	Assessment	Submission Assessment 2: Environmental Analysis and Design Optimization.

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

Course Resources

Prescribed Resources

Prescribed readings and online resources are provided in the weekly tabs on Moodle.

Recommended Resources

Recommended readings and online resources are provided in the weekly tabs on Moodle.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Cristina R amos Jaime		Anita B. Lawrence Centre (West Wing), Level 4, Room 4007		Email to organise a time	No	Yes

Other Useful Information

Academic Information

For essential student information relating to:

- UNSW and Faculty policies and procedures;
- Student Support Services;
- Student equity and disability;
- Special Consideration in the event of illness or misadventure;
- Examination information;
- Review of results;

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

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

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.

Important note: UNSW has a "fit to sit/submit" rule, which means that if you sit an exam or submit a piece of assessment, you are declaring yourself fit to do so and cannot later apply for Special Consideration. This is to ensure that if you feel unwell or are faced with significant circumstances beyond your control that affect your ability to study, you do not sit an examination or submit an assessment that does not reflect your best performance. Instead, you should apply for Special Consideration as soon as you realise you are not well enough or are otherwise unable to sit or submit an assessment.

School Contact Information

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