UNSW Course Outline

ARCH7809 Architectural Environment & Building Services - 2024

Published on the 23 Sep 2024

General Course Information

Course Code : ARCH7809
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 : Postgraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Architectural Environment & Building Services examines the performance of the indoor built

environment, its design and essential building services for ensuring comfort conditions. These services include heating, ventilation, air conditioning, lighting, fire safety, electric systems, renewables, and hydraulic systems. You will gain expertise in building envelope design and ventilation strategies to provide thermal comfort and minimise building energy needs. You will also develop skills enabling collaboration with building services engineers and other professionals. Through an understanding of the relationship between architectural space and building services, you will be able to make preliminary selections and integrate these services seamlessly into architectural designs.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Analyse the performance requirements and targets which are relevant to the indoor environment, leading to specifications for building services
CLO2 : Integrate basic building services in architectural design, in collaboration with other professionals
CLO3 : Design low energy buildings starting from the users' needs of comfort and indoor air quality, in compliance with the National Construction Code

Course Learning Outcomes	Assessment Item
CLO1 : Analyse the performance requirements and targets which are relevant to the indoor environment, leading to specifications for building services	• Building Services Integration • Building Services and Architectural Design • Building Envelope
CLO2 : Integrate basic building services in architectural design, in collaboration with other professionals	• Building Services Integration • Building Services and Architectural Design
CLO3 : Design low energy buildings starting from the users' needs of comfort and indoor air quality, in compliance with the National Construction Code	• Building Envelope

Learning and Teaching Technologies

Moodle - Learning Management System | Echo 360 | Zoom

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Building Services Integration Assessment Format: Group	30%	Start Date: Not Applicable Due Date: 27/09/2024 11:55 PM
Building Services and Architectural Design Assessment Format: Individual	30%	Start Date: Not Applicable Due Date: 25/10/2024 11:00 AM
Building Envelope Assessment Format: Individual	40%	Start Date: Not Applicable Due Date: 22/11/2024 11:55 PM

Assessment Details

Building Services Integration

Assessment Overview

In small groups, you will produce drawings of a specified building that demonstrate full integration and coordination of building services. Grading will be done against assessment criteria, accompanied by written feedback. Verbal feedback will also be provided in class. Individual contributions will be assessed.

Course Learning Outcomes

- CLO1 : Analyse the performance requirements and targets which are relevant to the indoor environment, leading to specifications for building services
- CLO2 : Integrate basic building services in architectural design, in collaboration with other professionals

Detailed Assessment Description

A1.1 (Individual, 20%) – Detailed integration in a commercial building of:

1. HVAC

2. Electric services, artificial lighting, & renewables

3. Fire services

4. Hydraulic services

Deliverable: typical floor plan, sections, elevations.

Students work individually on a single building service, on the same commercial building

developed by the whole group.

T1.2 – (Group, 10%) Integration and coordination between building services (demonstration of no interference)

Deliverable: typical floor plan, sections and elevations, and consolidated report.

Groups of 4 students.

Assessment Length

As per the assignment brief.

Assignment submission Turnitin type

This is not a Turnitin assignment

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
If your Convenor has concerns that your submission contains passages of AI-generated text or media, you may be asked to account for your work. If you are unable to satisfactorily demonstrate your understanding of your submission you may be referred to UNSW Conduct & Integrity Office for investigation for academic misconduct and possible penalties.
For more information on Generative AI and permitted use please see here.

Building Services and Architectural Design

Assessment Overview

You will perform a light building services integration on a design project, examine the impact of services on architecture, and prepare a hypothetical coordination meeting with building services specialists. Grading will be done against assessment criteria, accompanied by written feedback.

Course Learning Outcomes

- CLO1 : Analyse the performance requirements and targets which are relevant to the indoor environment, leading to specifications for building services
- CLO2 : Integrate basic building services in architectural design, in collaboration with other professionals

Detailed Assessment Description

A2.1 – Light building services integration = selection of building services and positioning of bulky items (e.g., air handling unit, lifts, switchboard). No details of the position of pipes & wires.

Deliverable: plans (all floors), sections, elevations.

A2.2 – Architectural impact of building services. Show the impact of building services on architecture (i.e., how the building looks like with the machines in). *Deliverable*: elevations, roof plan (interior if needed).

A2.3 – Coordination meeting preparation: a) prepare specific questions for the building services engineers, structural designer and consultants. This includes what you ask at early stages in design, etc.

b) Prepare discussion focusing on the resolution of potential conflicts between architecture, structure and services.

Deliverable: report.

Generative AI Permission Level

Simple Editing Assistance

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Building Envelope

Assessment Overview

You will extend on assessment 2 to produce an architectural layout that considers energy efficiency, thermal comfort and ventilation, visual comfort, thermal bridges, and acoustics Grading will be done against assessment criteria, accompanied by written feedback.

Course Learning Outcomes

- CLO1 : Analyse the performance requirements and targets which are relevant to the indoor environment, leading to specifications for building services
- CLO3 : Design low energy buildings starting from the users' needs of comfort and indoor air quality, in compliance with the National Construction Code

Detailed Assessment Description

A3 – Building envelope design for building energy efficiency:

- Architectural layout to minimize energy consumption
- Thermal comfort and ventilation
- Definition of openings and shading devices and visual comfort
- Management of thermal bridges
- Acoustic performance

Deliverable: plans, elevations, sections, building details, and short report.

Assignment submission Turnitin type

This is not a Turnitin assignment

Generative AI Permission Level

Simple Editing Assistance

In completing this assessment, you are permitted to use standard editing and referencing functions in the software you use to complete your assessment. These functions are described below. You must not use any functions that generate or paraphrase passages of text or other media, whether based on your own work or not.
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General Assessment Information

Grading Basis

Standard

Requirements to pass course

Achieve a composite mark of at least 50 out of 100.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 0 : 2 September - 8 September	Activity	• Read course outline • Read group organisation & building selection • Select building • Form groups of 4 students • Decide who within the group is working on what building service.
Week 1 : 9 September - 15 September	Lecture	Pre-recorded content. Watch before class. Lecture. L0. Introduction to the course and regulatory framework. On W1, you watch the lecture related to your selected building service (Fire, HVAC, Hydraulic, or Electrical). During the following weeks, you watch the other lectures. L1. Mechanical services (HVAC). L2. Electric systems and renewable energy. L3. Fire services and bushfire prevention. L4. Hydraulic services.
	Tutorial	Pre-recorded content. Watch before class. On W1, you watch the pre-recorded tutorial related to your selected building service (Fire, HVAC, Hydraulic, or Electrical). During the following weeks, you watch the other tutorials. T1. HVAC. T2. Renewables and electrical services integration, including sensors. T3. Fire services. T4. Hydraulic services. T5. Integration and coordination.
	Presentation	In-class. Summary of lectures 0 and course organisation. Presentation of Assignment 1 and Q&A.
	Workshop	Building services integration and coordination. In class (all groups together).
	Workshop	Thematic Tutorial Groups. Students always attend the same tutorial group from W1 to W3, depending on the building service that they work on. Content delivery and tutorial examples are pre-recorded. TG1. HVAC. TG2. Renewables and electrical services integration, including sensors. TG3. Fire services. TG4. Hydraulic services.
Week 2 : 16 September - 22 September	Lecture	Pre-recorded content. Watch before class. Watch the second of the building services lectures.
	Tutorial	Pre-recorded content. Watch before class. Watch the second tutorial (among Fire, HVAC, Hydraulic, or Electrical).
	Workshop	Workshop Building services integration and coordination. In class (all groups together).
	Workshop	Thematic Tutorial Groups. Students work on the assignment with their tutors. TG1. HVAC. TG2. Renewables and electrical services integration, including sensors. TG3. Fire services. TG4. Hydraulic services.
Week 3 : 23 September - 29 September	Lecture	Pre-recorded content. Watch before class. Watch the third lecture related to another building service (Fire, HVAC, Hydraulic, or Electrical).
	Tutorial	Pre-recorded content. Watch before class. Watch the third pre-recorded tutorial related to your another building service (Fire, HVAC, Hydraulic, or Electrical).
	Workshop	Building services integration and coordination. In class (all groups together).
	Workshop	You work in class with your tutor on the selected building service.
	Assessment	Assessment 1 (30%) is due on Friday 27/09/2024 at 23:55
Week 4 : 30 September - 6 October	Lecture	Pre-recorded content. Watch before class. Watch the fourth lecture, related to another building service (Fire, HVAC, Hydraulic, or Electrical).
	Tutorial	Pre-recorded content. Watch before class. Watch the fourth pre-recorded tutorial related to your another building service (Fire, HVAC, Hydraulic, or Electrical).
	Presentation	In-class Presentation of Assignment 2 + Q&A

		Summary of lectures 1-4.
	Workshop	You work in class with your tutors on Assignment 2.
Week 5 : 7 October - 13 October	Lecture	Pre-recorded content. Watch before class. Watch any lecture you haven't watched so far (Fire, HVAC, Hydraulic, or Electrical).
	Tutorial	Pre-recorded content. Watch before class. Watch any tutorial you haven't watched so far(Fire, HVAC, Hydraulic, or Electrical).
	Workshop	You work in class with your tutors on Assignment 2.
Week 6 : 14 October - 20 October	Other	Reading week. No lectures/tutorials. Online consultation via Zoom available (optional).
Week 7 : 21 October - 27 October	Assessment	Assignment 2 is due on Friday 25/10/2024 at 11:00 (11 am, before class)
	Lecture	Pre-recorded content. Watch before class. Lecture: one of the thematic lectures L5-L9. L5. Boundary conditions to building energy simulations – Outdoor and indoor climate. L6. Ventilation (natural and mechanical) and lighting (natural and artificial). Recalls and perspectives on thermal comfort. L7. Zero energy buildings and passive design strategies. Performance gap, uncertainty, and performance over time of building envelopes. L8. Building envelope performance: thermal bridges and materials. L9. Acoustics. Lecture: one of the thematic lectures L5-L9. L5. Boundary conditions to building energy simulations – Outdoor and indoor climate. L6. Ventilation (natural and mechanical) and lighting (natural and artificial). Recalls and perspectives on thermal comfort. L7. Zero energy buildings and passive design strategies. Performance gap, uncertainty, and performance over time of building envelopes. L8. Building envelope performance: thermal bridges and materials. L9. Acoustics.
	Tutorial	Pre-recorded content. Watch before class. Tutorial: one of the thematic tutorials T5-T8. Start from the topic you will address first in class. T5. Thermal comfort and ventilation T6. Visual comfort T7. Building envelope T8. Acoustics.
	Presentation	In-class Assignment 3 presentation + Q&A
	Workshop	You work with two tutors on your project.
Week 8 : 28 October - 3 November	Lecture	Pre-recorded content. Watch before class. Watch another of the lectures of the second part of the course (L5-L9).
	Tutorial	Pre-recorded content. Watch before class. Watch another of the thematic tutorials T5-T8.
	Presentation	In-class Summary of lectures 5-6 Q&A on Assignment 3
	Workshop	You work with two tutors on your project.
Week 9 : 4 November - 10 November	Lecture	Pre-recorded content. Watch before class. Watch another of the lectures of the second part of the course (L5-L9).
	Tutorial	Pre-recorded content. Watch before class. Watch another of the thematic tutorials T5-T8.
	Presentation	In-class Summary of lectures 7-9 Q&A on Assignment 3
	Workshop	You work with two tutors on your project.
Week 10 : 11 November - 17 November	Lecture	Pre-recorded content. Watch before class. Watch another of the lectures of the second part of the course (L5-L9).
	Tutorial	Pre-recorded content. Watch before class. Watch another of the thematic tutorials T5-T8.
	Presentation	In-class

		Course summary and final Q&A on Assignment 3
	Workshop	You work with two tutors on your project.
Week 11 : 18 November - 24 November	Assessment	Assignment 3 is due on Friday 22/11/2024 at 23:55
	Other	Optional feedback session (online)

Attendance Requirements

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

General Schedule Information

Lectures and tutorials introducing the assignment are pre-recorded.

Weekly, there will be a face-to-face session in the lecture theatre including:

- Presentation of the assignments and Q&A;

- Summary of lectures and discussion.

- Building services coordination tutorial (only for the first three weeks).

Face-to-face tutorial sessions will run weekly in the tutorial rooms.

Course Resources

Prescribed Resources

All resources are provided on Moodle. Essential resources are the National Construction Code (freely available at https://ncc.abcb.gov.au/) and the Pattern Book (linked on Moodle, freely available).

Recommended Resources

All provided on Moodle.

Additional Costs

No additional cost

Course Evaluation and Development

Online surveys will be regularly organised after the assignments to provide ongoing feedback, including questions on the assignment briefs. Questions during classes and tutorials are warmly encouraged. The following changes have been made based on students' feedback from the last

and previous years:

- The building services integration was moved to the first part of the course in 2020 (until 2019, it was in the second part of the course) and maintained there as it proved effective in expanding the focus on building services.
- The deadline for Assignment 1 was set on Week 3 to allow for 2 more weeks of consultations with building services engineers in Weeks 4 and 5.
- The assignment on building services integration (here A1) focuses only on commercial buildings to achieve parity in the level of complexity and, therefore, in grading.
- The grading guides and assignment briefs have been further improved.
- The duration of Q&A sessions has been reduced, and summaries of lectures (face to face) are now a regular feature.
- We removed the retrofit of a commercial building to residential use (trialled in 2023).

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	Riccardo Paolini		Rm 2025, Lv2, Anita B. Lawrence Centre, West Wing (H13)	02 9385 5627 | replaced by MS	By appointment – organise via email	Yes	Yes
Tutor	Nabeel Darwish		Fire Safety Services		W1-W5	No	No
	Matthew Leong		Mechanical Services (HVAC)		W1-W5	No	No
	Zoe Wu		Hydraulic Services		W1-W5	No	No
	Trevor McMaster		Electrical Services and Renewables		W1-W5	No	No
	Konstantina Vasilakopoulou		Daylighting and Visual Comfort		W7-W10	No	No
	Gloria Pignatta		Acoustics		W7-W10	No	No
	Arosha Gamage		Thermal Comfort and Ventilation		W7-W10	No	No

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

beadmin@unsw.edu.au