UNSW Course Outline

DESN2000 Engineering Design and Professional Practice (BINF) - 2024

Published on the 15 May 2024

General Course Information

Course Code : DESN2000
Year : 2024
Term : Term 2
Teaching Period : T2
Is a multi-term course? : No
Faculty : Faculty of Engineering
Academic Unit : Faculty of Engineering
Delivery Mode : In Person
Delivery Format : Standard
Delivery Location : Kensington
Campus : Sydney
Study Level : Postgraduate, Undergraduate
Units of Credit : 6

Useful Links

Handbook Class Timetable

Course Details & Outcomes

Course Description

Design is one of the critical foundations of engineering and a main component in creating value. A good engineer has complex technical skills, but also creative skills, project management and teamworking skills, and knowledge of professional ethical standards in design.

DESN2000 aims to further develop your skills in engineering design with a particular focus on the early stages, where innovative concepts are created in response to open-ended problems. These skills will be developed in the context of an engineering project, with a focus on three areas: (1) research techniques needed to understand design problems and discover concepts, (2) technical skills needed to build a concept, and (3) evaluation methods for evaluating the concept. Alongside the development of design skills, the course also aims to develop your readiness for professional practice by deepening your understanding and skills in effective project management, teamwork and communication.

The course builds on the teamwork, communication, and project management skills introduced in DESN1000. Skills learned in DESN2000 are further deepened in DESN3000, which will develop skills for managing design in commercial context.

With DESN1000 and DESN3000, DESN2000 provides design skills described in Engineers Australia's Stage 1 Competencies, especially competencies 1.3, 1.5, 1.6; 2., 2.3; and 3.2 and 3.6.

Students who require DESN2000 should enrol in a specific term according to their Engineering Specialisation:

Term 2:
Students with specialisations offered by the School of Electrical Engineering and Telecommunications
Students with specialisations offered by the School of Civil and Environmental Engineering
Students with specialisations offered by the School of Computer Science and Engineering
Students with specialisations offered by the School of Minerals and Energy Resources Engineering

Term 3:
Students with specialisations offered by the School of Mechanical and Manufacturing Engineering
Students with specialisations offered by the School of Photovoltaic and Renewable Energy Engineering
Students with specialisations offered by the School of Chemical Engineering
Students with specialisations offered by the School of Minerals and Energy Resources Engineering

Prerequisite Conditions:

1. School of Mechanical and Manufacturing Engineering: (DESN1000 or DPST1071) and MMAN1130 and enrolled in an MME streams (AEROAH, MECHAH, MANFAH, MTRNAH)
2. School of Electrical Engineering and Telecommunications: (DESN1000 or DPST1071) and ELEC2141 and (COMP1511 or COMP1521)
3. School of Chemical Engineering: (DESN1000 or DPST1071) and CEIC2000 and (CHEM1821 or CHEM1021 or CHEM1041)
4. School of Civil and Environmental Engineering: (DESN1000 or DPST1071) and enrolled in a Civil & Environmental Engineering streams (CVENAH, CVENBH, GMATDH)
5. School of Photovoltaic and Renewable Energy Engineering: (DESN1000 or DPST1071) and SOLA 2051
6. School of Computer Science and Engineering: (COMPBH and COMP1521 and (DESN1000 or DPST1071)) or (SENGAH/BINFAH and COMP 2521 and (DESN1000 or DPST1071))
7. School of Minerals and Energy Resources Engineering: (MINEAH and (DESN1000 or DPST1071)) or (PETRAH and CEIC2001 and (DESN1000 or DPST1071))

Course Aims

DESN2000 aims to further develop your skills in engineering design with a particular focus on the early stages, where innovative concepts are created in response to open-ended problems. These skills will be developed in the context of an engineering project, with a focus on three areas: (1) research techniques needed to understand design problems and discover concepts, (2) technical skills needed to build a concept, and (3) evaluation methods for evaluating the concept. Alongside the development of design skills, the course also aims to develop your readiness for professional practice by deepening your understanding and skills in effective project management, teamwork and communication.

Relationship to Other Courses

This is a core component for students following the 3707 Engineering (Honours) Bioinformatics Engineering program.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Develop design concepts using standard methods to collect, assess and integrate end-user, stakeholder and project requirements.
CLO2 : Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts.
CLO3 : Implement disciplinary technical theory and skills pertinent to the design project.
CLO4 : Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools.
CLO5 : Integrate project management techniques to plan, execute and complete an open-ended design project.
CLO6 : Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication.

Course Learning Outcomes	Assessment Item
CLO1 : Develop design concepts using standard methods to collect, assess and integrate end-user, stakeholder and project requirements.	• Design Journal • Design Presentation
CLO2 : Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts.	• School Assessments • Design Journal • Design Presentation
CLO3 : Implement disciplinary technical theory and skills pertinent to the design project.	• School Assessments • Design Presentation
CLO4 : Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools.	• School Assessments • Design Journal • Design Presentation
CLO5 : Integrate project management techniques to plan, execute and complete an open-ended design project.	• School Assessments • Design Journal
CLO6 : Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication.	• School Assessments • Design Journal • Design Presentation

Learning and Teaching Technologies

Moodle - Learning Management System | Microsoft Teams

Learning and Teaching in this course

The primary teaching vehicle of the course is an industry-led bioinformatics software

engineering project in which students learn to apply scientific, engineering, and user-centred knowledge to a design problem. Details of this project are provided in a separate Project Brief.

Students will complete both individual and group work. For each hour of contact it is expected that you will put in at least 1.5 hours of private study. It is expected that groups meet outside of the scheduled times and progress their group project independently.

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
School Assessments Assessment Format: Individual	60%	Start Date: Not Applicable Due Date: Week 3: 10 June - 16 June, Week 5: 24 June - 30 June, Week 7: 08 July - 14 July, Week 8: 15 July - 21 July, Week 10: 29 July - 04 August, Week 11: 05 August - 11 August
Design Journal Assessment Format: Individual	20%	Start Date: Not Applicable Due Date: Week 7: 08 July - 14 July
Design Presentation Assessment Format: Group	20%	Due Date: Week 10: 29 July - 04 August

Assessment Details

School Assessments

Assessment Overview

Each student is required to complete their school-specific assessment, comprised of three sub-tasks. For each sub-task, assessment criteria are related to the school's project and discipline, covering areas of design creation and evaluation, technical knowledge, project management and communication.

Course Learning Outcomes

- CLO2 : Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts.
- CLO3 : Implement disciplinary technical theory and skills pertinent to the design project.
- CLO4 : Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools.
- CLO5 : Integrate project management techniques to plan, execute and complete an open-ended design project.
- CLO6 : Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication.

Detailed Assessment Description

Project background presentation 5% LIVE PRESENTATION (**Week 3**) - group

Project plan document 10% 11:59 PM, MONDAY (**Week 7**) - group

Final product 30% 11:59 PM, MONDAY (**Week 11**) - individual

Product documentation 5% 11:59 PM, MONDAY (**Week 11**) - group

Sprint reviews and project management 10% Ongoing (SPRINT 1 **Week 5**, SPRINT 2 **Week 8**) - individual

Assignment submission Turnitin type

Not Applicable

Design Journal

Assessment Overview

Students individually keep an active, professional record and reflection of their team's design process, which is reviewed regularly by mentors. Assessment criteria include design process, project management, teamwork and communication.

Course Learning Outcomes

- CLO1 : Develop design concepts using standard methods to collect, assess and integrate end-user, stakeholder and project requirements.
- CLO2 : Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts.
- CLO4 : Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools.
- CLO5 : Integrate project management techniques to plan, execute and complete an open-ended design project.
- CLO6 : Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication.

Design Presentation

Assessment Overview

Student teams give a presentation that pitches their final design solution, including its unique value. Assessment criteria will address the problem-solution, technical validation and communication.

Course Learning Outcomes

- CLO1 : Develop design concepts using standard methods to collect, assess and integrate end-user, stakeholder and project requirements.
- CLO2 : Validate the suitability of designs using standard technical methods while considering end-user and stakeholder contexts.
- CLO3 : Implement disciplinary technical theory and skills pertinent to the design project.
- CLO4 : Contribute to the work of a team and collaborate on the design project, including the implementation of organisational and interpersonal tools.
- CLO6 : Explain designs to various audiences using oral, written, and visual forms of professional and persuasive communication.

General Assessment Information

Grading Basis

Standard

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Introduction to concept design
	Workshop	Design Sprint
	Lecture	Introduction to the project/agile project management
	Workshop	Project Groups First brainstorms
Week 2 : 3 June - 9 June	Lecture	Research and analysis
	Workshop	Planning user research and analysis
	Lecture	Requirements Elicitation and Validation
	Workshop	Personas and Scenarios Project Work
Week 3 : 10 June - 16 June	Lecture	Pitching Guest lecture
	Workshop	Problem statement and concept generation
	Workshop	Project presentation: project background and goals User Stories and Acceptance Criteria and Testing
	Lecture	PUBLIC HOLIDAY (No Lectures)
	Assessment	Project requirements presentation
Week 4 : 17 June - 23 June	Workshop	Planning user testing
	Lecture	Prototyping Methods and Tools
	Workshop	Mapping your user stories Project Work
Week 5 : 24 June - 30 June	Workshop	Storytelling by pitching
	Lecture	UX/UI and interface design principles
	Workshop	Sprint review 1 Prototyping
Week 7 : 8 July - 14 July	Lecture	Visual Design and Hierarchy
	Workshop	Visual Design Exercises Project Work
	Assessment	Preliminary report
	Assessment	Design journal
Week 8 : 15 July - 21 July	Lecture	Accessibility and Ethics of Design
	Workshop	Sprint review 2 Accessibility
Week 9 : 22 July - 28 July	Lecture	Data Collection and Usability Testing Methods
	Workshop	Usability Testing Project Work
Week 10 : 29 July - 4 August	Lecture	Ethics of data
	Workshop	Final product demos
	Assessment	Design Presentation. Live Pitching Session
Week 11 : 5 August - 11 August	Assessment	Final product with documentation

Attendance Requirements

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

General Schedule Information

BINF/SENG Lecture: Monday 9AM - 12PM

Design Lecture : Tuesday 1PM - 2PM

Design Workshops: Wednesday 11AM - 1PM

BINF Workshop: Friday 2PM - 4PM

Course Resources

Recommended Resources

- van Roeijen, Annemiek et al. 2015. Delft Design Guide. BIS Publisher, Amsterdam. Second edition.
- Preece (2019), 5th ed., Interaction Design: Beyond Human-Computer Interaction. John Wiley & Sons
- Reinders, Angèle et al. 2012, The Power of Design: Product Innovation in Sustainable Energy Technologies, Chichester, West Sussex, U.K. : John Wiley & Sons.
- Siegel, Neil G. 2019, Engineering project management, Hoboken, NJ, USA, John Wiley and Sons, Incorporated.

Course Evaluation and Development

This course is under constant revision in order to improve the learning outcomes for all students. Please forward any feedback (positive or negative) on the course to the course convener or via the online student survey myExperience. You can also provide feedback to your student society who will raise your concerns at student focus group meetings. As a result of previous feedback obtained for this course and in our efforts to provide a rich and meaningful learning experience, we have continued to evaluate and modify our delivery and assessment methods including updated lecture notes, workshops, blended learning resources, in-class demonstrations, and industry guest lectures.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
	Sara Ballouz					No	No
	Ilpo Koskinen					No	Yes

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's Special Consideration page.

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- Attendance
- UNSW Email Address
- Special Consideration
- Exams
- Approved Calculators
- Academic Honesty and Plagiarism
- Equitable Learning Services

III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: https://www.unsw.edu.au/engineering/student-life/student-resources/program-design.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: student.unsw.edu.au/plagiarism. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

Engineering Student Support Services – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

Engineering Industrial Training – Industrial training questions

UNSW Study Abroad – study abroad student enquiries (for inbound students)

UNSW Exchange – student exchange enquiries (for inbound students)

UNSW Future Students – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)