Course Outline

Term 2, 2020

DESN2000-SENG Engineering Design and Professional Practice

COURSE DETAILS

Units of Credit	**6**
Contact hours	6-7 per week

DESN2000 uses Microsoft Teams as the portal for remote teaching and learning. It will be used for file sharing, virtual classrooms, announcements and other communications. You are expected to check the platform regularly. In the first instance, you are encouraged to ask questions after lectures. Otherwise course discussions and questions take place in *Posts* on MS Teams. Your demonstrators and academic staff will actively monitor these posts. Please use replies and keep discussions in appropriate channels. If required, emails must be made from your student email address with DESN2000 in the subject line.

Your class times will often vary week to week. Please check your myUNSW timetable for your class times each week.

Course Coordinator and Lecturer	Ilpo Koskinen ilpo.koskinen@unsw.edu.au Design Next, Kens J17 Lv5 Rm503
School Coordinator and Lecturer	Sasha Vassar a.vassar@unsw.edu.au
Lecturer	Doménique van Gennip d.vangennip@unsw.edu.au Design Next, Kens J17 Lv5 Rm503
Lecturer	Nicholas Gilmore nicholas.gilmore@unsw.edu.au Design Next, Kens J17 Lv5 Rm503
Demonstrators	Hayden Smith F09; F15 Maliha Mian F12; Thu15 Clifford Sesal F12; Thu15 Stephanie Kan F15

INFORMATION ABOUT THE COURSE

Prerequisites and assumed knowledge

The pre-requisites for this course is ENGG1000 (Engineering Design & Innovation) and COMP1521 (Computer Systems Fundamentals). Students should have a good understanding of basic programming and basic computer architecture. The course shares substantial content with COMP2121 (Microprocessors and Interfacing). You cannot take this course after completing COMP2121.

Relationship to other CSE courses

This is a 2nd year course in the School of Computer Science Engineering. It is a core subject for students following a BE (COMP) and (SENG) program.

HANDBOOK DESCRIPTION

See link to virtual handbook*:*

https://www.handbook.unsw.edu.au/undergraduate/courses/2020/DESN2000

OBJECTIVES

This course develops basic conceptual design skills you need in software engineering. The course teaches two types of design skills. Generic design skills include models of design process, economic and practical reasoning behind concept design, research and concept creation techniques in design, evaluation techniques in design, as well as communication, project management, and teamwork techniques.

The course also develops discipline-specific skills. For Software Engineering students, this course has the following objectives:

- Develop a basic understanding of project management, specifically in the software engineering field, including methods of estimation and scheduling.
- Develop an understanding of the process for requirements elicitation, analysis and validation in a software engineering context.
- Understand a number of software engineering process models and benefits of each one. Be able to justify the choice of the most applicable process model to your project.
- Develop the knowledge that allows you to model your system (for example, using UML).
- Understand the role of UX design in front end development.
- Understand the role of testing in software engineering, including unit, UX and system testing.
- Develop a front-end prototype (using React JS) to test your project concepts

TEACHING STRATEGIES

Students will complete both individual and group work.

All class materials for 2020 T2 will be delivered online via MS Teams. This includes the project brief, lecture notes, lab guides, workshop guides and assessment guides.

Team: *DESN2000 SENG – 2020 T2* > **Channel:** *General* > **Tab:** *Files*

MS Teams, Blackboard Collaborate Ultra and/or Zoom may be used for lecture recordings and virtual classrooms. These will be accessed via MS Teams. Links are posted well in advance of scheduled times.

Lectures

You are expected to attend all lectures. These provide the backbone for your practical work in tutorials and workshops.

Tutorials

Weekly tutorials are the primary means through which students work through projects and associated exercises aimed at developing understanding of the course materials. Demonstrators are available to provide guidance and support teams in their project development.

Workshops

Workshops will focus on concept design and pitching. In Term 2 in 2020 the workshops will be delivered remotely via Blackboard Collaborate Ultra or Zoom, using “break-out” sessions it provides. You will find links to these sessions on your private class channel in MS Teams in due course. Workshop guides for these classes are available in MS Teams.

EXPECTED LEARNING OUTCOMES

After successfully completing this course, you should be able to:

#	Learning outcome description	EA stage 1 Competencies
1	Design creation: prepare design concepts using standard methods to collect, analyse and model user stakeholder and requirements.	1.5, 2.1, 2.3.
2	Design evaluation: verify and validate the suitability of design concepts using standard technical, economic, risk, ethical and sustainability assessments	1.5, 1.6
3	Technical knowledge: identify and acquire the technical knowledge & skills identified as necessary from the design requirements	1.3
4	Teamwork: demonstrate the characteristics of effective teamwork and professional conduct and apply organisational and interpersonal strategies	3.6
5	Project management: employ project management techniques to plan, execute and complete a design project	2.4
6	Communication: explain designs using oral, written and visual forms of professional communication to various audiences	3.2

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage 1 Competency Standards may be found in Appendix A.

For each hour of contact it is expected that you will put in at least 1.5 hours of private study.

COURSE PROGRAM

Class Topics

Date	Lecture	Tutorial	Workshop
Week 1 01/06/2020	Ilpo Koskinen (1h) *Course introduction and the basics of concept design* Sasha Vassar (1h) *Introduction and Project Intro* Sasha Vassar (2h) *Project Management – group dynamics, and management, cost estimates, time estimates*	Demonstrator (2h) *Project Management Basics*	
Week 2 08/06/2020	Sasha Vassar (1h) *Requirements elicitation* Ilpo Koskinen (1h) *Research for concept design* Sasha Vassar (2h) *Requirements analysis and validation*	Demonstrator (2h) *Personas and User Stories*	Demonstrator (1h) *Research plan*
Week 3 15/06/2020	Sasha Vassar (1h) *Configuration Management* Ilpo Koskinen (1h) *Process for concept design* Sasha Vassar (2h) *Process Models*	Demonstrator (2h) *Project Work*	Demonstrator (1h) *Ideation*
Week 4 22/06/2020	Sasha Vassar (2h) *Modelling and Architecture* *System Modelling* Sasha Vassar (2h) *UX Design*	Demonstrator (1h) *Requirements Engineering*	Demonstrator (1h) *Developing concepts*

Date	Lecture	Tutorial	Workshop
Week 5 29/06/2020	Sasha Vassar (2h) *System Testing* Sasha Vassar (2h) *UX Testing*	Demonstrator (1h) *System Modelling*	Demonstrator (1h) *Storytelling*
Week 6* 06/07/2020			
Week 7 13/07/2020	Hayden Smith (2h) *Front end development - react* Hayden Smith (2h) *Front end development - react*	Demonstrator (3h) *UX Design* *React*	
Week 8 20/07/2020	Hayden Smith (1h) *Front end development - react* Shahe Momdijan (1h) *Guest Lecture: Pitching* Hayden Smith (2h) *Front end development - react*	Demonstrator (2h) *React*	Demonstrator (1h) *Pitching*
Week 9 27/07/2020	Hayden Smith (2h) *Front end development - react* Sasha Vassar (2h) *Case Study*	Demonstrator (1h) *React*	Demonstrator (1h) *Pitch assessment practice*
Week 10 03/08/2020	Sasha Vassar (2h) *Case Study* Sasha Vassar (2h) *Bringing it all together*	Demonstrator (2h) *Project Work*	

** Flexibility week for all courses. No new content or assignment submissions.*

Class Schedule

Please check your myUNSW timetable for your individual timetable information, and for any announcements on Microsoft Teams.

Week 1	Week 2	Week 3	Week 4	Week 5	Revision	Week 7	Week 8	Week 9	Week 10
Lecture Mon. 17-18	**Lecture** Wed 11-12	**Lecture** Wed 11-12	**Lecture** Wed 11-13	**Lecture** Wed 11-13	**Tutorial** Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17	**Lecture** Wed 11-13	**Lecture** Wed 11-12	**Lecture** Wed 11-13	**Lecture** Wed 11-13
Lecture Wed. 11-12	**Lecture** Wed 12-13	**Lecture** Wed 12-13					**Lecture** Wed 12-13		
Lecture Thur. 12-14	**Lecture** Thur. 12-14	**Lecture** Thur. 12-14	**Lecture** Thur. 12-14	**Lecture** Thur. 12-14		**Lecture** Thur. 12-14	**Lecture** Thur. 12-14	**Lecture** Thur. 12-14	**Lecture** Thur. 12-14
Tutorial Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17	**Tutorial** Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17	**Tutorial** Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17	**Tutorial** Fri. 9-10, Fri. 12-13, Fri 15-16, Thur. 15-16 **Workshop** Fri. 10-11 Fri. 13-14, Fri 16-17, Thur. 16-17	**Tutorial** Fri. 9-10, Fri. 12-13, Fri 15-16, Thur. 15-16 **Workshop** Fri. 10-11 Fri. 13-14, Fri 16-17, Thur. 16-17		**Tutorial** Fri. 9-12, Fri. 12-15, Fri 15-18, Thur. 15-18	**Tutorial** Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17	**Tutorial** Fri. 9-10, Fri. 12-13, Fri 15-16, Thur. 15-16 **Workshop** Fri. 10-11 Fri. 13-14, Fri 16-17, Thur. 16-17	**Tutorial** Fri. 9-11, Fri. 12-14, Fri 15-17, Thur. 15-17
	Workshop Fri. 11-12, Fri. 14-15, Fri 17-18, Thur. 17-18	**Workshop** Fri. 11-12, Fri. 14-15, Fri 17-18, Thur. 17-18					**Workshop** Fri. 11-12, Fri. 14-15, Fri 17-18, Thur. 17-18		

ASSESSMENTS

Assessment Outline

Item	Weighting	Learning outcomes	Assessment criteria	Due date by
Design Journal				
Mid-term	12.5 %	1-6	Refer to assessment guide	Midnight, Friday 3 July (Week 5)
End-term	12.5 %	1-6	Refer to assessment guide	Midnight, Friday 7 August (Week 10)
Pitch	10 %	1-6	Refer to assessment guide	Midnight, Friday 31 July (Week 9)
Peer Review	5 %	4-6	Refer to assessment guide	Midnight, Friday 7 August (Week 10)
Technical Presentation	15 %	1-6	Includes a presentation and documents with software requirements and specifications. Refer to assessment guide for details.	Midnight, Friday 3 July (Week 5)
Preliminary Report	15 %	1-6	Includes software design specification and a preliminary prototype. Refer to assessment guide for details.	Midnight, Friday 17 July (Week 7)
Final Report	30 %	1-6	Includes a final software requirements specification, testing report and a final prototype. Refer to assessment guide for details.	Midnight, Friday 14 August (Week 11)

Details for each assessment are presented in separate assessment guides for each task.

Individual contribution to group assessments will be evaluated via peer review for each submission, as well as a separate peer review at the end of the term.

Marks will be returned within 2 weeks of the submission due date.

PENALTIES

Late work will be penalised at the rate of 10% per day after the due time and date have expired.

RELEVANT RESOURCES

- van Roeijen, Annemiek et al. 2015. *Delft Design Guide.* BIS Publisher, Amsterdam. Second edition.
- Pressman, R. S., Maxim, B.R., 9th Edition (2020). *Software engineering: a practitioner's approach*. McGraw Hill.

Other Useful Resources:

- Patton, J, Economy, P. (2014). *User Story Mapping: Discover the Whole Story, Build the Right Product*. O'Reilly Media Inc.
- Preece (2019), 5th ed., *Interaction Design: Beyond Human-Computer Interaction*. John Wiley & Sons

Online resources:

Microsoft Teams will be used to disseminate teaching materials. Assessment marks will also be made available via Moodle: https://moodle.telt.unsw.edu.au/login/index.php.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at: https://student.unsw.edu.au/dates

PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person's work or ideas as if they were your own. When it is necessary or desirable to use other people's material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at: https://student.unsw.edu.au/plagiarism

WORKLOAD & ATTENDANCE

It is expected that you will spend at least **15 hours per** week studying a 6 UoC course, from Week 1 until the final assessment, including both face-to-face classes and independent, self-directed study. In periods where you need to complete assignments or prepare for examinations, the workload may be greater. Over-commitment has been a common source of failure for many

students. You should take the required workload into account when planning how to balance study with employment and other activities.

Regular and punctual attendance at all classes is expected. UNSW regulations state that if students attend less than 80% of scheduled classes they may be refused final assessment.

GENERAL CONDUCT & BEHAVIOUR

Consideration and respect for the needs of your fellow students and teaching staff is an expectation. Conduct which unduly disrupts or interferes with a class is not acceptable and students may be asked to leave the class.

WORK HEALTH & SAFETY

UNSW policy requires each person to work safely and responsibly, in order to avoid personal injury and to protect the safety of others.

SPECIAL CONSIDERATION & SUPPLEMENTARY EXAMINATION

You must submit all assignments and attend all examinations scheduled for your course. You can apply for special consideration when illness or other circumstances beyond your control interfere with an assessment performance. If you need to submit an application for special consideration for an exam or assessment, you must submit the application **prior to the start** of the exam or before the assessment is submitted, except where illness or misadventure prevent you from doing so. Be aware of the "fit to sit/submit" rule which means that if you sit an exam or submit an assignment, you are declaring yourself well enough to do so and cannot later apply for Special Consideration. For more information and how to apply, see https://student.unsw.edu.au/special-consideration.

COURSE IMPROVEMENT

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.

ADMINISTRATIVE MATTERS

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

- Special Considerations: student.unsw.edu.au/special-consideration;
- Exams: https://student.unsw.edu.au/exams
- Approved Calculators: https://student.unsw.edu.au/exam-approved-calculators-and-computers
- Academic Honesty and Plagiarism: https://student.unsw.edu.au/plagiarism
- Equitable Learning Services: https://student.unsw.edu.au/els

- General and Program-specific questions: The Nucleus: Student Hub
- Others: https://student.unsw.edu.au/support

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	Program Intended Learning Outcomes
PE1: Knowledge and Skill Base	PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals
	PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing
	PE1.3 In-depth understanding of specialist bodies of knowledge
	PE1.4 Discernment of knowledge development and research directions
	PE1.5 Knowledge of engineering design practice
	PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability	PE2.1 Application of established engineering methods to complex problem solving
	PE2.2 Fluent application of engineering techniques, tools and resources
	PE2.3 Application of systematic engineering synthesis and design processes
	PE2.4 Application of systematic approaches to the conduct and management of engineering projects
PE3: Professional and Personal Attributes	PE3.1 Ethical conduct and professional accountability
	PE3.2 Effective oral and written communication (professional and lay domains)
	PE3.3 Creative, innovative and pro-active demeanour
	PE3.4 Professional use and management of information
	PE3.5 Orderly management of self, and professional conduct
	PE3.6 Effective team membership and team leadership