

Course Staff

Course Convener: Dr. Hadis Nosrati, h.nosrati@unsw.edu.au
 Laboratory Contact: TBC

Consultations: You are encouraged to ask questions during the lecture/laboratory time in the first instance rather than via email. You are also welcome to email the lecturer, who can provide you with consultation times.

Keeping Informed: Announcements concerning course information will be given in the laboratories and/or on Moodle <https://moodle.telt.unsw.edu.au/login/index.php>.

Course Summary

Contact Hours

The course consists of 3 hours of lecture/laboratory.

Lectures/Labs	Day	Time	Location
	Tuesday	2pm – 5pm	ElecEng101-102/ElecEng 125
Open Labs	Thursday	5pm - 8pm	ElecEng101-102

Context and Aims

Although the theoretical skills that students acquire during their time at university form a strong foundation for their future career, companies have naturally been placing particular emphasis on the design skills of our graduates. The goal of this postgraduate course is to allow the students to demonstrate their ability to integrate the knowledge and concepts they have acquired so far and apply them to carry out practical design. In addition to assessing their design skills, this course gives the students the opportunity to identify and improve, with the help of the teaching staff, their design skills in individual streams being examined.

The aims of the course are to:

- Provide students with practical design experience.
- Ensure the students' design skills are adequate and to the level desirable for a professional Engineer.
- Give the students the opportunity to improve their design skill base and engineering practice skills required by professional engineers.

Indicative Lecture Schedule

NOTE: The following is a tentative schedule and the order of labs may change. Also, the Laboratory Design Exam and the Catch-up design may swap in weeks 11 and 13.

Period	Summary of Lecture Program
Week	Design content
1-3	Analogue and digital circuit design
4	Familiarisation with data acquisition device and MATLAB environment.

5-7	Telecommunication/Power system
Break	
8-10	Signal Processing + Control Systems
11	Laboratory Design Exam
12-13	Catch-up or repeat design

Assessment

The assessment consists solely of the lab and there is **no final examination**. Each of the three labs is worth 25% and a pass mark (12.5%) must be obtained for each of them for the student to pass the subject. A student is allowed to fail only one lab in the regular part of the course. In this case, the student will get a chance to undertake a supplementary lab in the last week of the semester (weeks 12-13). If the student then performs satisfactorily, that student will get a mark of 12.5%. Therefore, for the failed lab, the student's maximum attainable mark reduces by 12.5%. Students who have passed all of their labs may retake one lab if it can be justified that this will enhance their learning.

Laboratory Practical Experiments	75%
Lab Exam	25%

Course Details

Credits

The course is a 6 UoC course; expected workload is 10–12 hours per week throughout the semester.

Pre-requisites and Assumed Knowledge

This is a postgraduate course that draws on knowledge and practical skills gained in your undergraduate degree. This course does not focus on teaching the design process itself, nor the basic theories and concepts of any of the streams. Instead, the combination of the students' theoretical knowledge and design skills in these areas will be assessed. Consequently, this course is quite significant in preparing the student for the step from university life to the professional environment.

Learning outcomes

At the end of the course students should:

- Have shown their capacity to successfully harness their technical knowledge to carry out meaningful design tasks in each of the competency streams.
- Have identified and improved any issues related to their knowledge base.
- Be able to identify the design requirements and the relevant concepts and resources in order to successfully reach the design goals.
- Have the ability to combine various streams of electrical engineering to develop a solution to a design problem.

The course delivery methods and course content address a number of core UNSW *graduate attributes*; these include:

- The capacity for analytical and critical thinking and for creative problem solving.
- The ability to engage in independent and reflective learning.
- Information Literacy – the skills to locate evaluate and use relevant information.
- The capacity for enterprise, initiative and creativity.

- The skills of effective communication.

Syllabus

This course consists of design tasks in the areas of analogue and digital circuits, digital signal processing, control systems, and one of telecommunications/power system.

Teaching Strategies

Delivery Mode

The laboratories will form the primary method of instruction for this course. The students are expected to prepare for each of the design lab sessions prior to arriving at the laboratory. During the lab session, they will be guided and supported by the lab demonstrators. However, as this is an assessment exercise, the staff will provide careful guidance such that the fundamental contribution to the design task remains that of the student. Essentially, this means emulating a realistic work environment where the engineer must have the fundamental knowledge and design skills, but is able to solicit general guidance.

The teaching methods adopted are optimised to ensure the aims and learning outcomes of the course are achieved.

These include:

- Design tasks that are formulated to enable the students to combine their theoretical knowledge acquired from the technical subjects.
- Assessments targeted at evaluating the students' abilities and identifying areas for improvement in their skill base.
- A laboratory organisation that in addition to the evaluation of the design process, provides the opportunity for students to improve their presentation and communications skills, as well as their sense of working in an engineering community.
- Lectures/demonstrations to provide feedback on the completed design task.
- Consultation to allow the students to seek assistance should the formal teaching methods prove insufficient.

Learning in this course

The laboratories will form the primary method of learning for this course. You are expected to attend all labs, and lab exam. You must prepare well for your laboratory classes and your lab work will be assessed. In addition to the lab work, you would have regular feedback sessions with your lecturer at the start of each new lab design, for a face-to-face discussion. Furthermore, you would have the option of attending an open laboratory session should you need extra time to complete your laboratory's task.

Laboratory Exemption

There is no laboratory exemption for this course. If, for medical reasons, (note that a valid medical certificate must be provided) you are unable to attend a lab, you will need to apply for a catch-up lab during another lab time, as agreed by the lecturer.

Assessment

The assessment consists solely of the lab and there is **no final examination**. Each of the three labs is worth 25% and a pass mark (12.5%) must be obtained for each of them for the student to pass the subject. A student is allowed to fail only one lab in the regular part of the course. In this case, the student will get a chance to undertake a supplementary lab in the last week of the semester (weeks 12-13). If the student then performs satisfactorily, that student will get a mark of 12.5%. Therefore, for the failed lab, the student's maximum

attainable mark reduces by 12.5%. Students who have passed all of their labs may retake one lab if it can be justified that this will enhance their learning.

Laboratory Exam

To check that you have achieved the practical learning outcomes for the course, you will be examined in the laboratory. Laboratory Exam is a practical exam that includes your knowledge of previous designs and analytical calculations. The exam questions will be based on what you have learned in your laboratory classes and lectures, and marks will be awarded for the correct understanding of practical and relevant theoretical concepts, correct operation of laboratory equipment, and correct interpretation of measured results.

Relationship of Assessment Methods to Learning Outcomes

Assessment	Learning outcomes						
	1	2	3	4	5	6	7
Laboratory practical assessments	✓	✓	-	✓	✓	✓	-
Lab exam	✓	-	✓	✓	-	✓	✓

Course Resources

Textbooks

This course has no specific recommended text. As it heavily relies on the technical knowledge of other courses, the textbooks of those subjects and their course notes are recommended resources for the students.

On-line resources

Moodle: As a part of the teaching component, Moodle will also be used. Lab assessment marks will also be available via Moodle.

<https://moodle.telt.unsw.edu.au/login/index.php>.

Mailing list

Announcements concerning course information will be given in the laboratories and/or on Moodle.

Other Matters

Academic Honesty and Plagiarism

Plagiarism is the unacknowledged use of other people's work, including the copying of assignment works and laboratory results from other students. Plagiarism is considered a form of academic misconduct, and the University has very strict rules that include some severe penalties. For UNSW policies, penalties and information to help you avoid plagiarism, see <https://student.unsw.edu.au/plagiarism>. To find out if you understand plagiarism correctly, try this short quiz: <https://student.unsw.edu.au/plagiarism-quiz>.

Student Responsibilities and Conduct

Students are expected to be familiar with and adhere to all UNSW policies (see <https://student.unsw.edu.au/guide>), and particular attention is drawn to the following:

Workload

It is expected that you will spend at least **ten to twelve 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 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.

Attendance

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 and 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 and 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 and Supplementary Examinations

You must submit all assignments and attend all examinations scheduled for your course. You should seek assistance early if you suffer illness or misadventure which affects your course progress. All applications for special consideration must be **lodged online through myUNSW within 3 working days of the assessment**, not to course or school staff. For more detail, consult <https://student.unsw.edu.au/special-consideration>.

Continual 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 Course and Teaching Evaluation and Improvement Process. You can also provide feedback to ELSOC 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.

In response to previous feedbacks, open laboratory slots in addition to regular lab sessions have been added to enhance practical learning throughout the semester.

Administrative Matters

On issues and procedures regarding such matters as special needs, equity and diversity, occupational health and safety, enrolment, rights, and general expectations of students, please refer to the School and UNSW policies:

<http://www.engineering.unsw.edu.au/electrical-engineering/policies-and-procedures>

<https://my.unsw.edu.au/student/atoz/ABC.html>

Appendix A: Targeted Graduate Capabilities

Electrical Engineering and Telecommunications programs are designed to address the following targeted capabilities which were developed by the school in conjunction with the requirements of professional and industry bodies:

- The ability to apply knowledge of basic science and fundamental technologies;
- The skills to communicate effectively, not only with engineers but also with the wider community;
- The capability to undertake challenging analysis and design problems and find optimal solutions;

- Expertise in decomposing a problem into its constituent parts, and in defining the scope of each part;
- A working knowledge of how to locate required information and use information resources to their maximum advantage;
- Proficiency in developing and implementing project plans, investigating alternative solutions, and critically evaluating differing strategies;
- An understanding of the social, cultural and global responsibilities of the professional engineer;
- The ability to work effectively as an individual or in a team;
- An understanding of professional and ethical responsibilities;
- The ability to engage in lifelong independent and reflective learning.

Appendix B: UNSW Graduate Capabilities

The course delivery methods and course content directly or indirectly addresses a number of core UNSW graduate capabilities, as follows:

- Developing scholars who have a deep understanding of their discipline, through lectures and solution of analytical problems in tutorials and assessed by assignments and written examinations.
- Developing rigorous analysis, critique, and reflection, and ability to apply knowledge and skills to solving problems. These will be achieved by the laboratory experiments and interactive checkpoint assessments and lab exams during the labs.
- Developing independent, self-directed professionals who are enterprising, innovative, creative and responsive to change, through challenging design and project tasks.
- Developing citizens who can apply their discipline in other contexts, are culturally aware and environmentally responsible, through interdisciplinary tasks, seminars and group activities.

Appendix C: Engineers Australia (EA) Professional Engineer Competency Standard

	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	✓