



School of Electrical Engineering and Telecommunications

Term 2, 2021  
Course Outline

# ELEC9123 Design Proficiency

## COURSE STAFF

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**Consultations:** Please post any administrative or technical questions in the Moodle discussion forums. It is recommended that students use the allocated laboratory times to ask the lab demonstrators to answer their questions as this will ascertain the most detailed and fastest response. However, you can also email questions

Give the students the opportunity to improve their design skill base and engineering practice skills required by professional engineers.

### Indicative Lecture Schedule

| Period  | Summary of Lecture Program                                                                          |
|---------|-----------------------------------------------------------------------------------------------------|
| Week 1  | Introduction to course and important technical/design skills. Design Task 1 is given and explained. |
| Week 2  | Work on Design Task 1                                                                               |
| Week 3  | <b>Design Task 1 assessment due</b>                                                                 |
| Week 4  | Design Task 2 is given and explained                                                                |
| Week 5  | Work on Design Task 2                                                                               |
| Week 6  | Work on Design Task 2                                                                               |
| Week 7  | <b>Design Task 2 assessment due</b>                                                                 |
| Week 8  | Design Task 3 is given and explained                                                                |
| Week 9  | Work on Design Task 3                                                                               |
| Week 10 | <b>Design Task 3 assessment due</b>                                                                 |

### Assessment:

| Assessment item                          | Assessment Weight                                   |
|------------------------------------------|-----------------------------------------------------|
| Design Task 1                            | 35% (21% Design implementation; 14% Design Journal) |
| Design Task 2                            | 40% (24% Design implementation; 16% Design Journal) |
| Design Task 3                            | 20% (12% Design implementation; 8% Design Journal)  |
| Online Engagement/Participation Activity | 5%                                                  |
| <b>TOTAL</b>                             | <b>100%</b>                                         |

The assessment consists solely of the three design tasks - there is no final examination.

**Design Tasks** Design Tasks 1 and 2 are each worth 35% and 40% respectively. **You must pass both Design Tasks 1 and 2 to pass this course.** Design Task 3 is worth 20% and is much more difficult than the other tasks. You can pass this course without attempting Design Task 3, but you will not maximize your total course mark in this instance. Hence, Design Task 3 is meant to rigorously test your design and knowledge skills to achieve a high mark for this course. A student will get a chance to undertake a supplementary design task after the final week of the term if a fail mark is achieved for Design Task 1 **or** 2 (not both).

The design tasks will focus on the field of microgrids. The first design task is in the field of control systems for alternating current circuits. Then you must select either the topic of microgrid power system design or microgrid telecommunication system design for Design Tasks 2 **and** 3. Note that this decision will occur during week 2. It is recommended that the decision be based around which field best suits your background electrical engineering study and industry experience.

This course will use Class Notebook from the ELEC9123 Microsoft Teams channel. Here, you are required to develop a design journal which will be assessed on the Friday of the final week of each design task (Weeks 3, 7, and 10). Note that you do NOT need to submit the journal to Moodle, as the markers have access to the Class Notebook. In the design journal, students will be able to self-reflect on their work and experiences with the design task. Students should provide a description of the research, design, experimentation, and successful and failed attempts towards their final design for the course. In the same journal, the students should also provide a detailed reference and online resource list that they used in order to complete the design task. The Design Journal will be reviewed during a seminar oral at end of Weeks 3, 7 and 10. In the seminar oral, a lab demonstrator will ask questions about the design to the student and will review the design log to assign a mark for Design Journal (40% of the total mark of each design task). More detail on the design journal and seminar oral will be provided during the term.

**Online Activity/Participation** Student attendance at each compulsory Friday lab/lecture session will be recorded. At the completion of week 10, an attendance mark will be awarded out of 5% (where 5% is awarded for attendance at **all** Friday sessions from weeks 1-10). Missing a session will result in the 5% being scaled to reflect the number of attended sessions.

### **Deadlines**

Topic selection for Design Tasks 2 and 3 (either Power or Telecommunications) is due in **Week 2, Tuesday 8<sup>th</sup> June at 11pm.**

### **COVID19 - Important Health Related Notice**

Your health and the health of those in your class is critically important. You must stay at home if you are sick or have been advised to self-isolate by [NSW health](#) or government authorities. Current alerts and a list of hotspots can be found [here](#) **You will not be penalised for missing a face-to-face activity due to illness or a requirement to self-isolate.** We will work with you to ensure continuity of learning during your isolation and have plans in place for you to catch up on any content or learning activities you may miss. Where this might not be possible, an application for fee remission may be discussed.

If you are required to self-isolate and/or need emotional or financial support, please contact the [Nucleus: Student Hub](#). If you are unable to complete an assessment, or attend a class with an attendance or participation requirement, please let your teacher know and apply for [special consideration](#) [Special Consideration portal](#) University of a positive COVID-19 test result or if you suspect you have COVID-19 and are being tested, please fill in this [form](#).

UNSW requires all staff and students to follow NSW Health advice. Any failure to act in accordance with that advice may amount to a breach of the Student Code of Conduct. Please refer to the [Safe Return to Campus](#) guide for students for more information on safe practices.

## **COURSE DETAILS**

### **Credits**

This is a 6 UoC course and the expected workload is 15 hours per week

This course is designed to provide the above learning outcomes which arise from targeted graduate capabilities listed in **Appendix A**. The targeted graduate capabilities broadly support the UNSW and Faculty of Engineering graduate capabilities (listed in **Appendix B**). This course also addresses the Engineers Australia (National Accreditation Body) Stage I competency standard as outlined in **Appendix C**.

### **Syllabus**

This course consists of design tasks in the areas of control systems, and either microgrid telecommunications or microgrid power system design.

## **TEACHING STRATEGIES**

### **Delivery Mode**

The laboratories will form the primary method of instruction for this course. Students are also expected to perform design work outside of these laboratory sessions. During the lab session, students 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 optimized to ensure the aims and learning outcomes of the course are achieved.

If a student passes both Design Tasks 1 and 2 and has a perfect attendance record to the compulsory lab sessions, then they **will** pass the subject. This means that a minimum of the basic mark, from Table 1, must be achieved for both assessment categories in each of these design tasks. A student can pass this course without attempting Design Task 3, but they will not maximize their total course mark in this instance. Hence, Design Task 3 is meant

Table 1: Course and Lab Grading

| Marks Range | Grade        |
|-------------|--------------|
| <50%        | Fail         |
| 50 64%      | Basic        |
| 65 74%      | Satisfactory |
| 75 84%      | High         |
| 85%         | Outstanding  |

Each Design Task has a minimum level of functionality to pass the Design Implementation component and hence pass the assignment. The design tasks also have a list of deliverables which are ranked from Basic to Outstanding. Completing the higher-grade deliverables will generate a higher mark for the Design Implementation component. Correctly completing the Outstanding-Level deliverable for a task will maximise the mark for the Design Implementation component.

Marking of a Design Task will take place in lab oral seminars during each Friday of weeks 3, 7 and 10. The seminar oral consists of a lab demonstrator checking that your simulation file performs correctly/incorrectly for each deliverable and the demonstrator assigning a grade for Design Implementation (60% of total assignment mark). The seminar also includes the demonstrator asking the student questions to test their understanding of their design and reviewing their design journal. The demonstrator will then assign a grade for Design Journal (40% of total assignment mark). Note that these assessment seminar consultations are thorough and may take up to an hour for each student. The student will be asked about all different facets of their design during these sessions. If there are any suspicions that the design is not own work, then this will be dealt with in accordance with UNSW Policy on Academic Misconduct. A student must ensure that the design is their own work. A cheating student will be easily identified during the seminar oral. The marking sessions will be conducted via Microsoft Teams. More information on these marking sessions, including the scheduling of the sessions on the Friday of weeks 3, 7 and 10 will be provided in the week before the task is due. Missing the scheduled seminar oral will constitute a fail grade for that assignment. A student who has missed a scheduled seminar oral may be allocated another session at the course convenor s discretion. This may include the take dloc, then this will be dealt with in e0se0se0s then this e0se0stams

### Relationship of Assessment Methods to Learning Outcomes

|                      | Learning outcomes |   |   |   |
|----------------------|-------------------|---|---|---|
| Assessment           | 1                 | 2 | 3 | 4 |
| Laboratory practical |                   |   |   |   |

### **Attendance**

Attendance at all design task assessment days (Weeks 3, 7, 10) and at the start of each design task (Weeks 1, 4, 8) is mandatory. If you are unable to attend any of the design task assessment days, you are required to notify the course convener and apply for special consideration. For further details, please visit <https://student.unsw.edu.au/special-consideration>

### **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 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 submitting 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>.

### **Continual Course Improvement**

This course is under constant revision to improve the learning outcomes for all students. Please forward any

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.