UNSW Course Outline

# ELEC3111 Distributed Energy Generation - 2024

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## General Course Information

**Course Code :** ELEC3111
**Year :** 2024
**Term :** Term 3
**Teaching Period :** T3
**Is a multi-term course? :** No
**Faculty :** Faculty of Engineering
**Academic Unit :** School of Electrical Engineering & Telecommunications
**Delivery Mode :** In Person
**Delivery Format :** Standard
**Delivery Location :** Kensington
**Campus :** Sydney
**Study Level :** Undergraduate
**Units of Credit :** 6

**Useful Links**

Handbook Class Timetable

## Course Details & Outcomes

### Course Description

Distributed energy generation is developing into a significant market in the generation, distribution and utilisation of electrical energy. It includes local fossil fuel-derived energy sources, for example, co-generation from liquefied natural gas, renewable energy sources, such

as wind and hydro, and low-carbon hybrid energy systems that combine energy sources from more than one energy source, whether renewable or fossil-fuelled. This course will equip you with the fundamental technical and economic processes and drivers at play in the electrical power industry.

Issues that will be covered include the basics of distribution network modelling, the different types of distributed energy sources utilised (combined heat and power, wind, hydro, photovoltaics, energy storage) and how they are integrated onto the electrical grid, the impact of the integration of such sources on the fundamental operation of the distribution and transmission networks, and how distributed generation is impacting on the development and operation of market frameworks.

## Course Aims

At the end of the course, you should be able to:

- Have an overview of the distributed energy generation resources and their roles in the modern electric power industry and market.
- Understand the working principles of different distributed energy generation resources and their analysis in distribution and transmission systems, which are essential knowledge and techniques to meet the low-carbon transition of electricity systems.
- Be familiar with the modelling, optimisation, and programming techniques related to the simulation and operation of distributed energy generation in modern electricity systems.

## Relationship to Other Courses

This is a 3rd year undergraduate elective course in the School of Electrical Engineering and Telecommunications. It is an elective course for students following a BE (Electrical) or (Telecommunications) program and other combined degree programs.

The course on ELEC3111 Distributed Energy Generation is interconnected with a variety of other courses that provide the necessary technical, regulatory, and strategic knowledge to effectively design, implement, and manage decentralized power generation systems.

1. **Electrical Engineering Fundamentals:** Provides a basic understanding of electrical circuits, power systems, and electrical machines, which are essential for grasping the technical aspects of DEG systems.

2. **Renewable Energy Sources:** DEG often involves renewable energy technologies like solar, wind, and hydro. This course would cover the principles behind these energy sources and how

they are harnessed.

3. **Grid Integration and Smart Grids:** DEG systems must be compatible with the existing electrical grid or capable of operating as part of a smart grid. This course would explore the technical aspects of grid integration and load managemenet.

4. **Energy Storage Technologies:** Energy storage is often paired with DEG to manage intermittent generation and improve reliability.

# Course Learning Outcomes

| Course Learning Outcomes |
|---|
| CLO1 : Identify emerging challenges in modern electricity distribution networks resulting from distributed energy sources and compare with traditional distribution systems. |
| CLO2 : Review and summarise Australian standards and grid codes for distributed energy sources |
| CLO3 : Explain the operation principles of photovoltaics, wind, and energy storage systems. |
| CLO4 : Explain the operation of a power electronics inverter and its interface to an electrical network. |
| CLO5 : Formulate phasor diagrams to analyse the impacts of distributed energy sources on the operation of electricity distribution networks. |
| CLO6 : Explain how microgrid manages distributed energy sources within an electricity distribution system. |
| CLO7 : Apply appropriate mathematical models of distributed energy sources to analyse microgrid operation problems. |

| Course Learning Outcomes | Assessment Item |
|---|---|
| CLO1 : Identify emerging challenges in modern electricity distribution networks resulting from distributed energy sources and compare with traditional distribution systems. | • Lab reports<br>• Assignments<br>• Final exam |
| CLO2 : Review and summarise Australian standards and grid codes for distributed energy sources | • Final exam |
| CLO3 : Explain the operation principles of photovoltaics, wind, and energy storage systems. | • Lab reports<br>• Assignments<br>• Final exam |
| CLO4 : Explain the operation of a power electronics inverter and its interface to an electrical network. | • Lab reports<br>• Assignments<br>• Final exam |
| CLO5 : Formulate phasor diagrams to analyse the impacts of distributed energy sources on the operation of electricity distribution networks. | • Lab reports<br>• Assignments<br>• Final exam |
| CLO6 : Explain how microgrid manages distributed energy sources within an electricity distribution system. | • Lab reports<br>• Assignments<br>• Final exam |
| CLO7 : Apply appropriate mathematical models of distributed energy sources to analyse microgrid operation problems. | • Lab reports<br>• Assignments<br>• Final exam |

# Learning and Teaching Technologies

Moodle - Learning Management System

# Learning and Teaching in this course

### Dates to note

Important Dates available at: https://student.unsw.edu.au/dates

### 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/online 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.

# Other Professional Outcomes

### Learning outcomes

After successful completion of this course, you should be able to:

LO 1: Describe and explain the basic operation and modelling of distributed electricity networks.

LO 2: Identify and demonstrate an understanding of applicable standards and grid codes.

LO 3: Describe the basic components of a range of distributed energy sources including PV, wind,

and energy storage systems.

LO 4: Describe the basic operation of a power electronics inverter and its interface to an electrical network and perform basic calculations.

LO 5: Describe and demonstrate through calculation the impacts that distributed energy sources are having on the operation of electrical networks.

LO 6: Describe how the microgrid alters the operation of electricity distribution system.

LO 7: Understand the key role that microgrid will play in facilitating distributed generation.

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.

**Relationship to Engineers Australia Stage 1 competencies:**

The Course Learning Outcomes (LOs) contribute to the Engineers Australia (National Accreditation Body) Stage I competencies as outlined below

**Engineers Australia (EA), Professional Engineer Stage 1 Competencies**

*PE1: Knowledge and Skill Base:*
PE1.1 Comprehensive, theory-based **understanding of underpinning fundamentals**: LO 1, 2
PE1.2 Conceptual understanding of underpinning maths, **analysis**, statistics, **computing**: LO 1, 2
PE1.3 In-depth understanding of specialist bodies of **knowledge**: LO 2, 3, 4
PE1.4 Discernment of knowledge development and research directions: NA
PE1.5 Knowledge of **engineering design** practice: LO 3, 4
PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice: NA

*PE2: Engineering Application Ability:*
PE2.1 Application of established engineering methods to **complex problem solving**: LO 2, 3, 4
PE2.2 Fluent **application of engineering techniques**, tools and resources: LO 1, 2, 3, 4

PE2.3 Application of systematic engineering synthesis and design processes: NA
PE2.4 Application of systematic approaches to the conduct and management of engineering projects: NA

*PE3: Professional and Personal Attributes:*
PE3.1 Ethical conduct and professional accountability: LO 4
PE3.2 Effective **oral and written communication** (professional and lay domains): LO 4
PE3.3 **Creative, innovative** and pro-active demeanour: LO 3, 4
PE3.4 Professional use and management of information: NA
PE3.5 Orderly management of **self, and professional conduct**: LO 4
PE3.6 Effective team membership and team leadership: NA

This course is also designed to provide the course learning outcomes which arise from targeted graduate capabilities. The targeted graduate capabilities broadly support the UNSW and Faculty of Engineering graduate capabilities (also listed below).

**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

**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 capable independent and collaborative enquiry, through a series of tutorials spanning the duration of the course.
- 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

# Assessments

## Assessment Structure

| Assessment Item | Weight | Relevant Dates |
|---|---|---|
| Lab reports<br>Assessment Format: Individual<br>Short Extension: Yes (3 days) | 20% | Start Date: 21/10/2024 12:00 AM<br>Due Date: To Be Announced |
| Assignments<br>Assessment Format: Individual | 30% | Start Date: To Be Announced<br>Due Date: To Be Announced |
| Final exam<br>Assessment Format: Individual | 50% | Start Date: To Be Announced<br>Due Date: Not Applicable |

## Assessment Details

### Lab reports

**Assessment Overview**

The laboratory assessment starts from week 7, which consists of weekly laboratory tasks, and is designed to check your knowledge as you progress through each stage of such laboratory tasks. The 20% lab work assessment consists of 5% on weekly online quiz and 15% on weekly lab report.

Weekly online quizzes test your understanding of the material covered in the corresponding topic. They are useful to consolidate your learning, build your knowledge, and make decisions concerning your studies early in the term. Marks will be assigned according to the correctness of the responses. Multiple attempts are allowed, and immediate right/wrong feedback will be

provided after each attempt. Detailed step-by-step solutions will be automatically released after the closing time.

A report needs to be submitted online after each lab session. The report will be marked against specific criteria in a marking guide and formal feedback on your assessment task will be provided within 10 days of the relevant submission date through the Learning Management System.

Course Learning Outcomes

- CLO1 : Identify emerging challenges in modern electricity distribution networks resulting from distributed energy sources and compare with traditional distribution systems.
- CLO3 : Explain the operation principles of photovoltaics, wind, and energy storage systems.
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- CLO5 : Formulate phasor diagrams to analyse the impacts of distributed energy sources on the operation of electricity distribution networks.
- CLO6 : Explain how microgrid manages distributed energy sources within an electricity distribution system.
- CLO7 : Apply appropriate mathematical models of distributed energy sources to analyse microgrid operation problems.

Assessment information

1. The student shall actively engage in the lab experiment, complete the task enthusiastically, and initiate critical thinking to overcome various challenges.

2. The report should be based on the student's lab experiment activities or measurement records.

3. Unless with a valid reason (such as a medical certificate) late submission will be penalized by 20% for each day late for up to a maximum 60%. Late submission after the 3rd day will not be accepted.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

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.

## Assignments

### Assessment Overview

The assignment is to test your understanding of the material covered in the corresponding topics and your ability to apply the knowledge to solve practical industry problems. The assignment tasks will be available online at the beginning of weeks 5, 7, and 9, and allow two weeks to complete and submit the report. Marking will be done with a rubric. Feedback will be provided in class during assignment reviews.

### Course Learning Outcomes

- CLO1 : Identify emerging challenges in modern electricity distribution networks resulting from distributed energy sources and compare with traditional distribution systems.
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- CLO5 : Formulate phasor diagrams to analyse the impacts of distributed energy sources on the operation of electricity distribution networks.
- CLO6 : Explain how microgrid manages distributed energy sources within an electricity distribution system.
- CLO7 : Apply appropriate mathematical models of distributed energy sources to analyse microgrid operation problems.

### Assignment submission Turnitin type

This assignment is submitted through Turnitin and students can see Turnitin similarity reports.

### 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.

## Final exam

**Assessment Overview**

The final examination tests analytical and critical thinking and general understanding of the course material. Questions may be drawn from any aspect of the course that has been presented in lectures, workshops and/or laboratories, unless specifically indicated otherwise by the lecturer. Marks will be assigned according to the correctness of the responses.

**Course Learning Outcomes**

- CLO1 : Identify emerging challenges in modern electricity distribution networks resulting from distributed energy sources and compare with traditional distribution systems.
- CLO2 : Review and summarise Australian standards and grid codes for distributed energy sources
- CLO3 : Explain the operation principles of photovoltaics, wind, and energy storage systems.
- CLO4 : Explain the operation of a power electronics inverter and its interface to an electrical network.
- CLO5 : Formulate phasor diagrams to analyse the impacts of distributed energy sources on the operation of electricity distribution networks.
- CLO6 : Explain how microgrid manages distributed energy sources within an electricity distribution system.
- CLO7 : Apply appropriate mathematical models of distributed energy sources to analyse microgrid operation problems.

**Assignment submission Turnitin type**

Not Applicable

**Hurdle rules**

In ELEC3111 Distributed Energy Generation,  the following hurdle requirement must be met in order to pass the course:  A minimum grade of **50%** must be achieved in the final examination. This component is crucial for demonstrating your ability to synthesize and apply the knowledge and skills learned throughout the course.

**Generative AI Permission Level**

**No Assistance**

This assessment is designed for you to complete without the use of any generative AI. You are not permitted to use any generative AI tools, software or service to search for or generate information or answers.
For more information on Generative AI and permitted use please see here.

## General Assessment Information

The assessment scheme in this course reflects the intention to assess your learning progress through the semester. Ongoing assessment occurs through the assignment work.

**Assignment**

The assignments allow self-directed study leading to the solution of partly structured problems. Marks are assigned according to how completely and correctly the problems have been addressed, and the understanding of the course material evident in the submission. Late submissions will attract a penalty of 10% per day (including weekends). Assignment submissions are to be made via Moodle. You must include a signed cover sheet

(see http://scoff.ee.unsw.edu.au/forms/assignmentcover.pdf)

declaring that the work submitted is your own work and this must be the first page of the assignment.

**Lab Reports**

Laboratories are primarily about learning, and the laboratory assessment is designed mainly to check your knowledge as you progress through each stage of the laboratory tasks. After completing each experiment, your work will be assessed by the laboratory demonstrator. Assessment marks will be awarded according to how much of the lab you were able to complete, your understanding of the experiments conducted during the lab, and your understanding of the topic covered by the lab.

**Final Exam**

The exam in this course is a standard closed-book two hour written examination, comprising four compulsory questions. University approved calculators are allowed. The examination tests analytical and critical thinking and general understanding of the course material in a controlled fashion. Questions may be drawn from any aspect of the course (including tutorials), unless specifically indicated otherwise by the lecturer. Marks will be assigned according to the

correctness of the responses. *Please note that you must pass the final exam in order to pass the course.*

Grading Basis

Standard

Requirements to pass course

In **ELEC3111 – Distributed Energy Generation**, the following requirement must be met in order to pass the course:

1. **Participation in Class Discussions:** Students are required to actively participate in at least 5 out of 9 class discussions. Participation includes asking questions, providing insights, and engaging in peer-to-peer learning activities.

2. **Completion of Laboratory Work:** All laboratory work or practical sessions must be completed with a minimum grade of 50%. Unfinished or failed practical work will result in not meeting the requirement.

3. **Submission of Assignments:** All assignments must be submitted on time and meet the minimum required standard as set by the instructor.

4. **Final Examination:** A minimum grade of 50% must be achieved in the final project or examination. This assessment is a critical component of the course and is designed to evaluate your understanding of key concepts which is crucial for demonstrating your ability to synthesize and apply the knowledge and skills learned throughout the course.

# Course Schedule

| Teaching Week/Module | Activity Type | Content |
|---|---|---|
| Week 1 : 9 September - 15 September | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture on Introduction to modern electric power distribution systems |
| Week 2 : 16 September - 22 September | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Overview of distributed generation technologies and applications |
| Week 3 : 23 September - 29 September | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Modelling and analysis of power distribution systems |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| Week 4 : 30 September - 6 October | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Active network and system integration of variable generation |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| Week 5 : 7 October - 13 October | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Modelling and analysis of distributed solar PV generation |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| | Laboratory | Self-paced lab induction (No attendance required) |
| Week 6 : 14 October - 20 October | Topic | Flexibility week |
| Week 7 : 21 October - 27 October | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 10:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Modelling and analysis of distributed wind generation |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| | Laboratory | Modelling of distributed solar PV generation |
| Week 8 : 28 October - 3 November | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 10:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Energy storage technologies, integration and applications |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| | Laboratory | Modelling of distributed wind generation |
| Week 9 : 4 November - 10 November | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 10:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Design concepts of microgrids |
| | Tutorial | |
| | Laboratory | Modelling of battery storage system |
| Week 10 : 11 November - 17 November | Lecture | On Tue 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>On Wed 10:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Lecture On Big data analytics in electric power distribution systems |
| | Tutorial | On Fri 09:00 - 11:00, Tyree Energy Technology LG07 (K-H6-LG07)<br>Tutorial on the questions relevant to the Assignment. |
| | Laboratory | Community Microgrid with multiple distributed generations |

## Attendance Requirements

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

## General Schedule Information

### Delivery Mode

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal online lectures, which provide you with a focus on the core analytical material in the course, together with qualitative, alternative explanations to aid your understanding;
- Tutorials, which allow for exercises in problem solving and allow time for you to resolve problems in understanding of lecture material;
- Laboratory sessions, which support the formal lecture material and also provide you with practical construction, measurement and debugging skills;
- Blended learning activities via online modules that enable active discussions.

### Learning in this course

You are expected to attend all lectures, tutorials, and labs in order to maximise learning. In addition to your lecture notes, you should read relevant sections of the recommended text. Reading additional texts will further enhance your learning experience. Group learning is also encouraged. UNSW assumes that self-directed study of this kind is undertaken in addition to attending face-to-face classes throughout the course.

### Tutorial classes

You should attempt all of your problem sheet questions in advance of attending the tutorial classes. The importance of adequate preparation prior to each tutorial cannot be overemphasized, as the effectiveness and usefulness of the tutorial depends to a large extent on this preparation. Group learning is encouraged. Answers for these questions will be discussed during the tutorial class and the tutor will cover the more complex questions in the tutorial class. In addition, during the tutorial class, 1-2 new questions that are not in your notes may be provided by the tutor, for you to try in class. These questions and solutions may not be made available on the web, so it is worthwhile for you to attend your tutorial classes to gain maximum benefit from this course.

### Lab sessions

The laboratory schedule is deliberately designed to provide practical, simulation-based exposure to the concepts conveyed in lectures soon after they are covered in class. You are required to attend laboratory in Weeks 7-10. Laboratory attendance WILL be kept, and you MUST attend all the labs.

# Course Resources

## Prescribed Resources

Textbooks

Reference books: The following textbooks are recommended reading:

- Ned Mohan, Tore M. Undeland, William P. Robbins, 'Power Electronics: Converters, Applications, and Design', Wiley, 3rd Edition, 2002.
- Turan Goì^nen, 'Electric Power Distribution Engineering', 3rd Edition, CRC Press, 2014.
- William H. Kersting, 'Distribution System Modelling and Analysis', 4th Edition, CRC Press, 2017.

On-line resources

As a part of the teaching component, the online teaching and learning management system known as Moodle will be used to disseminate teaching materials, host forums and quizzes. As the course progresses, students' marks from assessments such as labs and the quizzes are available for personal viewing on this website:

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

# Staff Details

| Position | Name | Email | Location | Phone | Availability | Equitable Learning Services Contact | Primary Contact |
|---|---|---|---|---|---|---|---|
| Convenor | Chaojie Li | | Room 301, Electrical Engineering Building (G17) | | Friday 2:00pm-4:00pm | No | Yes |
| Lab staff | Renyou Xie | | Room 301, Electrical Engineering Building (G17) | | Friday 2:00pm-4:00pm | No | No |
| Lecturer | Ahmed Musleh | | Room 401, Electrical Engineering Building (G17) | | Friday 2:00pm-4:00pm | Yes | No |
| Lab staff | Shaokang Guan | | Room 301, Electrical Engineering Building (G17) | | Friday 2:00pm-4:00pm | No | No |

# 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)

## School-specific Information

### 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.

### Use of AI for assessments

Your work must be your own. If you use AI in the writing of your assessment, you must acknowledge this and your submission must be substantially your own work. More information can be found on this website.

### Workplace Health & Safety (WHS)

WHS for students and staff is of utmost priority. Most courses involve laboratory work. You must follow the rules about conduct in the laboratory. About COVID-19, advice can be found on this website.

## School Contact Information

**Consultations:** Lecturer consultation times will be advised during the first lecture. You are welcome to email the tutor or laboratory demonstrator, who can answer your questions on this course and can also provide you with consultation times. ALL email enquiries should be made from your student email address with ELEC/TELExxxx in the subject line; otherwise they will not be answered.

**Keeping Informed:** Announcements may be made during classes, via email (to your student email address) and/or via online learning and teaching platforms – in this course, we will use Moodle https://moodle.telt.unsw.edu.au/login/index.php. Please note that you will be deemed to have received this information, so you should take careful note of all announcements.

### Student Support Enquiries

For enrolment and progression enquiries please contact Student Services

### Web

Electrical Engineering Homepage