

ELEC 4003 POWER QUALITY

Credit Points 10

Legacy Code 300995

Coordinator Ali Hellany ([https://directory.westernsydney.edu.au/search/name/Ali Hellany/](https://directory.westernsydney.edu.au/search/name/Ali%20Hellany/))

Description This subject focuses on general power quality phenomena, how to define them, locate their sources and how to apply mitigation techniques. Through independent learning and teamwork on real world case studies, and by incorporating current standards and practices, students will develop skills to simulate and analyse power quality events. The skills developed in this subject will benefit students who are looking to incorporate sustainable and renewable energy solutions into their engineering career pathways.

School Eng, Design & Built Env

Discipline Electrical Engineering

Student Contribution Band HECS Band 2 10cp

Check your fees via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 4 subject

Restrictions

Students must be enrolled in programs 3740 Bachelor of Engineering (Honours) or 3771 Bachelor of Engineering Advanced (Honours) and must have successfully completed 150 credit points.

Assumed Knowledge

Students are expected to be familiar with basic power system calculations including balanced and unbalanced three-phase systems.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Analyse power quality disturbances, their causes, their impact on electrical equipment, and mitigation.
2. Critically apply Australian and international codes and standards in power quality analysis and risk assessment.
3. Measure power quality events using simulation software and hardware tools.
4. Present cost-effective mitigation solutions to power quality problems in written and oral forms.

Subject Content

- Power Quality events
- Sags and swells
- Harmonics, flickering
- Power factor and hosting study
- Simulation and Mitigation techniques
- Soft skills development such as technical report writing, teamwork, customer-focused orientation, and presentation

Special Requirements

Essential equipment

- Simulation software NEPLAN, MATLAB, MathWorks
- Hardware and measuring tools
- Field Trip

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/ Group Task	Mandatory
Practical	10-15 minutes demonstration	40	N	Individual	N
Log/ Workbook	Weekly 100-150 words	30	N	Individual	N
Report	1500 words per student	30	N	Group	N

Teaching Periods

Autumn (2025) Penrith (Kingswood)

On-site

Subject Contact Ali Hellany ([https://directory.westernsydney.edu.au/search/name/Ali Hellany/](https://directory.westernsydney.edu.au/search/name/Ali%20Hellany/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC4003_25-AUT_KW_1#subjects)