

# ELEC 7004 ADVANCED POWER QUALITY

Credit Points 10

Legacy Code 301025

Coordinator Ali Hellany (<https://directory.westernsydney.edu.au/search/name/Ali Hellany/>)

**Description** This subject is to introduce students to power quality phenomena such as voltage sag/swell, distortions, unbalance, and flicker that occur in power systems. The subject also introduces terms and definitions associated with power quality, following which each phenomenon, that is, voltage sag/swell, transient overvoltage, and harmonics. In addition, flicker is presented and discussed in detail for students to understand the sources and impact of these occurrences on power system as well as typical mitigation techniques. Finally, students are introduced to power quality benchmarking, monitoring, assessment. In addition Advanced knowledge on network frequency responses is presented.

**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/](https://www.westernsydney.edu.au/currentstudents/current_students/fees/)) page.

**Level** Postgraduate Coursework Level 7 subject

## Restrictions

Students must be enrolled in 3693 Master of Engineering, 3695 Graduate Certificate in Engineering or the Master of Research.

## 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. Identify and classify power quality disturbances, their causes, and their impact on electrical equipment.
2. Apply Australian and international codes and standards to Power quality analysis as well as describe the terminology used in power quality engineering.
3. Review the types of hardware and test software tools available for use in power quality investigations.
4. Plan a power quality investigation, examine recorded data, and diagnose specific power quality problems.
5. Recommend appropriate mitigation techniques for power quality problems in proposed or existing designs.
6. Evaluate power quality problems and document your finding via a written report.

## Subject Content

1. Power-Quality Standards
2. Voltage Distortion
3. Harmonics and Inter-harmonics
4. Harmonic Current Sources
5. Power Harmonic Filters

6. Methods for Correction of Power-Quality Problems
7. Power Quality Events
8. Power Quality Measurements
9. Advanced Power quality analysis

## 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
Presentation	No more than 3000 words	35	N	Individual	Y
Report	No more than 5000 words.	65	N	Individual	Y

## Teaching Periods

### Autumn (2025)

#### Parramatta City - Macquarie St

##### On-site

**Subject Contact** Ali Hellany (<https://directory.westernsydney.edu.au/search/name/Ali Hellany/>)

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC7004\\_25-AUT\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC7004_25-AUT_PC_1#subjects))