

# ELEC 3009 POWER SYSTEMS

**Credit Points** 10

**Legacy Code** 300771

**Coordinator** Mahmood Nagrial ([https://directory.westernsydney.edu.au/search/name/Mahmood Nagrial/](https://directory.westernsydney.edu.au/search/name/Mahmood%20Nagrial/))

**Description** This subject provides students with a global picture of electrical energy systems. Through practical exercises students will examine and analyse the basic processes of generation, transmission and distribution, power system analysis and planning as well as power systems operation under steady-state and transient conditions. Various aspects of power system operation including harmonics, fundamentals of protection, environmental issues and renewable energy systems are also covered in this subject.

**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** Undergraduate Level 3 subject

**Pre-requisite(s)** ELEC 2010 or ELEC 3011

**Assumed Knowledge**

Basic knowledge of power frequency devices and systems.

## Learning Outcomes

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

1. Summarize and critique the operation of the power supply system grid under normal and transient conditions.
2. Complete basic power systems analysis.
3. Identify and utilize the notions and implications of power system fault levels and stability.
4. Explain Harmonics and their causes, power factor including harmonics.
5. Explain some of the environmental issues associated with energy conversion systems.
6. Identify and critique alternative energy sources.

## Subject Content

Overview of generation, transmission and distribution in power systems

Determination of transmission line parameters

Power systems behaviour in steady state and transient conditions

Power system stability

Economic dispatch and unit commitment

Renewable energy sources and their impact on power systems

## 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	2 hours (per practical)	25	N	Individual	Y
Intra-session Exam	1 hour	25	N	Individual	Y
Final Exam	2 hours	50	N	Individual	Y

Teaching Periods

## Sydney City Campus - Term 2 (2025)

### Sydney City

**On-site**

**Subject Contact** Ehsan Gatavi ([https://directory.westernsydney.edu.au/search/name/Ehsan Gatavi/](https://directory.westernsydney.edu.au/search/name/Ehsan%20Gatavi/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC3009\\_25-SC2\\_SC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC3009_25-SC2_SC_1#subjects))

## Spring (2025)

### Penrith (Kingswood)

**On-site**

**Subject Contact** Mahmood Nagrial ([https://directory.westernsydney.edu.au/search/name/Mahmood Nagrial/](https://directory.westernsydney.edu.au/search/name/Mahmood%20Nagrial/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC3009\\_25-SPR\\_KW\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC3009_25-SPR_KW_1#subjects))

### Parramatta City - Macquarie St

**On-site**

**Subject Contact** Mahmood Nagrial ([https://directory.westernsydney.edu.au/search/name/Mahmood Nagrial/](https://directory.westernsydney.edu.au/search/name/Mahmood%20Nagrial/))

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC3009\\_25-SPR\\_PC\\_1#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC3009_25-SPR_PC_1#subjects))