

# ELEC 3008 INSTRUMENTATION AND MEASUREMENT

**Credit Points** 10

**Legacy Code** 300075

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

**Description** Through practical exercises students will engage with engineering measurement and instrumentation systems. Students determine the most appropriate measurement method and instrument, such as multimeters, digital oscilloscopes and interfacing modules, for particular applications. They will gain experience with the measurement of physical quantities and the instrumentation required to accurately present information to a controller. Additionally, transducers used to measure common physical quantities are presented in detail, while instrumentation includes a detailed analysis of zero-span circuits, Wheatstone bridges, instrumentation amplifiers, isolation amplifiers, voltage-to-current and voltage-to-frequency modules used for faithful signal transmission, digital-to-analogue and analogue-to-digital circuits to deepen student learning.

**School** Eng, Design & Built Env

**Student Contribution Band** HECS Band 2 10cp

Check your HECS Band contribution amount 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 2001 OR ENGR 2001

## Learning Outcomes

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

1. Make use of a variety of transducers to measure physical parameters
2. Estimate the errors involved in making measurements
3. Design and test electronic instrumentation using discrete and integrated circuit components
4. Interface a wide variety of transducers
5. Utilize A/D and D/A converters in the context of digital control
6. Avoid configurations of equipment that lead to grounding problems

## Subject Content

Estimation of errors in measurements.  
Transducers, primary & secondary sensors.  
General measurement systems.  
Design of Signal Conditioners.  
Effects of loading in electronic circuits.  
Noise in measurements.  
Aspects of grounding practices.  
A-D/D-A Conversion.

## 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.

Item	Length	Percent	Threshold	Individual/ Group Task
Professional task	4 submissions required	50	N	Individual
Practical Exam	2 hours	50	N	Individual

Prescribed Texts

- Johnson, CD 2014, Process control instrumentation technology, 8th international edn, Pearson Education Limited, Essex, UK

Teaching Periods

## Sydney City Campus - Term 1

### Sydney City

**Day**

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC3008\\_22-SC1\\_SC\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC3008_22-SC1_SC_D#subjects))

## Spring

### Penrith (Kingswood)

**Day**

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC3008\\_22-SPR\\_KW\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC3008_22-SPR_KW_D#subjects))

## Parramatta - Victoria Rd

**Day**

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC3008\\_22-SPR\\_PS\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC3008_22-SPR_PS_D#subjects))

## Sydney City Campus - Term 3

### Sydney City

**Day**

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

View timetable ([https://classregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC3008\\_22-SC3\\_SC\\_D#subjects](https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC3008_22-SC3_SC_D#subjects))