

# ELEC 7005 ADVANCED SIGNAL PROCESSING

**Credit Points** 10

**Legacy Code** 300596

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

**Description** This subject covers the principles and techniques in signal processing. The subject matter includes advanced topics in discrete-time signals and systems, the z-transform and its applications in signal processing, advanced topics in the sampling of continuous-time signals, FIR and IIR filter design, filter structures, and the discrete Fourier transform and its computation. Students develop skills of analysing and designing digital signal processing systems.

**School** Eng, Design & Built Env

**Discipline** Electrical And Electronic Engineering And Technology

**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

**Equivalent Subjects** LGYA 5840 - Signal Processing 1

## Restrictions

Students must be enrolled in a postgraduate program

## Assumed Knowledge

Engineering mathematics, circuit theory, signals and systems.

## Learning Outcomes

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

1. Analyse discrete-time signals and systems mathematically;
2. Explain the z-transform and its applications in signal processing mathematically;
3. Explain the sampling of continuous-time signals mathematically;
4. Design FIR and IIR filters;
5. Analyse filter structures mathematically;
6. Explain the discrete Fourier transform mathematically and apply it to signal processing.

## Subject Content

Advanced topics in discrete-time signals and systems

The z-transform and its applications in signal processing

Advanced topics in the sampling of continuous-time signals

FIR and IIR filter design

Filter structures

The discrete Fourier transform and its computation

## 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	5 pages each	20	N	Individual	N
Intra-session Exam	1.5 hours	30	N	Individual	N
Final Exam	2 hour	50	N	Individual	Y

## Prescribed Texts

- Oppenheim, AV & Schafer, RW 2010, Discrete-time signal processing, 3rd edn, Pearson, Upper Saddle River, NJ.

## Teaching Periods

### Spring (2025)

#### Parramatta City - Macquarie St

#### Hybrid

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

View timetable ([https://classregistration.westernsydney.edu.au/odd/timetable/?subject\\_code=ELEC7005\\_25-SPR\\_PC\\_3#subjects](https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC7005_25-SPR_PC_3#subjects))