

# 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 unit 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

**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.

Item	Length	Percent	Threshold	Individual/Group Task
Three laboratory	5 pages each	20	N	Individual
Mid-Semester Test	1.5 hours	30	N	Individual
Final examination	2 hour	50	N	Individual

## Prescribed Texts

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

## Teaching Periods

### Spring Penrith (Kingswood) Day

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

### Parramatta City - Macquarie St Day

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View timetable ([https://clasregistration.westernsydney.edu.au/even/timetable/?subject\\_code=ELEC7005\\_22-SPR\\_PC\\_D#subjects](https://clasregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC7005_22-SPR_PC_D#subjects))