



Course Outline

ENGN2228 Signal Processing

Version: 23 July 2017

Semester 2, 2017

Unit Value: 6

Pre-requisites:

- BE students: ENGN2218 Electronic Systems and Design

1. Course Convenor and Lecturer

Name: Prof Rodney Kennedy

Office: Brian Anderson Building (115), B136

Office hours: 10–12 Tuesday, and (by appointment)

Email: rodney.kennedy@anu.edu.au

Phone: 6125 8660 (external) or 58660 (internal ANU)

2. Course Description

2.1 Overview

This course presents the principles, theory and techniques fundamental to the analysis and design of continuous time and discrete time signal processing systems. The concepts are illustrated with examples from circuit theory, signal processing, bio-medical engineering, communications, etc. The course has three hardware laboratories using the Telecommunications Instructional Modelling System (TIMS) and one computer laboratory based around MATLAB.

2.2 Learning Outcomes

Upon successful completion of this course, students should be able to:

1. demonstrate an understanding of continuous-time and discrete-time signals and other underpinning concepts such as causality, linearity, time invariance and stability
2. understand the notion of mechanical, thermal and electrical analogies and the application of common engineering tools and techniques to problem solving across these disciplines
3. have an in-depth understanding of and use of convolution, impulse response, frequency response and the characteristics of low-pass, band-pass and high-pass filters
4. demonstrate an understanding of engineering design practice and the broad principles of analysis and synthesis
5. demonstrate effective reporting of laboratory work
6. demonstrate in-depth understanding of sampling, the Sampling Theorem, aliasing and the Nyquist frequency
7. demonstrate understanding continuous time processing design via sampling and digital processing

2.3 Course Websites

ANU Wattle website

- course administration
- laboratory (CLAB and HLAB) group selection
- tutorial group selection
- echo360 audiovisual recordings
- gradebook feedback
- forums

External Course Website

- handouts for assignments, laboratories and tutorials
- downloads for course lecture slides
- downloads for course lecture notes/bricks
- additional resources and links
- updates on materials

2.4 Recommended Textbook(s)

The *recommended* textbook (but *not a compulsory one*) is:

Signals and Systems

by Oppenheim and Willsky (with Nawab)

2.5 Teaching and Learning Activities

The course is organized into:

- 12 weeks of 3-hours/week lectures (recorded through Echo360)
- 5 weeks of 1-hour Tutorials
- 2 assignments
- 1 mid-semester examination in Week 7
- 3 weeks of 3-hour CLABs
- 3 weeks of 3-hour HLABS
- 10 hours/week, on average, overall course workload (including study)

2.6 Schedule/Timetable

- This is provided on the course websites as the venues and times are finalized.

3. Assessment

ASSESSMENT ITEM	MARKS
Computer Labs	6%
Hardware Labs	9%
Assignments	15%
Mid-Semester exam	20%
Final exam	50%
TOTAL	100%

4. Relationship to BE Majors

This course is part of the Electronics and Communications Major. Any student interested in a career or further study in electrical engineering will find this course interesting and relevant.