

## 訊號與系統

114-2 開課

♡ 收藏

加入預選

流水號  
19790

課號  
<> ME5224

課程識別碼  
|||| 522 U5080

無分班

3 學分

必帶 / 選修  
國際半導體學士學位學程 / 機械工程學系

林以凡

二 7, 8, 9

綜401

2 類

修課總人數 42 人  
本校 42 人

無領域專長

英文授課

NTU COOL

核心能力與課程規劃關聯圖

## 目 備註

本課程以英語授課。

## ↗ 本校選課狀況

| 已選上            | 剩餘名額     | 已登記      |
|----------------|----------|----------|
| <b>35</b> / 42 | <b>7</b> | <b>0</b> |

## 目 課程概述

This course describes signals mathematically and understand how to perform mathematical operations on signals, to classify signals as continuous-time vs. discrete time, periodic vs. non-periodic, energy vs. power signal, odd vs. even, and conjugate symmetric vs. anti-symmetric, to understand the notion of an impulse response, to perform the process of convolution between signals and to understand its implication for analysis of linear time-invariant systems, to understand the application of Fourier analysis to ideal filtering, and to develop basic problem-solving skills and to become familiar with formulating a mathematical problem from a general problem statement.

## 🕒 課程目標

The objective of this course is that by the end of the semester, you will have demonstrated

- an ability to classify signals and systems;
- a knowledge of impulse response functions and convolution for linear systems;
- a knowledge of Fourier series and periodic signals;
- an understanding of Fourier transforms for linear time invariant systems and the basics of sampling and its applications;
- a knowledge of discrete time signals systems and transforms.

## ☰ 課程要求

🕒 預期每週課前或/與課後學習時數

🕒 Office Hour

## ☑ 指定閱讀

Signals and Systems, (2nd Ed.), A. V. Oppenheim, A. S. Willsky with S. H. Nawab, Prentice-Hall, Inc.,  
New Jersey, ISBN 0-13-814757-4, 1997.

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## III 參考書目

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## 🕒 評量方式

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### 10% Computer Assignments

The computer assignments will assist students to understand what they learned in class, making the theoretical equations into a figurative concept.

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### 40% Midterms

(20% each). There are two mid-term exams in this course. Each mid-term is for 90 minutes. The midterms are scheduled on

- Midterm 1: March 31 in class.
- Midterm 2: May 12 in class.

Midterms are closed-book, closed-notes. No electronics, including calculators, cell phones, or smart watches are allowed. Midterms will be used to access demonstration of the learning objectives. Some formulas and tables may be provided.

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### 30% Final Exam

The final exam will be on June 02. The final is closed-book, closed-notes. No electronics, including calculators, cell phones, or smart watches are allowed. The final is cumulative, and some formulas and tables may be provided.

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### 20% Final Team Project

Form a team of three people. The purpose of the team project is to provide you with hands-on experience in analyzing signals and related to what we have learned in class. You are also encouraged to propose topics related to your research. However, everything you propose should be within the scope of this course. If you have doubts about your proposed project, feel free to send me an email. You have to use LaTeX template available on NTU COOL to submit your report. A gallery appreciation will be held in class on WEEK 16, June 09.

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1. 本校尚無訂定 A+ 比例上限。
  2. 本校採用等第制評定成績，學生成績評量辦法中的百分制分數區間與單科成績對照表僅供參考，授課教師可依等第定義調整分數區間。詳見 [學習評量專區](#)。
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## 🗑️ 針對學生困難提供學生調整方式

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## 🕒 補課資訊

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**2/24** Introduction to Signals, Systems, Zero Input Response  
第 1 週

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**3/03** Impulse Response, Zero State Response, Convolution  
第 2 週

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**3/10** Linear Time-Invariant Systems, System Stability and Behavior  
第 3 週

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**3/17** Fourier Series Representation of Periodic Signals  
第 4 週

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**3/24** Fourier Series Representation of Periodic Signals  
第 5 週

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**3/31** Midterm I  
第 6 週

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**4/07** The Continuous-Time Fourier Transform  
第 7 週

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**4/14** The Continuous-Time Fourier Transform  
第 8 週

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**4/21** The Discrete-Time Fourier Transform  
第 9 週

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**4/28** The Discrete-Time Fourier Transform  
第 10 週

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**5/05** Sampling Theorem  
第 11 週

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**5/12** Midterm II  
第 12 週

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**5/19** Modulation & Laplace Transform  
第 13 週

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**5/26** z-Transform  
第 14 週

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**6/02** Final Exam  
第 15 週

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