

# Course Information

李宏毅

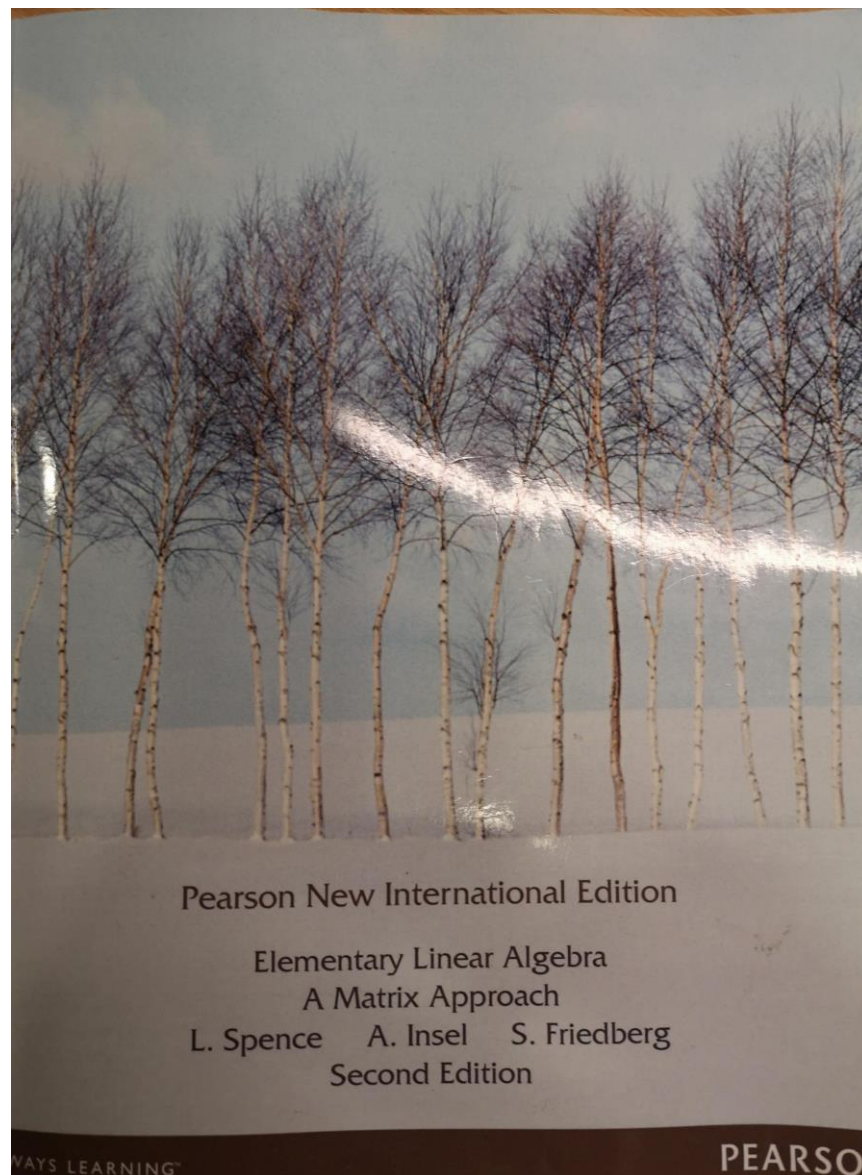
Hung-yi Lee

# 課程資訊

- 上課時間：
  - 週三上午 9:10 – 10:00
  - 週五上午 10:20 – 12:10
- 上課地點：電二143
- 評量方式：
  - 期中考 (35%)
  - 期末考 (35%)
  - 六次作業 (每個作業 6%)
    - 取最高的五次計分

# 教科書

- Elementary Linear Algebra -  
A Matrix Approach, **2nd Ed.**,  
by L. E. Spence, A. J. Insel  
and S. H. Friedberg



# 考試範圍

- 考試範圍：教科書所有未打星號\*章節

## 5.5\* APPLICATIONS OF EIGENVALUES

In this section, we discuss four applications involving eigenvalues.

### MARKOV CHAINS

Markov chains have been used to analyze situations as diverse as land use in Canada [3], economic development in New Zealand [6], and the game of chance [1] and [2]. This concept is named after the Russian mathematician A. A. Markov (1856–1922), who developed the fundamentals of the theory at the beginning of the twentieth century.

A **Markov chain** is a process that consists of a finite number of states and transition probabilities  $p_{ij}$ , where  $p_{ij}$  represents the probability of moving from state  $j$  to state  $i$ . Note that this probability depends only on the present state  $j$  and not on the past. The movement of population between the city and suburbs described in Section 2.1 is an example of a Markov chain with two states (the city and the suburbs).

In Section 5.3, we investigate matrices that are similar to a diagonal matrix.

### COMPLEX EIGENVALUES\*

We have seen in Example 3 that not all  $n \times n$  matrices or linear operators on  $\mathbb{R}^n$  have real eigenvalues and eigenvectors. The characteristic polynomial of such a matrix

The remainder of this section is used only in the description of harmonic motion (an optional topic in Section 5.5).

# 期中、期末考

- 期中和期末考則採各班統一時間舉行及命題
- 時間為期中考週和期末考週的週五
- 考試規則：
  - 除非生病(需醫師開立證明)，不得請假及要求補考
  - 考試作弊者，學期成績不及格
  - 不接受以任何方式求情要求加分或使學期成績及格

# 作業

- 作業不是勾課本習題 (課本習題請自行練習)
- 作業是線性代數的應用
- 需要使用 python
  - 會請助教來教 python
- 作業繳交日期和方式等細節另行公告

# 時程表 (暫定)

週次	進度
第一週	Chapter 1, 2
第二週	Chapter 1, 2
第三週	Chapter 1, 2
第四週	Chapter 3
第五週	Chapter 4
第六週	Chapter 4
第七週	Chapter 4
第八週	Chapter 4
第九週	期中考週
第十週	Chapter 5
第十一週	Chapter 5
第十二週	Chapter 5
第十三週	Chapter 6
第十四週	Chapter 7
第十五週	Chapter 7
第十六週	Chapter 7
第十七週	Chapter 7
第十八週	期末考週

# 其他注意事項

- 上課投影片會放在李宏毅的個人網頁上
  - [http://speech.ee.ntu.edu.tw/~tlkagk/courses\\_LA18.html](http://speech.ee.ntu.edu.tw/~tlkagk/courses_LA18.html)
- FB 社團：NTUEE Linear Algebra (2018)
  - <https://www.facebook.com/groups/988707507967491/>
  - 歡迎討論任何和線性代數相關的問題
  - 請務必加入FB社團，重要訊息除了透過學校 ceiba 寄 e-mail 外，也會透過FB 社團公告
- 助教信箱：[LinearAlgebraLee@gmail.com](mailto:LinearAlgebraLee@gmail.com)
- 有關加簽