

**NATIONAL TAIWAN UNIVERSITY**  
**Department of International Business**  
**Mathematics for Management**

**Associate Professor Jr-Yan Wang**

**Room 305, Building 2, College of Management**

[jryanwang@ntu.edu.tw](mailto:jryanwang@ntu.edu.tw)

**Fall 2014**

**Wednesday 14:20-17:20**

**02-33664987**

---

**COURSE DESCRIPTION**

This course is essentially designed to learn linear algebra, which is a branch of mathematics concerned with the study of vectors and matrices. Linear algebra is a basic but important subject since linear applications arise in many fields such as engineering, chemistry, ecology, biology, psychology, and economics and business.

This course has two layers of objectives. For the first layer of objectives, students will study basic knowledge of linear algebra. More specifically, **systems of linear equations** (線性系統), **matrix operations** (矩陣運算), **vector spaces** (向量空間), **linear transformations** (線性轉換), and **eigenvalues and eigenvectors** (特徵值與特徵向量) will be taught in this course.

For the next layer of objectives, students will learn how to employ the knowledge of linear algebra to deal with the **least squares regression** (最小平方迴歸), the **linear programming** (線性規劃), the **principal component analysis** (主成分分析), the **Monte Carlo simulation** (蒙地卡羅模擬), etc. It is worth noting that these techniques are highly applicable and useful for many management-related courses in the future.

**TEXT AND LECTURE NOTES**

Lecture Notes: <http://homepage.ntu.edu.tw/~jryanwang/> → Course Information → Mathematics for Management (undergraduate level)

(Note: DO NOT access CEIBA for the syllabus and lecture notes.)

Required Text: Elementary Linear Algebra, by Larson, 2012, 7<sup>th</sup> ed.

(The representative bookstore of this book in Taiwan is 高立圖書. If you decide to purchase the text book together, you can contact Mr. 郭吉祥 via (02) 2290-0318 ext. 231.)



## **COURSE OUTLINE**

Week	Date	Topic	Reading
1	Sept. 17	Introduction of Mathematics for Management	Syllabus
2	Sept. 24	Solving Systems of Linear Equations	Ch. 1
3	Oct. 1	Solving Systems of Linear Equations (Polynomial curve fitting)	Ch. 1
4	Oct. 8	Matrix Operations	Ch. 2
5	Oct. 15	Matrix Operations (Least squares regression)	Ch. 2
6	Oct. 22	Determinants	Ch. 3
7	Oct. 29	Determinants (Cramer's rule to solve systems of linear equations)	Ch. 3
8	Nov. 5	Vector Space	Ch. 4
9	Nov. 12	Midterm Examination	
10	Nov. 19	Vector Space	Ch. 4
11	Nov. 26	Vector Space (Change of basis and rotation)	Ch. 4
12	Dec. 3	Inner Product Space	Ch. 5
13	Dec. 10	Inner Product Space (Least squares approximation) (HW 1)	Ch. 5
14	Dec. 17	Linear Programming Problem	Ch. 9
15	Dec. 24	Linear Programming Problem (Optimization problems) (HW 2)	Ch. 9
16	Dec. 31	Eigenvalues and Eigenvectors	Ch. 7
17	Jan. 7	Eigenvalues and Eigenvectors (Principal component analysis)	Ch. 7
18	Jan. 14	Final Examination	

※ The topics in the parentheses are the examples of the applications based on the knowledge of linear algebra learned in that chapter.

## **OFFICE HOURS**

Thursday 13:30-15:30

Room 513, Building 2, College of Management

※ It is not suggested to ask academic questions in emails. The face-to-face communication is the best way to make me understand your questions and give you the most accurate instruction to solve your problems.

※ If you have difficulties to solve the quizzes or questions at the end of each chapter, please write an email to ask the teaching assistant first.

※ Try to fully utilize the office hours before making an individual appointment.

**TEACHING ASSISTANT**

王筱娟 d00723003@ntu.edu.tw