

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

Fall 2015

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 \(undergraduate level\)](#)

(The modified PowerPoint files for each week lecture are available after 9:00 p.m. every Tuesday.)

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

Required Text: Elementary Linear Algebra, by Larson, 2012, 7th 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. 16	Introduction of Mathematics for Management	Syllabus
2	Sept. 23	Solving Systems of Linear Equations (Polynomial curve fitting)	Ch. 1
3	Sept. 30	Matrix Operations	Ch. 2
4	Oct. 7	Matrix Operations (Least squares regression)	Ch. 2
5	Oct. 14	Determinants	Ch. 3
6	Oct. 21	Determinants (Cramer's rule to solve systems of linear equations)	Ch. 3
7	Oct. 28	Vector Space	Ch. 4
8	Nov. 4	Vector Space (Change of basis and rotation)	Ch. 4
9	Nov. 11	MITERM EXAM	
10	Nov. 18	Inner Product Space	Ch. 5
11	Nov. 25	Inner Product Space (Least squares approximation) (HW 1)	Ch. 5
12	Dec. 2	Linear Programming Problem	Ch. 9
13	Dec. 9	Linear Programming Problem (Optimization problems) (HW 2)	Ch. 9
14	Dec. 16	Eigenvalues and Eigenvectors	Ch. 7
15	Dec. 23	Eigenvalues and Eigenvectors (Principal component analysis)	Ch. 7
16	Dec. 30	Linear Transformations	Ch. 6
17	Jan. 6	Linear Transformations (Rotation)	Ch. 6
18	Jan. 13	FINAL EXAM	

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

※ Note that the above schedule is an estimated version, I will dynamically adjust the speed of my lecture according to the feedback of students.

OFFICE HOURS

Tuesday 10:00-11:00 and Thursday 15:00-16:00

Room 513, Building 2, College of Management

※ It is not suggested to ask academic questions in e-mails. 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 in solving exercise questions at the end of each chapter, please ask the teaching assistant first. It is preferred to make an appointment with the teaching assistant rather than ask her questions in e-mails.
- ※ Try to fully utilize my office hours before making an individual appointment.

TEACHING ASSISTANT

莊雅筑 r03724056@ntu.edu.tw