THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics
MATH 2040A (Second term, 2015-16)
Linear Algebra II
Course Outline

Course Description

This is a continuation of MATH1030. Topics include: linear mapping and its matrix representation, eigenvalues and eigenvectors, diagonalization, inner product spaces, Gram-Schmidt orthogonalization, spectral theorems, quadratic forms and Jordan canonical forms.

Pre-requisites

Students taking this course should have taken MATH 1030 "Linear Algebra I" (or classes at equivalent level). We will briefly review some of the basic concepts in the first week of class but students are expected to have good conceptual understanding and computational techniques on topics including Gaussian elimination, theory of simultaneous linear equations, matrices, determinants, vectors spaces, bases and linear independence. Students should be able to manipulate complex numbers and polynomials as well.

Instructor

- Li Man-chun Martin (Office: LSB 236. Email: `martinli@math.cuhk.edu.hk`)

Teaching Assistants

Please check the course webpage for the office hours.

- Gu Dalin (Office: AB1 407B, Email: `dlgu@math.cuhk.edu.hk`)

- Lee Cheuk Yin (Office: LSB 232, Email: `cylee@math.cuhk.edu.hk`)

- Zhang Yi (Office: AB1 505, Email: `yzhang@math.cuhk.edu.hk`)

Time and Venue

- **Lectures**: M 4:30PM - 6:15PM at LSB LT4; Th 11:30AM - 12:15PM at LSB LT5

- **Tutorials**: M 6:30PM - 7:15PM; Th 10:30AM - 11:15AM at LSB LT4

Textbook

We will be following closely the following textbook (homework problems will be taken out from the exercises in the book):

- S. Friedberg, A. Insel and L. Spence, *Linear Algebra*, 4th edition, Prentice Hall.

Lectures, Tutorials and Homeworks

Students are expected to attend all the lectures and one of the two tutorial classes per week. The lectures will focus mainly on the theoretical concepts supplied with some illustrative examples. There will be weekly problem sets which will be posted on Fridays. Students should work out these practice problems by themselves even though they are not required to hand in these homework assignments. The teaching assistants will discuss in tutorials some of the selected questions from the problem sets. Apart from the problem sets, the textbook has a vast collection of exercises at the back of each section. Students are highly encouraged to work out these exercises (keep in mind that the best way to learn mathematics is to work it out and get the feeling by yourself). Numerical answers and sketch of solutions to the problem sets will be posted on the course webpage.

Assessment Scheme

- **Quizzes**: 15%

  There will be three quizzes which will be held in class (tentatively) on January 28th, March 10th and April 14th. Each quiz will be about 15-20 minutes and they will be similar to the questions appearing in the weekly problem sets.

- **Midterms**: 30%

  There will be two in-class midterms (tentatively) on February 15th (Monday) and ~~March 24th~~ March 31st (Thursday) during class time for lectures. No make-up midterms will be given. If you are not able to attend any of the midterms, please inform the instructor as soon as possible. Under special circumstances with proof of evidence, case-by-case arrangements could be made at the discretion of the instructor. In any case, students must be present in at least one of the midterms to pass the course.

- **Final Examination**: 55%

  The final examination will be centralized by the University and it will be within the official examination period of April 27 - May 13, 2016. The exact date and time will be announced around the middle of the semester. Please do not make any travel plan until you know the examination dates. No make-ups or special arrangements can be made by the instructor or the Department.

Further readings

- Sheldon Axler, Linear algebra done right, Undergraduate Texts in Mathematics, Springer

Course Webpage

Please check regularly the following course webpage for course materials and announcements:

$$\texttt{http://www.math.cuhk.edu.hk/course/1516/math2040a}$$