THE CHINESE UNIVERSITY OF HONG KONG
Department of Mathematics
MATH 2040A (First term, 2016-17)
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 and, if time permitted, 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`)

- LAM Ming Fai (Office: LSB 222C, Email: `mflam@math.cuhk.edu.hk`)

- LEUNG LIU Yusan (Office: LSB 222B, Email: `ylleung@math.cuhk.edu.hk`)

Time and Venue

- **Lectures**: M 10:30AM - 12:15PM at LSB LT4; Th 5:30PM - 6:15PM at LSB LT3

- **Tutorials**: Th 4:30PM - 5:15PM at LSB LT3

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 <u>AND</u> the tutorials. 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 Mondays (solutions would be posted the following Monday). Students should work out these practice problems by themselves even though they are not required to hand in these homework assignments. During tutorials, the TA will first talk about some examples and then classworks would be distributed. You will have to work out the classwork and submit to the TA before the end of the tutorials. You may discuss with other classmates or seek help from the TAs when working on the classwork. 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.*

Assessment Scheme

- **Tutorial Classwork**: 5%

  You have to attend at least 10 tutorials and hand in the completed classworks before the end of each tutorial. Note that there is no tutorial on the first week and on November 17. Therefore, there are a total of 11 tutorials in the semester.

- **Midterms**: 45%

  There will be two midterms: October 18th (Tuesday) and November 15 (Tuesday) from 7:30PM-9:00PM (venue will be announced on the course webpage). It is an absolute course requirement to attend both midterms. If you are not able to attend any of the midterm due to urgent and unforseeable circumstances, case-by-case arrangements may be made at the discretion of the instructor upon receiving sufficient proof of evidence.

- **Final Examination**: 50%

  The final examination will be centralized by the University and it will be within the official examination period of December 7 - 23, 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:

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http://www.math.cuhk.edu.hk/course/1617/math2040a

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