

ECON5100: REVIEW OF QUANTITATIVE METHODS

Fall 2024

Department of Economics
The Chinese University of Hong Kong

- Instructor: HE Wei
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- Lectures:
 - 2:30 – 5:15pm (Mon, Wed, Fri) @ ELB 308, Aug 12 – 30, 2024
 - 8:30 – 11:15am (Tue) @ HYS G01, Sep 3 – 24, 2024
- Office Hour: by appointment

Course Description: This course reviews mathematical methods that are required for graduate level courses in economic theory. Topics include logic, proof methods, sets, functions, basic topology, matrix, differentiation, exponential functions, concave functions, unconstrained optimization, constrained optimization, integration, differential equations, and optimal control theory. Related economic applications will also be discussed.

Learning Outcomes: After taking this course, students should be familiar with mathematical methods that are required for graduate level courses in economic theory.

Textbook The first is the textbook.

- Simon and Blume (SB)
- de la Fuente (F)
- Chiang (C)

Grading:

- 50% Midterm Examination
- 50% Final Examination

Grade Descriptor:

- A Outstanding/Generally outstanding performance on all learning outcomes.
- A- Generally outstanding performance on all learning outcomes.
- B+ Substantial performance on all learning outcomes, OR high performance on some learning outcomes which compensates for less satisfactory performance on others, resulting in overall substantial performance.
- B Substantial performance on all learning outcomes, OR high performance on some learning outcomes which compensates for less satisfactory performance on others, resulting in overall substantial performance.
- B- Substantial performance on all learning outcomes, OR high performance on some learning outcomes which compensates for less satisfactory performance on others, resulting in overall substantial performance.
- C+ Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses.
- C Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses.
- C- Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses.
- D+ Barely satisfactory performance on a number of learning outcomes.
- D Barely satisfactory performance on a number of learning outcomes.
- F Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirements.

Course Outline:

1. Introduction
2. Sets, functions, binary relations
3. Real numbers, cardinality
4. Metric spaces, open sets, continuity
5. Compactness, convergence
6. Differential calculus, integral calculus
7. Systems of linear equations
8. Matrix algebra and Determinants
9. Unconstrained/Constrained (static) optimization
10. Dynamic programming

Academic Honesty and Related Procedures:

Attention is drawn to University policy and regulations on honesty in academic work, and to the disciplinary guidelines and procedures applicable to breaches of such policy and regulations. Details may be found at <http://www.cuhk.edu.hk/policy/academichonesty/>.

With each assignment, students will be required to submit a signed declaration that they are aware of these policies, regulations, guidelines and procedures.

- In the case of group projects, all students of the same group should be asked to sign the declaration, each of whom is responsible and liable to disciplinary actions should there be any plagiarized contents in the group project, irrespective of whether he/she has signed the declaration and whether he/she has contributed directly or indirectly to the plagiarized contents.
- For assignments in the form of a computer-generated document that is principally text-based and submitted via VeriGuide, the statement, in the form of a receipt, will be issued by the system upon students' uploading of the soft copy of the assignment.

Assignments without the properly signed declaration will not be graded by teachers.

Only the final version of the assignment should be submitted via VeriGuide.

The submission of a piece of work, or a part of a piece of work, for more than one purpose (e.g. to satisfy the requirements in two different courses) without declaration to this effect, shall be regarded as having committed undeclared multiple submission. It is common and acceptable to reuse a turn of phrase or a sentence or two from one's own work; but wholesale reuse is problematic. In any case, agreement from the course teacher(s) concerned should be obtained prior to the submission of the piece of work.