



Business Mathematics

Module 1, 2025–26

Course Information

Instructor: Young Joon Park

Email: yjpark@phbs.pku.edu.cn

Office: Room 760

Office Hours: 11:30 am–12:30 pm on Tuesday and Friday (or by appointment)

Teaching Assistant: TBA

Email: –

Office Hours:

Classes:

Lectures: Tuesday and Friday, 9:00 am–11:30 am

Venue: Room 209

Course website:

1. Course Description

1.1 Context

Course overview:

This is a required course for undergraduate students in international finance. It will provide students with a broad set of fundamental mathematical and statistical tools useful for applications throughout the social sciences. The first half of the course reviews basic concepts, and then focuses on calculus and optimization. The second half covers probability theory and statistics, with a focus on applications and data analysis.

1.2 Textbooks and Reading Materials

Textbook:

There is no required textbook for this course, however, some useful references are:

- Jacques, I., *Mathematics for economics and business*, 9th Edition, Pearson Education.
- Wainwright & Chiang, *Fundamental Methods of Mathematical Economics*, 4th edition, McGraw Hill
- Simon & Blume *Mathematics for Economist*, W. W. Norton & Company
- Barrow, M., *Statistics for economics, accounting and business studies*, 7th Edition, Pearson Education.
- Lind, D. A., Marchal, W. C., & Wathen, S. A., *Basic statistics for business and economics*, 10th Edition, McGraw-Hill.
- McClave, J. T., Benson, P. G., & Sincich, T., *Statistics for business and economics*, 14th Edition, Pearson Education.

All materials (e.g., lecture slides/notes, practice problems, etc.) will be distributed in class.

2. Learning Outcomes

2.1 Intended learning outcomes

Learning Goals	Objectives	Assessment (YES with details or NO)
1. Our graduates will be effective communicators.	1.1. Our students will produce quality business and research-oriented documents.	No
	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	Yes
2. Our graduates will be skilled in team work and leadership.	2.1. Students will be able to lead and participate in group for projects, discussion, and presentation.	No
	2.2. Students will be able to apply leadership theories and related skills.	No
3. Our graduates will be trained in ethics.	3.1. In a case setting, students will use appropriate techniques to analyze business problems and identify the ethical aspects, provide a solution and defend it.	No
	3.2. Our students will practice ethics in the duration of the program.	No
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	No
5. Our graduates will be skilled in problem-solving and critical thinking.	5.1. Our students will have a good understanding of fundamental theories in their fields.	Yes
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	No
	5.3. Our students will demonstrate competency in critical thinking.	Yes

2.2 Course-specific objectives

This course aims to provide students with a set of fundamental mathematical and statistical tools. These tools will be applied to problems in the social sciences and business.

2.3 Assessment/grading details

The grade for each student will be determined using the following types of assessment (with associated weights):

- i) Class Participation (10%)
- ii) Midterm exam (45%)
- iii) Final exam (45%)

i) Participation in class

The class attendance will be marked regularly. Furthermore, in each class, we will discuss and solve mathematics problems. Actively participating in this process (e.g., by contributing to a discussion, helping your classmates, etc.), will improve your grade. This part of the assessment is determined by your effort, rather than your performance.

ii) Midterm exam

The midterm exam will be held in class on Friday, October 10 (tentatively).

iii) Final exam

The final exam will be held from 9:00 pm to 11:00 pm on Tuesday, November 11. The final exam primarily tests the material covered after the midterm (i.e., the probability & statistics topics), however, solving some of these questions will require the use of methods covered in the calculus topic.

2.4 Academic honesty and plagiarism

A student's effort and credit need to be recognized through class assessment. Credits earned for a student's work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconduct, which includes plagiarism; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; or altering, forging, or misusing a University academic record; or fabricating or falsifying of data, research procedures, or data analysis.

All assessments are subject to an academic misconduct check. Misconduct checks may include reproducing the assessment, providing a copy to another member of the faculty, and/or communicating a copy of this assignment to the PHBS Discipline Committee. A suspected plagiarized document/assignment submitted to a plagiarism-checking service may be kept in its database for future reference purposes.

Where the violation is suspected, penalties will be implemented. The penalties for academic misconduct may include the deduction of honor points, a mark of zero on the assessment, a failing grade for the whole course, and a reference of the matter to the Peking University Registrar.

For more information on plagiarism, please refer to *PHBS Student Handbook*.

2.5 AI tools requirement

Using AI tools to complete assignments or assessments without the approval of the course instructor will be regarded as an act of academic dishonesty. Depending on the severity of the situation, penalties will be implemented in accordance with the provisions of the Peking University Graduate Student Handbook.

3. Topics, Teaching, and Assessment Schedule

- 1) Review of algebra & functions
- 2) Calculus
 - a) Differentiation
 - b) Unconstrained Optimization
 - c) Integration
 - d) Partial differentiation
 - e) Total differentiation
 - f) Constrained Optimization
 - g) Application to Economics
- 3) Probability and Statistics
 - a) Fundamentals
 - b) Conditional Probability
 - c) Discrete Distribution
 - d) Continuous Distribution
 - e) Estimation
 - f) Hypothesis Testing
 - g) Correlation
 - h) Linear Regression