Course Information

Instructor: Daeyong Lee, Ph.D
Office: Room 751, PHBS Building
Phone: 755-2603-2795
Email: daeyong@phbs.pku.edu.cn
Office Hours: M/Th 10:30~11:30 am, or by appointment

Teaching Assistant: Siyang (Samuel) Li
Email: 1501213342@sz.pku.edu.cn

Classes:
Lectures: M/Th at 13:30~15:20

Venue: PHBS Building, Room 211

Course Website:
http://cms.phbs.pku.edu.cn/claroline/course/index.php?cid=MATH_MGNT16

1. Course Description

1.1 Context
Course overview:
Business mathematics covers key mathematics concepts ranging from probability to optimization. This course reviews basic mathematical and statistical tools needed for graduate studies in management at Peking University HSBC Business School. The mathematical contents are both motivated and illustrated with economic applications. Students are required to grasp a firm concept of each topic covered in class. The ultimate goal of this course is to facilitate students to take advanced, financial, or applied econometrics.

Prerequisites:
There is no prerequisite for this class. Students with a background in statistics and/or econometrics will find this class more accessible.

1.2 Textbooks and Reading Materials
• **Required Textbook:**
Ian Jacques, *Mathematics for Business and Economics*, 7th ed, Pearson Education, 2013.
Carl P. Simon and Lawrence Blume, *Mathematics for Economists,* Norton, 1994.

• **Recommended References:**
Raymond A. Barnette, Michael R. Ziegler, and Karl E. Byleen, *College Mathematics for Business Economics, Life Sciences and Social Sciences*, 12th ed, Pearson Education, 2010.

Lecture notes will be provided. E-versions of handouts, slides, supplementary materials are also available on the Course Management System (http://cms.pkusz.edu.cn). Log on and search for Business Mathematics (Management session), you need to be registered for this course to access the materials.

2. Learning Outcomes

2.1 Intended Learning Objectives / Outcomes

Learning Goals	Objectives/Outcomes	Assessment
1. Our graduates will be effective communicators.	1.1. Our students will produce quality business and research-oriented documents.	Exams
	1.2. Students are able to professionally present their ideas and also logically explain and defend their argument.	Quiz and exams Practice questions
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.	
	2.2. Students will be able to apply leadership theories and related skills.	
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.	Quiz and Exams
	3.2. Our students will practice ethics in the duration of the program.	Quiz and Exams
4. Our graduates will have a global perspective.	4.1. Students will have an international exposure.	Quiz and Exams
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.	Quiz and exams Practice questions
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Quiz and exams Practice questions
	5.3. Our students will demonstrate competency in critical thinking.	Quiz and exams Practice questions

2.2 Course specific objectives
Please see Section 3 for specific course objectives.

2.3 Assessment/Grading Details
☐ Quiz (closed book): 30%, each 10%

☐ Exam 1 (closed book): 35%

☐ Exam 2 (closed book): 35%

☐ FYI, GPAs below 70 are considered as failure of the course by the PKU academic rule.

• **Quiz:**
During the semester, students will take 3 quizzes. The quiz will ask problem solving questions. The dates are as following: **Sep. 8, Sep. 22, and Oct. 20**. The quiz helps students to keep on track of the course and to have deeper understanding of key concepts covered in class. Students who miss a quiz DO NOT have a make-up quiz and thus will have zero score for the missing one.

• **Exam:**
There will be two exams (35% each). Both exams will include problem solving type questions. Exam 1 will be held in class on **Monday, October 10**. The Final will be held in class on

Thursday, November 3. Since **there will be no make-up exam,** please carefully plan your 2016 Fall schedule ahead.

• **Class Participation:**
Students are strongly recommended to have active participation in class such as addressing practice questions.

• **Rescheduling the Class:**
Class on September 15 → September 14 (*Mid-Autumn* Day)
No class: A week from October 1 to October 7 (*National Day*)

• **Class Policy:**
Students are not allowed to use their laptops or cellphones in the classroom.

2.4 Academic Honesty and Plagiarism

It is important for a student's effort and credit to be recognized through class assessment. Credits earned for a student work due to efforts done by others are clearly unfair. Deliberate dishonesty is considered academic misconducts, which include 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 academic misconduct check. Misconduct check may include reproducing the assessment, providing a copy to another member of faculty, and/or communicate 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 purpose.

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

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

3. Topics, Teaching and Assessment Schedule

Part 1. Functions
Objective: Students learn basic concepts of linear equations and graphs. Then, they understand different types of non-linear functions and graphs.

Week 1
1. Linear Equations and Graph

2. Functions

Part 2. Linear Algebra
Objective: Students learn basic concepts of matrices and linear independent. Then, they understand how to present a system of linear equations in matrix format, and figure out whether the system has solution(s) using determinants.

Week 2
1. Vector

2. Matrices

3. Linear Independence

Week 3
4. System of Linear Equations

5. Determinants

6. Positive and Negative Definite

Part 3. Calculus
Objective: Students learn basic concepts of multivariate functions and their derivatives. Also, they learn integration based on Fundamental Theorem of Calculus.

Week 4
1. Single and Multivariate Differentiation

2. Chain and Product Rule

Week 5
3. Integration

4. Fundamental Theorem of Calculus

Part 4. Probability
Objective: Students learn basic concepts of probability theory and understand the key ideas of state space and random variables. Also, they are able to derive CDF and PDF functions of specific distributions such as Uniform and Normal.

Week 6
1. Introduction and Overview

2. State Space and Discrete / Continuous Random Variable

Week 7
1. Independence

2. Density, PDF, and CDF

3. Mean, Variance, and Higher Moments

4. Distribution (Uniform, Normal, Chi, and etc.)

Part 5. Optimization
Objective: Students learn basic concepts of convexity and concavity of functions and their local and global min/max points based on the concept of differentiation. Then, they understand constrained/unconstrained optimization settings and figure out how to find optimal solution(s) based on Kuhn-Tucker Theorem.

Week 8
1. Convex and Concave

2. Local Min / Max vs. Global Min / Max

3. Saddle Point

Week 9
4. Unconstrained Optimization

5. Constrained Optimization

6. Kuhn-Tucker Theorem

4. Miscellaneous

I have an open door policy. If you have problems with any aspect of the course and/or want to discuss anything (e.g., course material, career opportunities in management and economics, etc.), please feel free to schedule time with me. Do not wait till the end of module to discuss any issues.