ECON(code number)
Statistics
1st Module, 2020

Course Information

Instructor: Yaein Baek
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Office Hour: Mon 13:30-14:30

Classes:
Lectures: Mon & Thur, 10:30-12:20
Venue: PHBS Building, Room

1. Course Description

1.1 Context

Course overview: This course focuses on basic concepts and theory of statistics and its applications on statistical inference in Economics. By learning fundamental theories in Statistics and Econometrics, students will understand the tools in analysing economic and financial data. This course will provide a background in statistics for students that will learn graduate level Econometrics.

Prerequisites: Mathematics (GEN500) or Business Mathematics (ECON500)

1.2 Textbooks and Reading Materials

There is one required textbook for this class: *Statistical Inference*, 2nd edition, by George Casella and Roger L. Berger.

I will post lecture notes on the CMS system (cms.phbs.pku.edu.cn). The notes serve as an outline only and many details are left out. Exam questions are likely to be based on class discussion and examples, which are omitted from lecture notes.

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	No.

	present their ideas and also logically explain and defend their argument.	
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.	Yes, the course is taught in English full-time.
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, students will learn fundamental theories in Statistics.
	5.2. Our students will be prepared to face problems in various business settings and find solutions.	Yes, by understanding methodologies used in various business settings.
	5.3. Our students will demonstrate competency in critical thinking.	Yes.

2.2 Course specific objectives

The objective of this course is to provide students with the mathematical foundations they need to understand the use of statistics in economics, and to prepare them for more advanced courses in econometrics.

2.3 Assessment/Grading Details

Midterm exam: 40%
Final exam: 60%

I will periodically assign problem sets throughout the course. Although they will not be collected or graded, it is very important to do them, as they are the best way to learn and prepare for the exams.

There will be no make-up exam, *no exceptions*. If you miss an exam due to medical reasons, and a doctor's certificate is provided, your grade will be determined by the other exam you have taken. For example, if you miss the final exam, your final exam score will be counted as 70% of your midterm exam score.

Both midterm and final exams are closed-book, you cannot bring anything except for stationery items (such as pencils and pens). Any student found responsible for violating academic honesty (see 2.4) will earn a failing grade for the course.

The midterm exam will be held during class on a date to be announced (likely to be on the 2nd week of October). The final exam will be held on the final exam schedule of the first module (November 16-17).

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

The topics covered in this course are as follows.

- Probability theory: random variables, distribution functions
- Expected values, moment generating functions, characteristic functions
- Multiple random variables: conditional distributions, independence, covariance and correlation, inequalities
- Properties of a random sample: sampling from the normal distribution, the sample mean and variance, convergence concepts
- The likelihood function, likelihood ratio tests
- Point estimation: Maximum likelihood estimation, Method of moments
- Hypothesis tests and confidence intervals
- Asymptotic evaluation: consistency, efficiency

Depending on our pace throughout the module, topics may be added or omitted. Not all topics will be covered in the same detail.