科目ナンバリング	U-LAS10 20023 LE55						
授業科目名 <英訳>	Elementary Probability-E2 Elementary Probability-E2			担当者所属 職名・氏名	情報学研究科 特定助教 MENG, Xiangqian		
群	自然科学科目群		分野(分類)	数学(発展)		使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・後期	曜時限	金3	配当学年	主として2回生	対象学生	理系向

[授業の概要・目的]

Probability theory is indispensable for understanding and describing phenomena influenced by randomness, as arise across the natural and social sciences. Furthermore, it is one of the foundations of mathematical statistics. This lecture course will provide a fundamental introduction to the modern theory of probability.

[到達目標]

1.To understand fundamental notions in probability theory such as events, random variables, independence, conditional probability, expectation, variance and correlation.
2. To understand when and how typical distributions, such as the normal distribution and Poisson distribution, appear, and mathematical treatments of those distributions.
3. To understand limit theorems, such as law of large numbers and central limit theorem. In particular, to understand when and how those theorems can be applied.

[授業計画と内容]

1. Introduction to the mathematical theory of probability (2 to 3 weeks): probability spaces, events, independence and conditional probability.
2. Introduction to the notion of random variables and related properties (4 weeks): random variable, distribution, expectation, variance, covariance, correlation, independence of random variables and Chebyshev's inequality
3. Important examples of distributions (3 weeks); Bernoulli distribution, binomial distribution, Poisson distribution, geometric distribution, uniform distribution, normal distribution, exponential distribution.
4. Limit theorems (3 to 4 weeks): law of large numbers, central limit theorem.
5. Random walks and Markov chains (supplementary).

A total of 14 lectures and one feedback class will be given.

[履修要件]

(Eligible students) mainly the sciences of the second grade. Students are required good understanding of both calculus and linear algebra.

[成績評価の方法・観点]

The evaluation of the course will mainly take into account of the result of final examination, but will also include homework and presentation elements.
The details of the evaluation system will be given by the lecturer at the first lecture.

Elementary Probability-E2(2)へ続く↓↓↓

Elementary Probability-E2(2)

[教科書]

Geoffrey Grimmett &Dominic Welsh 『Probability :An introduction(2nd edition)』 （Oxford）
Geoffrey Grimmett David R. Stirzaker 『Probability and random processes(3rd edition)』 （oxford）

[参考書等]

（参考書）
授業中に紹介する

[授業外学修（予習・復習）等]

Strongly recommend to solve exercises given in class to have a deeper understanding of contents of lectures.

[その他（オフィスアワー等）]

Office hours are by appointment.

[主要授業科目（学部・学科名）]