

統計学Ⅲ (Statistical Analysis III)

科目ナンバリング ECS-203
選択必修 2単位

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1. 授業の概要(ねらい)

In this course, we learn the basic concepts of probability theory. This is essential to study the statistical inference which will be covered in "Statistical Analysis IV." We will solve some exercises to understand more deeply the topics covered in each class.

2. 授業の到達目標

After finishing this course, you will be able to understand

- basic probability theory
- random variables ,and probability distributions,
- the statistical properties of data.

3. 成績評価の方法および基準

There will be two exams: midterm and final. Each exam has the following weight: Midterm 30-40%, Final 60-70%.

There might be some assignments (up to 10% of the final grade).

4. 教科書・参考文献

教科書

Lecture notes will be distributed for each class.

5. 準備学修の内容

Read through the lecture notes to clarify ambiguous points before attending the class.

Review the examples and exercises in the lecture notes covered in each class.

6. その他履修上の注意事項

Feel free to ask any questions during the class (or after the class / by email) so as not to leave them unanswered.

The schedule is subject to change.

7. 授業内容

- 【第1回】 Introduction
Review of Mathematics (1) Differentiation, Integration, Multivariate Calculus.
- 【第2回】 Algebra of Sets, Properties of Probability, Methods of Enumeration.
- 【第3回】 Conditional Probability.
- 【第4回】 Independence, Bayes' Theorem.
- 【第5回】 Random Variables of Discrete Type, Mathematical Expectation, Moment.
- 【第6回】 Bernoulli Distribution, Binomial Distribution, Poisson Distribution.
- 【第7回】 Law of Small Numbers, Random Variables of Continuous Type.
- 【第8回】 Midterm Examination
- 【第9回】 Explanation of Midterm Examination (ONLINE)
- 【第10回】 Continuous Distributions (1): Gamma, Exponential.
- 【第11回】 Continuous Distributions (2): Chi-squared, Beta and Normal.
- 【第12回】 Bivariate Distributions of the Discrete Case (1): Joint Probability and Marginal Probability.
- 【第13回】 Bivariate Distributions of the Discrete Case (2): Correlation Coefficient and Conditional Probability.
- 【第14回】 Bivariate Distributions of the Continuous Case (1): Marginal Probability Density Functions and Independence.
- 【第15回】 Bivariate Distributions of the Continuous Case (2): Bivariate Normal Distribution and Linear Regression.