

Mathematics II: Probability – Course Outline

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Probability Theory in Economics

- Econometric/Statistical inference
- Decision under uncertainty, strategic interaction, etc.
- Modeling heterogeneity in economic agents (inequality, firm concentration, etc.)
- Machine learning
- ...
- But this is not a course on econometrics or statistics!

Course Content and Objectives

1. Events and their probabilities
2. Random variables
3. Distribution Zoo
4. Multivariate Distributions
5. Sampling and Large Sample Theory

Schedule

Lectures on:

- Monday 4/11/24
- Wednesday 6/11/24
- Thursday 7/11/24
- Monday 11/11/24
- Wednesday 13/11/24
- Thursday 14/11/24 (only if needed)

TA sessions on:

- Friday 15/11/24 – PS1 released 6/11/24 due 13/11/24
- Friday 22/11/24 – PS2 released 13/11/24 due 20/11/24

Course Material and other useful references

The course material are the slides and Tessa's lecture notes. Other useful references are:

- Casella, G., & Berger, R. L. (2002). *Statistical Inference* (2nd ed.). Duxbury Press.
- Grimmett, G., & Stirzaker, D. (2001). *Probability and Random Processes* (3rd ed.). Oxford University Press.
- Durrett, R. (2019). *Probability: Theory and Examples* (5th ed.). Cambridge University Press.
- Nair, J., Wierman, A., & Zwart, B. (2022). *The Fundamentals of Heavy Tails: Properties, Emergence, and Estimation*. Cambridge University Press.
- Embrechts, P., Klüppelberg, C., & Mikosch, T. (1996). *Modelling Extremal Events: For Insurance and Finance*. Springer Science & Business Media.