

# Asymptotic Theory

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# Schedule

- Lecture and tutorial in English
- Modules: MS 6/7, MD E1, mandatory for Econometrics
- 4+2 format in the second half of the semester (starting 1st of December)
- In total: 2+1, 4.5 CP
- Lecture times: Wed 12:15-13:45; Thu 14:15-15:45 (CDI 120)
- Tutorial times: tbd

# Procedure

- Exercise sheets every week - rated for an honest attempt
- Take-home assignment at the end of the semester
- Currently planned: 3 honest attempts and 40% points in the assignment necessary to be eligible for the exam
- Module exam will be a written exam (60 minutes) in english
- Moodle room password „CLT“:  
<https://moodle.tu-dortmund.de/enrol/index.php?id=36210>

# Contents

- Probabilistic types of convergence – almost surely, in probability, in distribution
- Landau symbols for probabilistic convergence
- Lemma of Borel-Cantelli
- Laws of large numbers
- Central limit theorems
- Delta Method
- CLT for martingale difference sequences

## References

- Gut, A. (2013), Probability: a graduate course, Vol. 75, Springer Science & Business Media.
- Proschan, M. A. and Shaw, P. A. (2018), Essentials of probability theory for statisticians, CRC Press.
- Reid, N. et al. (2003), 'Asymptotics and the theory of inference', The Annals of Statistics 31(6), 1695–2095.
- Resnick, S. (2019), A probability path, Springer.
- Ross, K. A. (2013), Elementary analysis: the theory of calculus, Springer Science & Business Media.
- Roussas, G. G. (2014), An introduction to measure-theoretic probability, Academic Press.
- Stoll, M. (2001), Introduction to real analysis, Addison-Wesley Longman.

# Questions?

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