Probability Theory
Course formalities

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Overview Today

- Course outline
- Introduction, recap of some background
- What is probability?
- Functions of random variables
- Multivariate random variables

Course Outline

- **6 Lectures**: theory interleaved with illustrative solved examples. (Krzysztof)
- **6 Seminars**: problem solving sessions + open discussions. (Sarah)
- **1 Recap session**: Recap of the course. (Sarah)

Course literature

- Gut, A. *An intermediate course in probability*. 2nd ed. Springer-Verlag, New York, 2009. ISBN 978-1-4419-0161-3
- Slides from last year
- Chapter 1: Multivariate random variables
- Chapter 2: Conditioning
- Chapter 3: Transforms
- Chapter 4: Order statistics
- Chapter 5: The multivariate normal distribution
- Chapter 6: Convergence

Additional (more advaned) reading

- Grimmet, G. R. and Stirzaker, D. R. *Probability and Random Processes*. Oxford University Press, Oxford, 2001. ISBN 978-0198572220
- Williams, D. *Probability with Martingales*. Cambridge University Press, Cambridge, 1991. ISBN 978-0-521-40605-5

Examination

- The examination consists of a written exam with max score 20 points and grade limits:
  A: 19p, **B:** 17p, **C:** 14p, **D:** 12p, **E:** 10p.
- You are **allowed to bring** a pocket calculator to the exam, but no books or notes.
- The following will be **distributed with the exam**:
  - Table with common formulas and moment generating functions (available on the course homepage).
  - Table of integrals (available on the course homepage).
  - Table with distributions from Appendix B in the course book.
- Active participation in the seminars gives **2 bonus points** to the exam.

Bonus points

- To earn the bonus points a student must be present and active in at least 5 of the 6 seminars, so maximally one seminar can be missed regardless of reasons.
- Active participation means that the student has made an attempt to solve every exercise indicated in the timetable before respective seminar and is able to present his/her solutions on the board during the seminar. Active participation also means that the student gives help and comments to the classmates' presented solutions.
- In the seminars, for each exercise a student will be selected, using Sarah's method, to present her/his solution.
- Exercises marked with * are a bit harder and it is ok if you are not able to solve these.
- Exercises marked with self-study relate directly to the lecture. Depending on Sarah's decision they might or might not be solved at the seminar sessions.

Course homepage and materials

- GitHub: STIMALiU/ProbTheoryCoure (material)
- LISAM (materials and messages)
- https://www.ida.liu.se/~732A63/ (select English) 2016 material, not updated for 2017