



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Sannolikhetsteori och diskret matematik

Probability Theory and Discrete Mathematics

FMSF40, 7,5 credits, G2 (First Cycle)

Valid for: 2023/24

Faculty: Faculty of Engineering, LTH

Decided by: PLED I

Date of Decision: 2023-04-14

General Information

Compulsory for: IDA2, IEA2

Language of instruction: The course will be given in Swedish

Aim

The course has two main aims:

- 1) to present the basics of discrete mathematics, with particular emphasis on concepts which are important in computer science
- 2) to give a general introduction to probability theory.

Learning outcomes

Knowledge and understanding

For a passing grade the student must

- have good knowledge of how to carry through a proof in an (informal but) logically correct way
- in practical situations be able to identify and do computations on different combinatorial ways of selection
- have good knowledge of and understanding of functions and relations, as well as related concepts
- have a good understanding of the basic concepts in probability theory: independent events, probability, discrete and continuous distributions, expectation and variance
- have knowledge about how to compute, from a specific distribution, the probability of an event and the expectation and variance, and be able to show capability to carry out the computations essentially correctly.

Competences and skills

For a passing grade the student must

- be able to show good computational ability within the scope of the course
- in connection with problem solving be able to demonstrate an ability to integrate methods from different parts of the course
- be able to demonstrate an ability to explain a mathematical reasoning in a well-structured and logically clear way.

Contents

Sets. Logic. Proof techniques. Combinatorics. Recursion. Relations. Functions.

The probability axioms. Conditional probability. Independent events. Stochastic variables. Expectation and variance. The normal distribution, the binomial distribution and other important distributions. Functions of stochastic variables.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)

Assessment: Written test comprising theory and problem solving.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

Assumed prior knowledge: Basic courses in single variable calculus and linear algebra.

The number of participants is limited to: No

The course overlaps following course/s: FMSF32, FMSF20, FMSF30, FMSF35, FMSF45, FMSF50, FMSF55, FMSF70, FMSF75, FMA661, FMAA25, FMSF80

Reading list

- Vännman K, Jonsson A: Matematisk statistik, 3:e upplagan. Studentlitteratur, 2020, ISBN: 9789144133249.
- Eriksson, K & Gavel, H: Diskret matematik och diskreta modeller. Studentlitteratur, 2013, ISBN: 9789144089997.

Contact and other information

Director of studies: Johan Lindström, studierektor@matstat.lu.se

Course administrator: Susann Nordqvist, expedition@matstat.lu.se

Course homepage: <https://maths.lu.se/utbildning/hoegskoleingenjoersutbildning/>