Discrete Mathematics

Programme course

6 credits

Diskret matematik

TATA82

Valid from: 2017 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2017-01-25

Main field of study
Mathematics, Applied Mathematics

Course level
First cycle

Advancement level
G1X

Course offered for
- Industrial Engineering and Management, M Sc in Engineering
- Industrial Engineering and Management - International, M Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Single variable calculus and linear algebra

Intended learning outcomes
The course shall provide the basic knowledge within the part of mathematics which has applications in software development, theoretical computer sciences, database theory and digital technology. Students shall be able to:

- Apply set theory to calculations and to theoretical computer sciences.
- Use equivalence and partial order relations to classifying and computer sciences.
- Use mathematical induction in proofs
- Solve simple recursive equations.
- Apply combinatorial methods in calculations.
- Understand number theory and use it within public key cryptosystems
- Know concepts in graph theory and their applications to, e.g., optimization

Course content
Sets; relations: equivalence and partial order relations; induction, recurrence, combinatorics, principle for inclusion and exclusion; number theory, modular arithmetic and public key cryptography; graphs.

Teaching and working methods
Lectures and tutorials.

Examination
TEN1	Written examination	6 credits	U, 3, 4, 5

Grades
Four-grade scale, LiU, U, 3, 4, 5

Other information
Supplementary courses:
Graph theory, Number theory, Abstract algebra

Department
Matematiska institutionen

Director of Studies or equivalent
Jesper Thorén

Examiner
Milagros Izquierdo Barrios

Education components
Preliminary scheduled hours: 52 h
Recommended self-study hours: 108 h

Course literature
Asratian, A., Björn, A. och Turesson, B.O.: Diskret matematik, 2014. Alternativt Kenneth H. Rosen: Discrete Mathematics and Its Applications, McGraw-Hill Higher Education, 2011 eller Grimaldi, R.P.: Discrete and Combinatorial Mathematics, Pearson Education 2013.

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.