LINKÖPINGS UNIVERSITET

Discrete Mathematics

Programme course

6 credits

Diskret matematik

TADI31

Valid from: 2020 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2019-09-23

Main field of study

Mathematics, Applied Mathematics

Course level

First cycle

Advancement level

G1X

Course offered for

- Bachelor of Science in Computer 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.

Intended learning outcomes

To give the basic knowledge of discrete mathematics that is needed for further courses in mathematics, natural and computer science. After completing the course the student should be able to

- use the Euclidean algorithm to solve Diophantine equations
- use the principle of mathematical induction to solve recursive problems
- understand and use the terminology and laws of set theory
- formulate and solve combinatorial problems on combinations and permutations
- master the foundations of graph theory and use graphs as a tool to model real-life problems
- use the language of propositional logic, be familiar to logic operations and be able to evaluate the validity of logical conclusions.

Course content

Number theory; prime numbers, divisibility, Euclidean algorithm, Diophantine equations,
Mathematical induction and recursion.
Set theory, the laws of set theory and Venn diagrams.
Combinatorics with permutations and combinations.
Graphs: Euler paths, Hamilton cycles, trees and some applications in computer science
Logic; propositional logic, logic operations, truth tables and conclusions.

Teaching and working methods

Teaching is done through lectures and problem sessions

Examination

UPG1	Hand-in-assignment	2 credits	U, G
TEN1	A written examination	4 credits	U, 3, 4, 5

Grades

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

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is Swedish, the course as a whole or in large parts, is taught in Swedish. Please note that although teaching language is Swedish, parts of the course could be given in English. Examination language is Swedish.
- If teaching language is Swedish/English, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English (depending on teaching language).
- If teaching language is English, the course as a whole is taught in English. Examination language is English.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

Department

Matematiska institutionen

Director of Studies or equivalent

Jesper Thorén

Examiner

Daniel Carlsson

Course website and other links

http://courses.mai.liu.se/Lists/html/index-amne-tm.html

Education components

Preliminary scheduled hours: 50 h
Recommended self-study hours: 110 h

Course literature

Books

Asratian, A, Björn, A, Turesson, B O, (2020) *Diskret matematik* 1 Liber
ISBN: 978-91-47-13358-1