

# Discrete Mathematics

Programme course

6 credits

Diskret matematik

TADI31

Valid from: 2018 Spring semester

**Determined by**

Board of Studies for Computer Science  
and Media Technology

**Date determined**

## Main field of study

Mathematics, Applied Mathematics

## Course level

First cycle

## Advancement level

G1X

## Course offered for

- Computer Engineering, B Sc in Engineering
- Chemistry, Bachelor's Programme

## 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

## 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

### Compendia

Asratian, A., Björn A. och Turesson, B. O., Diskret matematik