Discrete Mathematics

Programme course

6 credits

Diskret matematik

TADI31

Valid from: 2019 Spring semester

Determined by
Board of Studies for Computer Science
and Media Technology

Date determined
2018-08-31

Main field of study
Mathematics, Applied Mathematics

Course level
First cycle

Advancement level
G1F

Course offered for
- Bachelor of Science in Computer Engineering
- Chemistry - Molecular Design, 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