Discrete Mathematics

Diskret matematik
6 credits

Programme course

TADI31

Valid from: 2023 Spring semester

Determined by	**Main field of study**	
Board of Studies for Computer Science and Media Technology	Mathematics, Applied Mathematics	
Date determined	**Course level**	**Progressive specialisation**
2022-08-31	First cycle	G1X
Revised by	**Disciplinary domain**	
	Natural sciences	
Revision date	**Subject group**	
	Mathematics	
Offered first time	**Offered for the last time**	
Spring semester 2018		
Department	**Replaced by**	
Matematiska institutionen		

Course offered for

- Bachelor of Science in Computer Engineering

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

Supplementary courses

The course complements courses in Switching Theory, Programming, Data Structures and Algorithms.

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 could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- 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.

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.

The course is campus-based at the location specified for the course, unless otherwise stated under “Teaching and working methods”. Please note, in a campus-based course occasional remote sessions could be included.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.