Discrete Mathematics

Diskret matematik
6 credits

Programme course

TADI31

Valid from: 2025 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**
2024-08-28	First cycle	G1F
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

The course will provide the conceptual framework and the techniques used within discrete mathematics for applications in program development, theoretical computer science, database theory, digital technology. After completing the course, the student will:

- be able to perform proofs by induction and be able to solve basic problems in integer arithmetic such as Diophantine equations,
- be able to apply the formula language and operations of set theory and be able to structure, formulate and solve combinatorial problems,
- be well acquainted with definitions and basic properties of graphs, and be able to use these for problem solving,
- be familiar with the language of set logic and logical operations and be able to evaluate the validity of logical conclusions and be able to present solutions and use the formulaic language of mathematics correctly.

Course content

1. Number theory; prime numbers, divisibility, Euclid's algorithm, Diophantine equations. Induction and recursion.

2. Sert theory with operations on sets, Venn diagrams and number counting. Combinatorics with permutations and combinations and the binomial theorem.

3. Graphs, trees, algorithms for least expensive networks, modeling and problem solving with graphs. Logic with connectives, truth value tables and methods for inference.

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 such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

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.