



Faculty of Health, Science and Technology  
Mathematics

## Syllabus

### Mathematics for Teachers: Discrete Mathematics

<b>Course Code:</b>	MAGK10
<b>Course Title:</b>	Mathematics for Teachers: Discrete Mathematics <i>Matematik för lärare: Diskret matematik</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

**Major Field of Study:**  
MAA (Mathematics)

#### Course Approval

The syllabus was approved by the Faculty of Health, Science and Technology 2018-08-24, and is valid from the Spring semester 2019 at Karlstad University.

#### Prerequisites

150 ECTS credits, including 30 ECTS credits in mathematics

#### Learning Outcomes

Upon completion of the course, students should be able to:

- apply basic methods and principles in combinatorics,
- use predicate calculus notation and give an account of the relation between propositional calculus and Boolean algebra,
- determine truth tables, disjunctive normal form, conjunctive normal form, and work with Boolean functions,
- give an account of the concept relation and determine if a given relation is reflexive, symmetric, or transitive,
- determine equivalence classes,
- perform modulo operations,
- use Euclid's algorithm to solve Diophantine equations,
- use basic graph theory terminology, and
- apply algorithms treated in the course, for example, Kruskal's algorithm, to solve graph theory problems.

#### Content

The course comprises the following components::

- combinatorics, generating functions
- predicate and set theory logic, Boolean algebra
- relations
- divisibility, modulo operations and Diophantine equations

-introduction to graph theory.

### **Reading List**

See separate document.

### **Examination**

Assessment is based on a written exam.

### **Grades**

One of the grades Fail (U), Pass (G) or Distinction (VG) is awarded in the examination of the course.

### **Quality Assurance**

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

### **Course Certificate**

A course certificate will be provided upon request.

### **Additional information**

The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.

The course MAGK10 cannot be included in the same degree programme as the courses MAGL07, MAGL13, MAGA55 or MAGB63 or any other introduction to discrete mathematics.