



Faculty of Health, Science and Technology
Mathematics

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Health, Science and Technology on 16 January 2014, and is valid from the Autumn semester of 2014 at Karlstad University. It replaces the former syllabus MAGA43 from 2010-02-26.

Course Code: MAGA43

Mathematics for Computer Scientists, 7.5 ECTS Credits
(Matematik för datavetare, 7.5 Swedish credit points)

Degree Level: Bachelor

Progressive Specialisation: G1N (First cycle, has only upper-secondary level entry requirements)

Language of Instruction

The language of instruction is Swedish or English.

Prerequisites

General admission requirements plus upper secondary school Mathematics D or Mathematics 3 c

Major Field of Study

MAA (Mathematics)

Learning Outcomes

The aim of the course is that students acquire the basic skills in algebra and discrete mathematics required in computer science.

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

- use the basic symbols of set theory
- read and interpret mathematical, technical and scientific texts
- determine truth tables for boolean functions and determine the truth value of a logic statement
- simplify logic statements
- mathematically express the negation of a statement
- use divisibility properties for integers
- use the Euclidean algorithm
- determine if a given relation is reflexive, symmetric, anti-symmetric, or transitive
- prove theorems/facts by induction
- determine equivalence classes and perform basic modular arithmetic
- determine if a given graph has an Euler trail
- determine if a given graph is a planar graph
- determine if a given graph has a Hamilton cycle
- determine the minimal spanning tree of a graph
- show understanding of the subject by combining new concepts, theorems and examples and discover analogies and make generalizations

Content and Form of Instruction

Basic logic and set theory. Modular calculations and divisibility properties for integers. Induction and recursion. Relations and functions. Graph theory.

Reading List

See separate document.

Examination

Examination is in the form of a written exam and mandatory assignments. The number of re-examination opportunities is limited to three per academic year.

Grades

One of the grades U (Fail), 3 (Pass), 4 (Pass not without distinction), or 5 (Pass with distinction) 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 assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

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

The course is a required course in the computer science programme.

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