



Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

1MD121 Matematikdidaktik för åk. 7-9 och gymnasiet I, 7,5
högskolepoäng

Mathematics Education for lower secondary and upper secondary
school I, 7.5 credits

Main field of study

Mathematics

Subject Group

Mathematics

Level of classification

First Level

Progression

G1F

Date of Ratification

Approved by the Board of the School of Computer Science, Physics and Mathematics
2011-11-25

The course syllabus is valid from autumn semester 2012

Prerequisites

15 credits mathematics or equivalent.

Objectives

After completing the course students will be able to:

- discern and describe basic characteristics of the teaching profession in relation to the subject matter and subject didactics
- identify and define subject didactic issues related to the activities that the education prepares for
- show in-depth subject knowledge in mathematics relating to lower and upper secondary school and the prerequisites in mathematics needed to mutual understanding
- use school and Mathematics written policy on the development of mathematics teaching content
- describe the mathematical abilities and skills relating to conceptualization, representation, problem solving, communication and reasoning in relation to the mathematics content
- identify the role of language in mathematics, especially regarding conceptualization.

Content

The course begins with a critical discussion around examples selected based on relevance to the national curriculum and syllabi and are discussed in relation to the theoretical framework of abilities/competencies as the basis for syllabus.

The student's math skills in arithmetic, geometry, algebra, functions, probability and statistics relating to mathematics in lower secondary and upper secondary school are deepened and problematized from different didactic perspective.

Mathematics subject nature and historical development are highlighted in a comprehensive, school-oriented perspective.

Mathematical abilities and competencies are treated from a theoretical perspective and then connected to mathematics content and the whole illustrated by orientation around ways and working forms to support concept development and to highlight different strategies for solving problems with a particular focus on the role of language and variety of forms of representation.

Students will solve and construct their own assignment which are then analyzed with regard to the purpose, content, mathematical abilities and developable solution strategies.

Type of Instruction

Teaching consists of lectures, group exercises and mandatory seminars. Part of the program may be online.

Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

The course is examined through active participation in seminars, methodology sessions, and presentations, as well as through oral and written presentations of individual and group assignments, and through written examination/take home exam.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Required Reading

Web:

Andersson, Andreas, Begreppskartor - ett verktyg för bättre förståelse, Nämnaren 2/2002. ncm.gu.se/pdf/namnaren/4447_02_2.pdf

Grevholm, Barbro, Kognitiva verktyg för lärande i matematik- tankekartor och begreppskartor. www.caspar.no/tangenten/2005/barbro_grevholm_1_2005.pdf

Myndigheten för skolutveckling, Mer än matematik.

www.skolverket.se/2.3894/publicerat/2.5006?_xurl_=http%3A%2F%2Fwww4.skolverket.se%3A8080%2Fwtpub%2Fws%2Fskolbok%2Fwpubext%2Ftrycksak%2FRecord%3Fk%3D1891

Niss, Mogens & Højgaard Jensen, Tomas (Red.) (2002). Kompetencer og matematikl ering. Ideer og inspiration til udvikling af matematikundervisning i Danmark. pub.uvm.dk/2002/kom/hel.pdf

Andreas Ryve: Vad  r kunskap i matematik? ncm.gu.se/pdf/namnaren/0709_06_2.pdf

Ola Helenius: Kompetenser och matematik
ncm.gu.se/pdf/namnaren/1115_06_3.pdf

Schoenfeld Allan. (1992). Learning to think mathematically: problem solving, metacognition, and sense making in mathematics.
gse.berkeley.edu/faculty/AHSchoenfeld/Schoenfeld_MathThinking.pdf

Skolverket. Kursplan och betygskriterier för ämnet matematik.

Book:

Bergsten, Christer, Häggström, Johan & Lindberg, Lisbeth (1997). Algebra för alla.

Grevholm Barbro (red.) (2001). Matematikdidaktik – ett nordiskt perspektiv.

Hansen, Hans Christian, Skott, Jeppe & Jess, Kristine. (2009). Matematik för lärare Ypsilon band 1,

Sollervall Håkan, Tal och de fyra räknesätten

Material provided by the department, app 200 pages.

Reference Literature

Umeå PM 199 (om kompetenser): www.mai.liu.se/~chber/kurser/960L09/tolkning.pdf

National Research Council (2001). Adding it up: Helping Children learn mathematics.
www.nap.edu/openbook.php?record_id=9822&page=1

Emanuelsson, Göran, Wallby, Karin, Johansson, Bengt & Ryding, Ronnie (2000).
Matematik – ett kommunikationsämne. Nämnaren Tema, NCM.

Mathematics books of your choice, a book about calculus and a book about algebra. The books have to be at University level.