Linnæus University

Course syllabus

Board of Education Science
School of Computer Science, Physics and Mathematics

1MD318 Matematik och lärande i förskoleklass och de tidiga skolåren, 15 högskolepoäng

Mathematics teaching and learning in preschool class and compulsory school years 1-3, 15 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved by the Board of the School of Computer Science, Physics and Mathematics 2010-02-15

Revised 2010-11-26. Revision made for prerequisites and course evaluation.

The course syllabus is valid from autumn semester 2011

Prerequisites
Teacher's certificate or equivalent.

Expected learning outcomes

On completion of the course, students are able to:

- present a didactic skills as expected learning outcomes for subcourse 1 Teaching and learning in mathematics;
- demonstrate subject knowledge as expected learning outcomes in subcourse 2 Mathematics for preschool and compulsory school years 1-3.

Expected learning outcomes for each subcourse:

Subcourse 1 Teaching and learning in mathematics, 7,5 higher education credits
On completion of the course, students are able to:

- demonstrate knowledge of current theories about how children's early mathematics skills development;
- demonstrate familiarity with the theories of mathematics as a language;
- show how both their own and students' problem-solving skills developed;

- construct mathematical problems taken from students' immediate environment;
- treat mathematical operations involved in pre-school class and the school's previous year taking into account children's different circumstances from the didactic point of view;
- demonstrate the ability to work with the students' understanding of various mathematical concepts
- demonstrate the ability to analyze and evaluate the mathematical content and teaching forms.

Subcourse 2 Mathematics for preschool and compulsory school years 1-3. 7,5 higher education credits
On completion of the course, students are able to:

- demonstrate the ability to independently analyze the mathematics content and methods;
- choose appropriate methods to perform calculations;
- describe the subject of mathematics not only as a stereotypical way of thinking with the rules, but that imagination and creativity are key ingredients to ensure the field structure, development and problem solving methods;
- demonstrate good subject knowledge about the content that is part of mathematics teaching in preschool class and compulsory school years 1-3.

Content

SUBCOURSE 1 Teaching and learning in mathematics 7,5 higher education credits
Child's encounter with mathematics: The role of language. Social and cultural aspects of learning and teaching of mathematics. Children's development related to learning of mathematics. Attitudes towards mathematics and mathematics teaching. Problem solving - Analyzing evolutionary strategies.

Pedagogical and methodological tools in mathematics education for preschool and compulsory school years: Policy document. Analysis of teaching materials. Methods and procedures. Calculators and computers in mathematics teaching. Diagnosis, evaluation and assessment skills.

SUBCOURSE 2 Mathematics for preschool and compulsory school years 7,5 higher education credits.
Knowledge of the basic mathematics of the early school years deepened and inserted into the educational context. Mathematical concepts concrete and their historical development are highlighted.

- Arithmetic: The natural numbers. Positioning System. The four operations of arithmetic. Basic fraction.
- Geometry: Space and time perception. Basic geometric concepts.
- Prealgebra. Pattern.

Type of Instruction

The teaching is carried out in the form of lectures, group discussions, seminars, individual and/or group assignment and field studies. Course work requires participation and commitment.
The students will document and present their own reading and learning orally and in writing. The student must also demonstrate their mastery of that sum, looks and related context and from a scientific approach reflects on the course content.

Assessment varies according to course content. Oral and written presentations, individually and in groups as well as seminar occur.

Grades are given for each subcourse. The course is assessed with one of the grades Pass with Distinction, Pass or Fail. The ratings are compiled and a final will be graded on the whole course 1-15 hec. Less than 9.0 hec with Pass with Distinction gives total grade Pass with Distinction Assessment Criteria for Pass is clear from the expected learning outcomes (see above).

Compulsory attendance is required or occurs during all or part of the course and this is apparent from the respective schedules or study guide.

Examination

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

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

Subcourse 1

Bergius, B. & Emanuelsson, L. 2008. Hur många prickar har en gepard? Unga Elever upptäcker matematik. Göteborg: NCM. ISBN:978-91-85143-07-8.

Johnsen Høines, M. 2000. Matematik som språk. Malmö: Liber.
ISBN 91-47-04670-8.

Malmer, G. 2002. Bra matematik för alla. Lund: Studentlitteratur.
ISBN 91-44-01287-X.

Skolverket. 2003. Lusten att lära – med fokus på matematik. Nationella kvalitetsgranskningarna 2001-2002. Skolverkets rapport nr 221. (Rapporten finns tillgänglig för nedladdning på Skolverkets webbplats.)

Utbildningsdepartementet. 1998. Läroplan för förskolan. Lpfö 98. Stockholm: Skolverket och Fritzes.

Utbildningsdepartementet. 1994. Läroplan för det obligatoriska skolväsendet, förskoleklassen och fritidshemmet. Lpo 94. Stockholm: Skolverket och Fritzes.

- Current curricula in mathematics from the National Agency for Education
- Relevant documents from the National Agency for Education on the objectives, analysis of pupils' skills and diagnoses in Mathematics
- Scientific articles
- Practice Materials

Subcourse 2

Dahl, K. & Nordqvist. S. 1999. Matte med mening. Stockholm: Alfabeta.
ISBN 91 7712 410 3.

Löwing, M. & Kilborn, W. 2003. Huvudräkning, En inkörsport till matematiken. Lund: Studentlitteratur. ISBN 91-44-04225-6.

Persson, A. & Wiklund, L. 2007. Hur långt är ett äppelskal? Tematiskt arbete i förskoleklass. Liber AB. ISBN 978-91-47-05358-2.

- Scientific articles
- Practice Materials

Reference literature
Subcourse 1 och Subcourse 2:
Nämnaren Tema 5. 2002. Uppslagsboken. NCM, Göteborgs Universitet.
ISBN 91-88450-34-1.