



## Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

1MD111 Förskolebarns lärande i matematik, 15 högskolepoäng

1MD111 Preschool children's learning in mathematics, 15 credits

### **Main field of study**

Mathematics

### **Subject Group**

Mathematics

### **Level of classification**

First Level

### **Progression**

G1F

### **Date of Ratification**

Approved by School of Computer Science, Physics and Mathematics 2011-08-17  
The course syllabus is valid from autumn semester 2011

### **Prerequisites**

Teacher certificate or equivalent.

## Objectives

The course is divided into two modules. Module 1 deals mainly with the pedagogical issues of what and why, while Module 2 based on the contents of Module 1 primarily deals with the pedagogical issues of how and why.

### **Module 1**

#### **Preschool children's learning in mathematics. 7.5 credits**

After completing the course the student should:

- be able to interpret the preschool policy documents with focus on content and design for mathematical education, and based on this interpretation draw conclusions for the activities of working with mathematics
- have comprehensive knowledge of mathematics, the character and the history development of ideas
- be able to describe young children's concept development orally and in writing
- be able to describe young children's development of number and spatial awareness orally and in writing
- be able to observe, document and analyze young children's learning in

mathematical contexts

- be able to give an overview of mathematics educational research relevant to preschool children's learning in mathematics
- demonstrate that they master relevant content of mathematics in relation to the work in preschool.

## **Module 2**

### **Preschool's work with mathematics. 7.5 credits**

After completing the course the student should:

- demonstrate the ability to use their knowledge of preschool children's learning of mathematics in didactical situations
- have developed knowledge and ideas for preschool practices in mathematics and independently analyze and evaluate the mathematical content and representation, and the form of education in preschool
- draw conclusions for their own actions based on observations, documentations and analysis of young children's learning in mathematical contexts
- be able to give an overview of mathematics education research relevant to the preschool's work with mathematics

## **Content**

### **Module 1 Preschool children's learning in mathematics**

The module initially focuses and problematizes the role and nature of mathematics in preschool, the character of mathematics and the development of history of ideas(overall) in relation to students' own experience of mathematics. After this the focus is on young children's learning of mathematics regarding concepts, numbers and spatial awareness. The different parts (mathematics, students' math skills, children's learning in mathematics and pre-school activities) interact through the module.

#### **Course content**

- Preschool policy documents in mathematics
- The character of mathematics and the development in history of ideas
- Young children's encounters with mathematics
- Research and theories regarding young children's learning in mathematics
- Young children's concept formation
- Young children's development of number and spatial awareness
- Consideration of mathematics content relevant to the work in preschool.

### **Module 2 Preschool's work with mathematics**

Way to work with mathematics is always linked to a content. That is why the content of Module 1 is a key starting point in the Module 2. Different approaches and opportunities regarding discoveries, learning and representations of mathematics are made visible. Observations of mathematical activities in the preschool are analyzed and used as the basis for evaluation and the improvement of preschool's work with mathematics.

#### **Course content**

- Mathematical and didactical processing of important elements in mathematics in preschool
- Social aspects, cultural aspects and gender dimensions of children's learning of mathematics in preschool

- Research and theories of ways of working in mathematics
- Observation, documentation and analysis of preschool's work with mathematics
- Orientation and strategies regarding the choice of working methods in mathematics in preschool.

## Type of Instruction

Teaching consists of lectures, seminars, laboratory work and field studies. The course can be given as distans learning.

## Examination

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

Both modules of the course are assessed through written and oral exams, performance of independent projects and through active participation in seminars and laboratory work. Part of the examination is practical (field studies) the student will implement and present this. Some assignments are presented with the support of ICT.

For grade pass, the expected learning outcome has to be achieved. For the course grade Pass with Distinction, at least 7.5 credits has to be Pass with Distinction.

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.

## Other

Any additional costs associated with assignments or such is funded by the student.

## Required Reading and Additional Study Material

### Literature list

#### Literature module 1:

Björklund, C. *En, två, många – om barns tidiga matematiska tänkande*. Liber, 2009. 174 pages.

Björklund, C. *Bland bollar och klossar. Matematik för de yngsta i förskolan*. Studentlitteratur, 2008. 193 pages.

Emanuelsson, G. & Doverborg E. (red) *Små barns matematik*, NCM, 2006. 190 pages.

HeidbergSolem, I. & LieReikerås, EK. *Det matematiska barnet*, Natur och Kultur, 2004. 345 pages.

Current steering document for activities in preschool will be added . [www.skolverket.se](http://www.skolverket.se)

Additional articles and other educational materials will be distributed by the department. App. 200 pages.

### Reference literature

Clements, D.H. & Sarama, J. *Learning and Teaching Early Math. The Learning*

*Trajectories Approach*. Routledge, 2009. 327 pages

Sollervall, H. *Tal och de fyra räknesätten*. Studentlitteratur, 2007. pages 172

**Literature module 2:**

*Analysschema för åren före skolår 6*, Skolverket, 2000. 45 pages. [www.skolverket.se](http://www.skolverket.se)

Emanuelsson, G. & Doverborg E. (red) *Små barns matematik*, NCM, 2006. 190 pages.

Emanuelsson, G. & Doverborg, E (red) *Matematik i Förskolan*, Nämnaren Tema NCM, 2006. 109 pages.

HeidbergSolem, I. & LieReikerås, EK. *Det matematiska barnet*, Natur och Kultur, 2004. 345 pages.

Olsson, I. & Forsbäck, M. *Utematte för meningsfullt lärande. Förskoleklass – Skolår 3*. Västerås: Ingrid Olsson ISBN 9197604909 118 pages

Rystedt, E. & Trygg, L. *Laborativ matematikundervisning – vad vet vi?* NCM. 2010 73 pages

Sheridan, S. & Pramling-Samuelsson, I. & Johansson, E. (red) *Barns tidiga lärande. En tvärsnittsstudie om förskolan som miljö för barns lärande*. Göteborgs studies in educational sciences 284 pages. (valda delar) <http://gupea.ub.gu.se/handle/2077/20404>

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