



## Course syllabus

Faculty of Technology

Department of Mathematics

4MD103 Matematiklärarens professionsutveckling, 7,5 högskolepoäng

The professional development of mathematics teachers, 7.5 credits

### **Main field of study**

Mathematics Education

### **Subject Group**

Educational Sciences/Theoretical Subjects

### **Level of classification**

Second Level

### **Progression**

A1N

### **Date of Ratification**

Approved 2013-12-16

Revised 2016-06-15 by Faculty of Technology.

The course syllabus is valid from autumn semester 2016

### **Prerequisites**

Basic eligibility for second level studies and English course B/English 6, teachers certificate with specialization mathematics or equivalent.

## Objectives

After completing the course, the student should both in speech and writing be able to:

- describe and analyze mathematics teaching as a profession
- identify mathematics education issues related to the professional development of mathematics teachers
- describe the relationship between Science and proven experience and its importance as a basis for positioning in mathematics teaching
- identify, evaluate and compare the relevant Science-based knowledge that can form the basis for future development work within the professional role
- advanced ability to identify and relate to students' learning and attitudes towards mathematics related to the mathematics teaching structure
- ability to analyse own and others' professional mathematics teaching role related to core values ??such as ethics, gender, equality and equal treatment
- ability to identify and take responsibility for their own knowledge.

## Content

The course content is divided into four modules:

- research specializations, focusing on mathematics teachers' professional development (beliefs - knowledge - identity)
- models for professional development (e.g. action research, design research, learning study)
- studies of mathematics teachers' professional development
- planning, implementation, observation and analysis of mathematics teaching.

Besides these four modules, information search is included in the course.

## Type of Instruction

The teaching consists of lectures, field studies, seminars and presentations. The teaching is based on the students' active participation, individually and in groups, which requires mandatory attendance at seminars and presentations.

The course is also offered online.

## Examination

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

The examinations consist of written and oral presentations of the reading material and completed assignments and active participation in group discussions.

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 and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed.

## Required Reading and Additional Study Material

Andrews, P. & Rowland, T. (Eds.) (2014). *MasterClass in mathematics education: international perspectives on teaching and learning*. London: Bloomsbury Publishing (Chapter 6 & 8).

Ball, D.L., Thames, M.H. & Phelps, G. (2008). Content Knowledge for Teaching. What Makes It Special? *Journal of Teacher Education*, 59(5), 389-407.

Boaler, J. (1999). Participation, knowledge, and beliefs: A community perspective on mathematics learning. *Educational Studies in Mathematics*, 40, 259-281.

Gellert, U. (2008). Routines and Collective Orientations in Mathematics Teachers' Professional Development. *Educational Studies in Mathematics*. 67(2), 93-110.

Gravemeijer, K. (2004). Learning trajectories and local instruction theories as means of support for teachers in reform mathematics education. *Mathematical Thinking and Learning*, 6(2), 105-128.

Hogden, J. & Askew, M. (2007). Emotion, Identity and Teacher Learning: Becoming a Primary Mathematics Teacher. *Oxford Review of Education*, 33(4), 469-487.

Kazemi, E., & Franke, M.L. (2004). Teacher learning in mathematics: Using student work to promote collective inquiry. *Journal of Mathematics Teacher Education*. 7, 203-235.

Ma, L. (1999). *Knowing and teaching elementary mathematics. Teachers' understanding of fundamental mathematics in China and the United states*. New York: Routledge

Norén, E. (2010). Flerspråkiga matematikklassrum: Diskurser i grundskolans matematikundervisning. Avhandling Stockholms Universitet. (A selection of pages approximately 40, the thesis is available online.)

Olteanu, C., Olteanu, L. (2010). Changing teaching practice and students' learning of mathematics. *Education Inquiry*, 1. 381-397.

Palmer, A. (2010). Att bli matematisk. Matematisk subjektivitet och genus i lärarutbildningen för de yngre åldrarna. Stockholm: Stockholms Universitet. (A selection of pages approximately 40, the thesis is available online.)

Palmér, H. (2013). To become, or not to become, a primary school mathematics teacher.: A study of novice teachers' professional identity development. Avhandling Linnéuniversitetet. (A selection of pages approximately 40, the thesis is available online.)

Potari, D. (2013). The relationship of theory and practice in mathematics teacher professional development: an activity theory perspective, *ZDM Mathematics Education*, 45, 507-519.

Rowland, T., Huckstep, P. & Thwaites, A. (2005). Elementary Teachers' Mathematics Subject Knowledge: The Knowledge Quartet and the case of Naomi. *Journal of Mathematics Teacher Education*, 8(3), 255-281.

Skott, J., Moeskær Larsen, D. & Hellsten Østergaard, C. (2011). From Beliefs to Patterns of Participation –Shifting the Research Perspective on Teachers. *Nordic Studies in Mathematics Education*, 16(1-2), 29-55.

Stronge, J.H.; Ward, T.J. & Grant, L.W. (2011) What makes Good Teachers Good? A Cross-Case Analysis of the Connection Between Teacher Effectiveness and Student Achievement. *Journal of Teacher Education*, 62(4), 339-355.

Additional articles focusing on beliefs, mathematical knowledge or identity is chosen in consultation with the teacher.