Linnæus University

Course syllabus

Faculty of Technology
Department of Mathematical Education

4MD101 Introduktion i matematikdidaktisk forskning, 7,5 högskolepoäng
Introduction to Research in Mathematics Education, 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 2015-03-25 by Faculty of Technology. Objectives, content and literature lists are revised.
The course syllabus is valid from autumn semester 2015

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:

- summarize research in educational sciences, especially mathematics education
- explain how the area of ??knowledge has emerged
- relate to and discuss arguments for research and development in mathematics education
- identify and ask issues in mathematics education that can be empirical or theoretical investigated
- describe the possibilities and limitations, its role in society and the responsibility for its use
- evaluate the importance of research as a basis for position in mathematics education issues

Content
The course content is divided into five parts:

- orientation in mathematics education research field and how the field of knowledge has emerged

- research/development in mathematics education, question formulation, methods and results, and how these relate and lead to relevant and appropriate conclusions
- scientific excellence applied to the mathematics education research field
- analysis of others' empirical studies

Type of Instruction
The teaching consists of lectures, classroom observations, seminars and presentations. The teaching is based to a significant extent on the students' active participation, individually and in groups, which requires mandatory attendance at seminars and presentations.
The course is offered as a distance learning.

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). MaterClass in Mathematics Education. International Perspectives on Teaching and Learning. London: Bloomsbury Publishing

Carpenter, T. P., & Fennema, E. (1996). Cognitively guided instruction: A knowledge base for reform in primary mathematics instruction. The Elementary School Journal, 97 (1), 3-20.

Cobb, P. (1999). Individual and collective mathematical development: the case of statistical data analysis. Mathematical thinking and learning, 1(1), 5-43. doi: 10.1207/s15327833mtl0101_1

Cobb, P., Stephan, M., McClain, K., & Gravemeijer, K. (2001). Participating in classroom mathematical practices. Journal of the Learning Sciences, 10(1/2), 113-163. Gjone, G. (2013). NOMAD - Nordic Studies in Mathematics Eudcation. The First Eight Years, In Grevholm, B., Hundeland, P.S., Juter, K., Kislenko, K. & Persson, P-E. (Eds.), Nordic research in didactics of mathematics: Past, present and future. Cappelen Damm Akademisk. ISBN 978-82-02-39348-9. (pp.182-198).

Kilpatrick, J. (2008). The development of mathematics education as an academic field. In M. Menghini, F. Furinghetti, L. Giacardi, & F. Arzarello (Eds.), The first century of the International Commision on Mathematical Instruction (1908-2008). Reflecting and shaping the world of mathematics education (pp.25-39). Rome: Instituo Enciclopedia Italiana. Fondata da Giovanni Treccani.

Lampert, M. (1990). When the problem is not the question and the solution is not the answer: mathematical knowing and teaching. American Educational Research Journal, 27(1), 29-63. National Council of Teachers of Mathematics. (2000). The principles and standards for school mathematics. Reston, VA: NCTM.

Niss, M. (2007). Reflections on the State and Trends in Research on Mathematics Teaching and Learning. From here to Utopia. In Lester, F. (ed.), Second Handbook of Research on Mathematics Teaching and Learning. Charlotte: NCTM

Niss, M. (2013). Dominant Study Paradigms in Mathematics Education Research - for Better and for Worse. Global trends and Their Impact on Nordic Research, In Grevholm, B., Hundeland, P.S., Juter, K., Kislenko, K. & Persson, P-E. (Eds.), Nordic research in didactics of mathematics: Past, present and future. Cappelen Damm Akademisk. ISBN 978-82-02-39348-9. (pp.395-408)

Sfard, A. (2005). What could be more practical than good research? On mutual relations between research and practice of mathematics education. Educational Studies in Mathematics, 58(3), 393-413.

Skott, J., Jess, K., Hansen, H.C., & Lundin, Sv. (2010). Matematik för lärare & Didaktik. Malmö: Gleerups Utbildning AB.

Skovsmose, O. (1994). Towards a philosophy of critical mathematics education. Dordrecht: Kluwer.

Stylianides, A. J. (2007). Proof and proving in school mathematics. Journal for Research in Mathematics Education, 38(3), 289-321.
Additional literature of maximum 50 pages may be added.