Linnæus University

Jnr: 2014/1316–3.1.2

Course syllabus

Faculty of Technology
Department of Mathematical Education

1GN217 Matematik och matematikdidaktik I, för undervisning i årskurs 4-6, verksamhetsintegrerad profil, 15 högskolepoäng

Mathematics and mathematics education I for teaching in primary school, year 4-6, placement-integrated profile, 15 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1N

Date of Ratification
Approved by Faculty of Technology 2014-08-26
The course syllabus is valid from spring semester 2015

Prerequisites
General entry requirements and English B, Mathematics B, Natural Science A, Civics A. or: Mathematics 2a/2b/2c, Natural Science 1b/1a1+1a2, Civics 1b/1a1 + 1a2

Objectives

Common expected learning outcomes

After completing the course students will be able to:

- discuss and explain the role of the steering documents in mathematics education and through a so-called educational planing show how to work with it in mathematics education
- plan, implement, analyze and evaluate different forms of learning activities for primary school year 4-6 linked to the framework of mathematical skills
- reflect on theories of learning to see the link between skills, mathematics content and methods in mathematics education in year 4-6 and apply this knowledge practically to meet and develop students' abilities and learning
- know and be able to describe stage relevant research from mathematics education which can be related to mathematics instruction in year 4-6.

Otherwise, the objectives for each module are listed below.

Module 1; 7.5 hp
After completing this module the students will be able to:

- based on the core content of the LGR11 for 4-6 demonstrate advanced knowledge of and correctly use basic school mathematics with a focus on arithmetic, numbers and spatial perception, number use, and concepts of mathematics
- apply knowledge of arithmetic, numbers and spatial perception, number use, and concepts in mathematics in didactic activities with a focus on year 4-6
- be able to describe how students in pre-school up to year 3 develop their number perception and be able to build on this knowledge in year 4-6,
- explain how mathematics in year 4-6 is the underlying mathematics of 7-9 with respect to the modules elements
- to account for various factors on students' desire and ability to learn mathematics
- explain and apply different forms of representation and working methods in mathematics presented in this module
- explain overall character of the development of mathematics and the history of ideas for this modules math elements.

Module 2; 7.5 credits
After completing this module the students will be able to:

- based on the core content of the LGR11 for 4-6 demonstrate a thorough knowledge of and be able to use primary school mathematics with a focus on geometry, algebra, statistics, probability, regression and change
- apply knowledge of primary school mathematics with a focus on geometry, algebra, statistics, probability, regression and change in didactic activities with a focus on year 4-6
- describe how preschool up to year 3 mathematics is dealt with in relation to the modules elements and be able to build on this knowledge in year 4-6
- explain how mathematics in year 4-6 is the underlying mathematics of 7-9 with respect to this modules elements
- explain and apply different forms of representation and working methods in mathematics from this modules elements
- explain overall character of the development of mathematics and the history of ideas for this modules math elements.

Content

Module 1

The module addresses the student's own math skills in arithmetic, with a focus on number perception and number usage and concepts and building of concepts in mathematics combined with didactic perspective relevant to activities in year 4-6. The mathematical content discussed in relation to the abilities that form the basis of the primary school curriculum in mathematics. These abilities linked to mathematics content and the whole is highlighted by focusing on different approaches and strategies to support numbers and concept development. It also deals with factors affecting mathematics teaching in school and giving the desire and opportunity to learn mathematics. Mathematics subject characteristics and historical development are highlighted in a comprehensive, school-oriented perspective with a focus on mathematical constructs and ideas. Mathematics education as a research field is illustrated by studies of research articles relevant to primary school mathematics.

Module 2

The module addresses the student's own math skills in geometry, algebra, probability and statistics, regression and change. This knowledge deepens and is used in combination with didactic perspectives relevant to year 4-6. The mathematical content discussed in relation to the abilities that form the basis of the primary school curriculum in mathematics. These abilities are linked to mathematics content and the it is highlighted by focusing on different approaches to support conceptual development and to highlight

different problem-solving strategies with particular focus on the role of language and the variety of forms of representation also addressed factors influencing mathematics teaching in school and giving the desire and opportunity to learn mathematics. Mathematics subject characteristics and historical development are highlighted in a comprehensive, school-oriented perspective with a focus on mathematical constructs and ideas. Mathematics education as a research field is illustrated by studies of research articles relevant to primary school mathematics.

Professional base and professional progression

The course prepares the student for upcoming workplace training period and the objectives are formulated for this. During each module the students are trained in a didactic approach based on course content and policy documents based on what, how and why. Questions about the teacher's role, learning situations, material selection and adaptation of work is actualized and further processed in conjunction with the field studies and placement-integration.

Scientific approach and scientific progression
During the course the students get a basic knowledge of the subject and the subject didactics scientific traditions and theoretical concepts. Furthermore, students should be able to find research results with relevance to the area and for the profession. The student will, under supervision, collect, process and make easier the analysis of empirical data and from this produce a simple report with a scientific disposition.

Type of Instruction
The course is conducted through lectures, seminars, methodology sessions and practical sessions. Placement-integrated sections and field study days are included. Teaching always requires mandatory attendance.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
The course is assessed partial through active participation in seminars, method meeting and presentations, partial through written and oral presentations of individual and group assignments, and partial through written examination/home exam.

To receive a passing grade (G) the objectives has to be achieved. To receive Pass with Distinction (VG) on the course the student has to get the grade Pass with Distinction (VG) on both modules.

Students who do not pass the regular examination will be offered a second examination within six weeks during the regular semester periods.

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
After completing the course, is a course evaluation compiled and written feedback to the students. The statement recognized for the current institutional bodies and for the relevant Programme Board, and filed by the course coordinator department.

Other
The course is included in the primary teacher program.

Required Reading and Additional Study Material
Required Reading
Literature which is used in both modules

Häggblom, Lisen. *Med matematiska förmågor som kompass*. Lund: Studentlitteratur

Malmer, Gudrun . *Bra matematik för alla: nödvändig för elever med inlärningssvårigheter* (latest edition). Lund: Studentlitteratur

Skolverket. *Läroplan för grundskolan, förskoleklassen och fritidshemmet 2011* www.skolverket.se/publikationer?id=2575

Compendium and scientific articles, app 200 p. .

Module 1
Myndigheten för Skolutveckling. Mer än matematik- om språkliga dimensioner i matematikuppgifter. (46 p). www.skolverket.se/publikationer?id=1891

Skolverket. Rapport 2009:5: *Undervisningen i matematik- utbildningens kvalitet och ändamålsenlighet* (28 p) www.skolinspektionen.se/Documents/Kvalitetsgranskning/Matte/granskningsrapport-matematik.pdf

Sollervall, Håkan. *Tal: och de fyra räknesätten* (senaste upplagan). Lund: Studentlitteratur

Module 2
Hagland, Kerstin, Hedrén, Rolf & Taflin, Eva. *Rika matematiska problem: inspiration till variation* (latest edition). Stockholm: Liber

Bråting, Kajsa, Sollervall, Håkan & Stadler, Erika. Geometri för lärare(latest edition). Lund: Studentlitteratur

Referenslitteratur
Löwing, Madeleine & Kilborn, Wiggo. *Huvudräkning: en inkörsport till matematiken* (latest edition). Lund: Studentlitteratur