Linnæus University

Course syllabus

Board of Education Science

School of Computer Science, Physics and Mathematics

2GN002 Matematik och matematikdidaktik II, för undevisning i förskoleklass och åk 1-3, 15 högskolepoäng

2GN002 Mathematics and mathematics education II for teaching in primary school, directed towards pre-school class and year 1-3, 15 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G2F

Date of Ratification
Approved by School of Computer Science, Physics and Mathematics 2012-08-17
The course syllabus is valid from spring semester 2013

Prerequisites

- 1GN001 The history of education, its value base and social conditions, pre-school class and primary school, year 1 to 6; 7.5 credits
- 1GN003 UVK-course: Development and Learning for Primary Teachers; 7.5 credits
- 1GN010 UVK-course: Social relations, Conflict Management and Leadership, Primary Teachers; 7.5 credits and
- Specialization year 1-3: 1GN009 Work-based education in primary school, Pre-school class and years 1-3; 7.5 credits. Specialization year 4-6: 1GN012 Work-based education in primary school, years 4-6, period I; 7.5credits
- passed module 1, 7.5 credits in course 2GN001

Objectives
Common objectives for the course

After completing the course, students will:

- be able to discuss and explain the role of the steering documents in mathematics education and to show how to work with them in mathematics education
- plan, implement, analyze and evaluate different forms of learning activities for primary school (pre-school up to year 3) linked to the framework of mathematical skills
- be able to reflect on theories of learning to see the relationship between skills, mathematics content and methods in mathematics education in pre-school up to year 3 and put this knowledge into practice to meet and develop students' skills and thereby their learning
- know and be able to describe stage relevant research from mathematics education can be related to mathematics instruction in pre-school up to year 3.

Otherwise, the objectives for each module are listed below.

Module 1, 7.5 hp
After completion of this module, students should be able to:

- analyze math tasks for purpose, content, knowledge, solution strategies, and critical aspects of student learning
- interpret goals and grading criteria for mathematics in primary school (pre-school up to year 6), with an emphasis on pre-school up to year 3 and their impact on teaching and assessment of student performance
- analyze teaching and pupils' solutions of mathematical tasks and construct assignments and exams based goals for learning
- identify, document and assess students' knowledge and be able to analyze students' knowledge developing in mathematics.

Module 2, 7.5 hp
After completion of this module, students should be able to:

- describe how different students' math skills for concepts, representation, problem solving, communication and reasoning can be expressed in combination with different mathematics content, with an emphasis on mathematics content in pre-school up to year 3
- demonstrate knowledge and application of simple exercises to show how mathematical abilities may develop in students through a variety of content and working methods
- demonstrate an ability to use a variety of learning environments and working methods, including ICT, to support and challenge all pupils' learning in mathematics.

Content
Module 1
The course begins with an in-depth look at the policy documents, especially goals and grading criteria for primary school mathematics with emphasis on pre-school up to year 3, as a starting point for understanding the primary school-specific conditions and practice. Their own mathematics knowledge from 2GN001 is further developed by both solving and constructing their own task from a given mathematical content. Based on their own mathematics and mathematics for pre-school up to year 3 the module consists of studies and analysis of students' solutions to mathematical tasks, teaching materials analysis, and analysis of mathematical tasks for the purpose, content, mathematical knowledge and developable solution strategies. Analysis of data and students solutions includes identification and assessment as a basis for the documentation of the student's

knowledge and to support the student's continued knowledge development. Identification, assessment and grading of students' knowledge of mathematics discussed in the in-depth understanding of the relationship between skills and mathematics content and in relation to the current goal.

Module 2
The course aims to deepen students 'ability to customize the content and approach in order to meet, challenge and develop all students' mathematical abilities, which includes a special educational perspective (individual, group, organization) are highlighted. Mathematics teaching as a phenomenon is addressed from different classroom perspectives (eg, student, teacher, communication, democracy, motivation, gender, ethnicity) and deepened through the study of scientific articles.

Professional base and professional progression
The course prepares the student for upcoming workplace training period and the objectives are formulated for this. Questions about the teacher's role, learning situations, material selection and adaptation of work from the course 2GN001 is deepened and further processed in conjunction with field studies. The focus is on how the subject content and how teaching can be tailored to students' individual circumstances and how the documentation and assessment of students knowledge of the subject can be adapted.

Scientific approach and scientific progression
Throughout the course the students get an in-depth knowledge of the subject and subject didactic 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 be able to understand and manage various research methods (observation, interview and questionnaire) and under supervision collect, process and make easier 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. Field study days may be included. The 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. Some of examinations are practical elements (field studies) that the student implements and presents. Teaching arrangements requires mandatory attendance.

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

Ahlberg, Ann & Wallby, Karin. *Matematik från början* (latest edition). Göteborg: Nationellt centrum för matematikutbildning, Univ.

Doverborg, Elisabet, Doverborg, Elisabet & Emanuelsson, Göran. *Små barns matematik: erfarenheter från ett pilotprojekt med barn 1 - 5 år och deras lärare* (latest edition). Göteborg: NCM, Göteborgs universitet

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

McIntosh, Alistair. *Förstå och använda tal: en handbok* (latest edition). Göteborg: Nationellt centrum för matematikundervisning (NMC), Göteborgs universitet

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

Module 1
Pettersson, Astrid. *Bedömning av kunskap: för lärande och undervisning i matematik* (latest edition). Stockholm: Institutionen för matematikämnets och naturvetenskapsämnenas didaktik, Stockholms universitet

Analysschema i matematik för åren före skolår 6, Lärarhögskolan i Stockholm. PRIM-gruppen. 1. uppl. (2000). Stockholm: Skolverket (44 p)
Available: www.skolverket.se/publikationer?id=2219

Delkurs 2
Jess, Kristine, Skott, Jeppe & Hansen, Hans Christian. *Matematik för lärare. My, Elever med särskilda behov* (latest edition). Malmö: Gleerups

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

Mönks, Franz J.. *Att se och möta begåvade barn : [en vägledning för lärare och föräldrar]*, Franz J. Mönks, Irene H. Ypenburg (latest edition). Natur och Kultur.

Rystedt, Elisabeth & Trygg, Lena. *Laborativ matematikundervisning: vad vet vi?* (latest edition). Göteborg: Nationellt centrum för matematikutbildning, Göteborgs universitet. Available on the web: ncm.gu.se/media/ncm/dokument/laborativ_mat_und.pdf

Sterner, Görel & Lundberg, Ingvar. *Läs- och skrivsvårigheter och lärande i matematik* (latest edition). Göteborg: Nationellt centrum för matematikutbildning, Göteborgs universitet Tillgänglig på Internet: ncm.gu.se/node/468

Compendium and scientific articles, app 100 p.