Linnæus University

Jnr: UGA 2013/1594–3.1.2

Course syllabus

Faculty of Technology
Department of Mathematical Education

1GN042 Matematik och matematikdidaktik II, för undervisning i årskurs 4-6, 15 högskolepoäng

Mathematics and mathematics education II for teaching in primary school, directed towards year 4-6, 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 2013-08-19
The course syllabus is valid from spring semester 2014

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 planning 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
- be able to reflect on theories of learning to see the relationship between skills, mathematics content and methods in mathematics education in year 4-6 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 primary school year 4-6.

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 year 4-6 and their impact on teaching and assessment of student performance
- analyze teaching and pupils' solutions of mathematical tasks and construct assignments and exams based on 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 year 4-6
- 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 year 4-6, as a starting point for understanding the primary school-specific conditions and practice. Their own mathematics knowledge from 2GN003 is further developed by both solving and constructing their own tasks from a given mathematical content. Based on their own mathematics and mathematics for year 4-6 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 2GN003 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 adopted.

Scientific approach and scientific progression
Throughout the course the students get 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. Teaching alwys 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

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

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

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

Compendium and scientific articles, app 200 p.

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)
Länkadress: www.skolverket.se/publikationer?id=2219

Hodgen, Jeremy; William, Dylan.
Mathematics inside the black box : bedömning för lärande i matematikklassrummet (latest edition). Stockholms universitets förlag.

Module 2

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

Pettersson, Eva & Wistedt, Inger.
Barns matematiska förmågor - och hur de utvecklas(latest edition).
Lund: Studentlitteratur

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

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

Boaler, Jo. *Elefanten i klassrummet: - att hjälpa elever till ett lustfyllt lärande i matematik* (latest edition). Liber