Linnæus University

Dnr: 2014/538–3.1.3

Course syllabus

Faculty of Technology

Department of Mathematics

2MD57U Matematik och matematikdidaktik, för undervisning i årskurs 1-3, (16-30 hp). Ingår i Lärarlyftet II., 15 högskolepoäng

2MD57U Mathematics and Mathematics Education, teaching in year 1-3 (16-30 credits), 15 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved by Faculty of Technology 2014-03-04
The course syllabus is valid from autumn semester 2014

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 (pre-school up to year 3) 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 pre-school up to year 3 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 pre-school up to year 3.

Otherwise, the objectives for each module are listed below

Module Assess and grading knowledge in mathematics, 7.5 credits
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 Special needs in mathematics, 7.5 credits
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 Assess and grading knowledge in mathematics, 7.5 credits
The course begins with an in-depth review of 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 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 objectives.

Module Special needs in mathematics, 7.5 credits
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 During the modules the students are trained in a didactic approach based on the course content and policy documents on the basis of what, the how and why. Questions about teacher role, learning situations, material selection and adaptation of work is actualized and processed further in conjunction with field studies.

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

Distance teaching is possible. When given as a distance course special forms of distribution are used appropriate for the method of teaching.

To attend this course you need a field study class or group of pupils.

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. To receive a passing grade (G) the objectives has to be achieved.

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

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 by the coordinating department.

Credit Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course: The course overlaps 1MD133 and 1MD143 with 7,5 credits, 1MD134 and 1MD144 with 7,5 credits and Module 3 and 4 in 1MD130 and 1MD140.

Required Reading and Additional Study Material

Required reading

Module 1

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

Analysschema i matematik för åren före skolår 6 / Lärarhögskolan i Stockholm. PRIM-gruppen. (latest edition). Stockholm: Skolverket
www.skolverket.se/publikationer?id=2219

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

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

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

In addition compendiums and scientific articles approximate 100 pages.

Module 2
Myndigheten för Skolutveckling. Mer än matematik- om språkliga dimensioner i matematikuppgifter. (46 p). www.skolverket.se/publikationer?id=1891

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

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

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 utvecklass. (latest edition). Lund: Studentlitteratur

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

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

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