Linnæus University

Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

GU7111 Matematikdidaktisk breddning för verksamhet i grundskolans tidiga år, 30 högskolepoäng

GU7111 Didactics of mathematics intended for the Lower Level of the Compulsory School, 30 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1N

Date of Ratification
Approved 2009-12-15
Revised 2012-03-30 by School of Computer Science, Physics and Mathematics.
Expected learning outcomes, content and literature list is revised.
The course syllabus is valid from autumn semester 2012

Prerequisites
General entry requirements for university studies.

Objectives

Having completed the course the student is expected to be able to:

- analyse observed situations based on the curriculum, course syllabus, grade criteria, and national tests, as well as draw conclusions based on their own actions as teachers
- present the pupils' concept development and demonstrate an ability to utilise this knowledge in didactical contexts
- master basic calculation element in the fields arithmetic, algebra and geometry
- demonstrate an ability to analyse and critically deal with mathematical contents in a teaching material
- demonstrate an ability to deal with important elements in mathematics based on the pupils' general understanding
- present some historical contexts in which the concept mathematics has been

developed and utilised
- examine and analyse mathematical textbooks and teaching aids that are used as educational tools in the school subject mathematics
- examine and analyse software programmes used as educational tools in the school subject mathematics
- be able to plan and carry out teaching in matehamtics from an outdoor educational perspective
- be able to use different outdoor environments in order to work with pupils` understanding of number and space,geometry, algebra and statistics for year F-6

Content

The specialisation comprises four sub courses. For more information see each course syllabus.

Module 1 1MD301 7.5 credits
Pupils' learning and concept development in mathematics
The course consists of:

- pupils' concept development in mathematics
- mathematics as a language: conversations – interviews – reasoning
- interpretations of pupil solutions
- strategies for the choice of and orientation in work methods
- promotion of pupils' interests for mathematics
- pupils' understanding – from the concrete to the abstract
- knowledge assessment: curriculum, course syllabus, grade criteria, and national tests
- the concept of numbers from a historical perspective
- analysis of calculation skills: tables, algorithms, mental arithmetic and the calculator
- social and cultural aspects on learning and teaching mathematics.

Module 2 1MD303 7.5 credits
Mathematics and teaching
The course consists of:

- mathematical- and didactical approaches to numbers and the four rules of arithmetic, geometry and algebra
- the logical structure and construction of mathematical theory.

Module 3 1MD311 7.5 credits
Mathematical didactic – mathematics from the start
The course consists of:

- young children's understanding of numbers and rooms
- work methods in nursery schools and preschools
- starting school with a focus on mathematics
- didactical approach to important elements in mathematics for the primary years
- analyses of teaching aids and computers in teaching
- learning mathematics from a gender perspective.

Module 4 1MD316 7.5 credits
Working with Mathematics outdoors
The course consists of:

- didactical use of number in the fundamental rules of arithmetic, geometry, statistics and algebra
- ways and means of working in the teaching of mathematics focusing on outdoor activities
- different environments in which pupils can learn mathematics.

Type of Instruction
Teaching consists of lectures, seminars and methodology sessions. The student's active participation is an important part of the teaching, individually and in groups, which requires attendance at seminars, methodology sessions and presentations.
This course is also offered as a distance tuition course.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

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.

The course is examined through active participation at seminars, methodology sessions and presentations, as well as through a written exam and written and verbal presentations of individual tasks and group assignments.

Course Evaluation
A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Other
Having completed the training the student will receive a degree certificate upon request from the Graduation Office at the Division of Student Affairs.

Students who successfully complete the course may download a course certificate through the Student Portal. Otherwise the may request a course certificate from the school secretary.

Required Reading and Additional Study Material
Sub course 1
Emanuelsson, G m fl (red), *Matematik –ett kommunikationsämne*. Nämnaren Tema, NCM. Göteborgs universitet, 1996. Pages 150 (selection).
Emanuelsson, G m fl (red), Tidskriften *Nämnaren* NCM. Göteborgs universitet. current year.
Kilborn W & Löwing L, *Baskunskaper i matematik*. Studentlitteratur, 2002. Pages 250 (selection).
PRIM-gruppen, *Analysschema i matematik för tidiga skolår*, Skolverket, 2003. Pages 62.
PRIM-gruppen, *Bedömning av kunskap- för lärande och undervisning i matematik*, ISBN:978-91-7656-670-1. 104 pages.
Undervisningen i matematik – utbildningens innehåll och ändamålsenlighet,

Skolinspektionen rapport 2009:5, 2009, www.skolinspektionen.se 27 pages.
Kompendiums, DFM, Linnæus University, current year. Pages app. 300.

Sub course 2

DFM, *Stencils*, Linnæus University, current year. Pages app. 300.
Sollervall, H, *Tal och de fyra räknesätten*, Studentlitteratur, 2007. Pages 172.
Emanuelsson, G. m.fl. (red.), *Algebra för alla*, Nämnaren Tema, NCM, Göteborgs universitet, 1997. Pages 150(164).

Sub course 3

Emanuelsson, G m fl (red), *Matematik –ett kommunikationsämne*,Nämnaren Tema, NCM. Göteborgs universitet, 1996. Pages 50 (211).
Emanuelsson, G m fl (red), *Matematik från början*, Nämnaren Tema, NCM. Göteborgs universitet, 2000. Pages 247.
Emanuelsson, G m fl (red), Tidskriften *Nämnaren* NCM. Göteborgs universitet. current year.
Kilborn W & Löving M, *Baskunskaper i matematik*, Studentlitteratur, 2002. Pages 130 (372).
PRIM-gruppen, *Analysschema i matematik för tidiga skolår*, Skolverket 2003. Pages 62.
Compendiums, from DFM, Linnæus University, current year. Pages app. 100.

Sub course 4

Lundegård, Wikman, Wohlin (red.), Utomhusdidaktik. Studentlitteratur, latest edition. Pages 204 (204).

Molander, K m fl. Att lära in matematik ute, Naturskoleföreningen,latest edition. Pages 135 (135).www.naturskola.se.

Olsson & Forsbäck, Utematte för meningsfullt lärande förskoleklassskolår 3, JUST NU, latest edition. Pages 118 (118). mattemediamix@hotmail.com.

DFM, Distributed material, DFM,Linnæus University, current year. Pages app. 100.