



**GENERAL CURRICULUM FOR EDUCATION AT POST-GRADUATE LEVEL
IN
MATHEMATICS EDUCATION**

**Special Board for Teacher Education
2007-09-18**

The English name of the research subject has been changed to Mathematics Education from Mathematics and Learning (no. 2491-11, Vice chancellor 2012-09-04)

1 Subject area

Mathematics education covers the study of in-school and out-of-school practices for teaching, learning and doing mathematics, including research that is directed towards studying the social, economic and political conditions and consequences of those practices. Mathematics education is an interdisciplinary research area that draws on a wide range of theories from the humanities and social sciences.

2 Programme curriculum

Education at post-graduate level in Mathematics Education that concludes with a licentiate degree comprises a total of two years' full time study (120 higher education credits) and consists of a study programme that gives 30-60 higher education credits and a licentiate thesis that gives 60-90 higher education credits.

Education at post-graduate level in Mathematics Education that concludes with a doctorate comprises a total of four years' full time study (240 higher education credits) and consists of a study programme that gives 60-120 higher education credits and a doctoral thesis that gives 120-180 higher education credits.

The education in Mathematics Education aims to give the student in-depth knowledge in Mathematics and Mathematics Education and such knowledge in other subjects that is of importance in research in the field of Mathematics Education. The students shall also develop knowledge in independently planning, conducting and publishing research findings and critically reviewing and evaluating existing research findings. After completion of the education, the student shall be able to participate in world-class research projects, disseminate research findings and be able to interact with players at different levels in the education system.

An individual study programme is drawn up for every post-graduate student (according to a fixed model) where the study programme is specified in detail. The individual study programme is followed up at least once a year by the post-graduate student and his/her supervisor and is then approved by the head of department, as delegated by the faculty board.

3 Eligibility and selection

3.1 General eligibility requirements

As specified in Section 39 of Chapter 7 of the Higher Education Ordinance and the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.



3.2 Specific eligibility requirements

Main subject/main area Mathematics, 60 credits/90 higher education credits at basic level.

Good skills in oral and written communication in Swedish and/or English.

For applicants who achieved basic eligibility before 1 July 2007: no examination requirements.

3.3 Selection

As specified in Section 41 of Chapter 7 of the Higher Education Ordinance and the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.

For selection for education at post-graduate level in Mathematics Education the following selection criteria apply:

- Knowledge relevant to the project in question
- The quality of the applicant's degree project
- Knowledge of empirical research methods in the social sciences is an additional qualification
- Personal qualities relevant to education at post-graduate level.

4 Examinations included in the education

The education consists of courses and an academic thesis. Examinations included in post-graduate programmes are graded Pass or Fail. Course and licentiate thesis grades are decided by specially appointed teachers (examiners). Doctoral thesis grades are decided by a specially appointed grading committee.

4.1 Courses

The courses in the programme shall include general courses and courses specific to the thesis and depend on the post-graduate student's prior knowledge. The courses are chosen in consultation between the student and his/her supervisor and are specified in individual study programmes. The courses may in certain cases be studied at another department or another university. The following courses should be included, unless the student possesses equivalent previous knowledge:

- Courses that deal with central concepts and directions in research in mathematical didactics
- Course in research methodology in mathematical didactics
- Thesis-specific courses in mathematical didactics or mathematics
- Course in statistics and experiment design

Goal attainment is tested by means of the form of examination specified in the syllabus.

4.1.1 Recognition of prior studies

As specified in the local guidelines laid down in the Admission Rules for Post-graduate Education at Luleå University of Technology.



4.2 Academic thesis

An academic project in the form of a dissertation/thesis in Mathematics Education shall be presented as a homogenous, cohesive academic work (monograph) or a brief summary – comprehensive summary – of academic essays (composite thesis) that the post-graduate student has written alone or together with another person or persons.

Thesis manuscripts shall be presented at one or more research seminars or be subjected to equivalent review through the agency of the department.

The licentiate thesis is defended orally at a public licentiate seminar and is graded Pass or Fail. When the thesis is graded both the content of the thesis and the defence of the thesis are taken into consideration. The grade of a licentiate thesis is decided by an examiner appointed by the head of department.

The doctoral thesis is defended orally at a public disputation and is graded Pass or Fail. When the thesis is graded both the content of the thesis and the defence of the thesis are taken into consideration. The grade of a doctoral thesis is decided by a grading committee that is appointed for each thesis.

5 Degree

In Mathematics and Learning, a post-graduate student who has been admitted to doctoral studies has the possibility to take a licentiate degree after completing a portion giving at least 120 higher education credits of the education that will be concluded with a doctorate.

5.1 Degree objectives

As specified in the degree description (Higher Education Ordinance, Appendix 2 – Degree Ordinance. See also the appendix below.

For a licentiate degree in Mathematics Education the following additional objectives apply:

- demonstrate necessary skills and knowledge as regards the evaluation and development of teaching materials for teaching Mathematics and Numeracy and have the ability, knowledge and skills to develop and teach courses in Mathematics and Learning at basic level.

For a doctorate in Mathematics Education the following additional objectives apply:

- demonstrate ability to develop criteria for evaluating and producing teaching materials and syllabuses for teaching Mathematics and Numeracy and have the ability, knowledge and skills to develop and teach courses in Mathematics Education at advanced level.

5.2 Degree title

A post-graduate student who takes a licentiate degree in Mathematics Education receives the degree title of Licentiate in Philosophy.

A post-graduate student who takes a doctorate in Mathematics Education normally receives the degree title of Doctor of Philosophy.

Requests for another degree title are made according to established guidelines.



6 Entry into effect and interim regulations

The previous general curriculum will cease to apply for post-graduate students who are admitted to education at post-graduate level after 1 July 2007. Post-graduate students admitted before this date may choose to either follow the previous curriculum or transfer to the present curriculum.



THIRD LEVEL QUALIFICATIONS

Objectives (Higher Education Ordinance, SFS 1993:100)

1. Knowledge and understanding

For a degree of Licentiate (Licentiatexamen), 120 HE credits, research students must

- demonstrate knowledge and understanding in the field of research, including current specialist knowledge in a defined part of the field and a deeper knowledge of scientific methods in general and of methods in the specific field of research in particular.

For a degree of Doctor (Doktorsexamen), 240 HE credits, research students must

- demonstrate broad knowledge in and a systematic understanding of the field of research, together with deep and up-to-date specialist knowledge in a defined part of the field of research; and
- demonstrate familiarity with scholarly methods in general and with methods in the specific field of research in particular.

2. Skills and abilities

For a degree of Licentiate, 120 HE credits, research students must

- demonstrate an ability to identify and formulate issues, critically, independently and creatively, and proceeding with scientific precision; to plan a limited research project and other advanced tasks and to carry them out using appropriate methods within specified time limits, so as to contribute to the development of knowledge; and to evaluate this work;
- demonstrate an ability to clearly present and discuss research and research results in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts; and
- demonstrate the skills required to independently participate in research and development work and to work independently in other advanced contexts.

For a degree of Doctor, 240 HE credits, research students must

- demonstrate an ability to engage in scholarly analysis and synthesis and in independent, critical examination and assessment of new and complex phenomena, issues and situations;
- demonstrate an ability to identify and formulate issues, critically, independently and creatively, and proceeding with scientific precision, and to plan and, using appropriate methods, conduct research and other advanced tasks within specified time limits, and to scrutinise and evaluate such work;
- demonstrate, in a dissertation, their ability to make a substantial contribution to the development of knowledge by their own research;
- demonstrate an ability to present and discuss research and research results with authority, in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts;
- demonstrate an ability to identify their need of further knowledge; and



- demonstrate a potential to contribute to the development of society and support other people's learning, both in the field of research and education and in other advanced professional contexts.

3. Judgement and approach

For a degree of Licentiate, 120 HE credits, research students must

- demonstrate an ability to make ethical assessments in their own research;
- demonstrate insight into the possibilities and limitations of science, its role in society and people's responsibility for how it is used; and
- demonstrate an ability to identify their need of further knowledge and to take responsibility for developing their knowledge.

For a degree of Doctor, 240 HE credits, research students must

- demonstrate intellectual independence and scholarly integrity and an ability to make ethical assessments relating to research; and
- demonstrate deeper insight into the potential and limitations of scholarship, its role in society and people's responsibility for how it is used.

4. Scholarly essay

For a degree of Licentiate, 120 HE credits,

- research students must have received a passing grade on a scholarly essay worth at least 60 higher education credits.

For a degree of Doctor, 240 HE credits,

- research student must have received a passing grade on a scholarly dissertation (doctoral dissertation) worth at least 120 higher education credits.