Linnæus University

Dnr: LNU-2023/4333

Course syllabus

Faculty of Technology

Department of Mathematics

5MA41E Examensarbete på masternivå, 30 högskolepoäng
5MA41E Master's Thesis, 30 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
Second Level

Progression
A2E

Date of Ratification
Approved 2015-05-22
Revised 2023-11-30 by Faculty of Technology. Prerequisites are revised.
The course syllabus is valid from spring semester 2024

Prerequisites
4MA451 Research Methodology, 7.5 credits, or the equivalent. In addition, at least 60 credits in mathematics on advanced level.

Objectives

After completing the course, the student should be able to:

1. demonstrate knowledge and understanding, and insight into current research in the field of the thesis
2. critically, independently and creatively identify and formulate issues and to plan and adequate methods carry out advanced tasks including evaluation of the work within the specified time limits
3. verbally present and discuss their own and others results in dialogue with different groups
4. present in writing and discuss their own and others' results in accordance with accepted scientific practices in mathematics
5. ability to identify their need of further knowledge and to take responsibility for its development
6. insert the obtained results in a larger mathematical or applied context

- work independently with methods and theory development in an area of mathematics and be able to explain mathematical theory building and various mathematical proof techniques

or

- independently apply mathematical theories and mathematical methods
- show good ability to describe realistic problems with mathematical models and analyze these models analytically and numerically
- use and analyze mathematical and numerical software suitable for mathematical applications.

Content

Each student is appointed a supervisor and examiner. The student in consultation with the supervisor and examiner formulates a project, in a recent mathematical subject. The student will carry out this project. This usually means that the student is studying scientific texts, applying mathematical methods and obtain their own results. The work is presented in a written report tailored to accepted scientific practice in mathematics and presented and discussed at a seminar.

Type of Instruction

Lectures, seminars and tutoring

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student’s performance is assessed as fail (i.e. received the grade F).

The grades on the thesis are set by appointed examiners after consultation with the supervisor. The examiner and the supervisor should not be the same person.

Assessment Criteria
Five general criteria are the base for the examiners assessment:

A. Knowledge and understanding
B. Planning and Implementation
C. Results, analysis and interpretation
D. Oral presentation and communication
E. Written presentation.

In the assessment process, the student's ability to use their own initiative independently move the project forward and to keep the set time frames are considered.

The examiner gives the grade to be awarded according to the scale:
0 - Nonexistent
1 - Unsatisfactory
2 - Sufficient
3 - Good
4 - Excellent.

The final grade is a combination of the five criteria. For grade E according to the ECTS

scale the student must receive at least grade Satisfactory (2) in all the assessment criteria.

Explanation of assessment criteria
The complete objectives that has to be achieved are presented above under Objectives.

A. Knowledge and understanding (Objectives 1 and 7)
The student will demonstrate a deeper understanding of the selected task and its scientific context and purpose. The student should be able to work independently with methods and theory development in an area of mathematics and be able to explain mathematical theory building and various mathematical proof techniques or independently apply mathematical theories and mathematical methods with mathematical modeling and numerical simulation.

B. Planning and Implementation (Objective 2)
The student will demonstrate the ability to plan and use appropriate methods to implement the selected task and be able to demonstrate the ability to critically, independently and creatively identify and formulate sub problems. Independence, initiative, creativity and the ability to keep time frames should be considered in the assessment. For criterion also includes the student's ability to evaluate their work in the paper and in discussion with the supervisor and examiner. The student's logbook can be a support for the assessment.

C. Results, analysis and interpretation (Objectives 5 and 6)
The student should be able to process and analyze the results obtained with mathematical or numerical methods. The student should be using the available literature to put the results into a larger mathematical or applied context. Independence, initiative and creativity should be considered in the assessment as well as the ability to identify their need of further knowledge.

D. Oral presentation and communication (Objectives 3)
The student will demonstrate the ability to adapt the oral presentation to the target group, to make it interesting and clearly structured. The content must be correct and both the text and image to be interpretative for all audiences. The time frame should be held. The student will demonstrate the ability to maintain contact with the audience and be able to answer questions clearly and discuss the results. For this criterion also includes the student's ability to orally communicate and discuss their findings during the work and to adapt to a scientific mode of expression and the ability to communicate with different audiences. This includes opposition on other students' work.

E. Written presentation (Objectives 4)
The purpose of the work and its scientific context, as well as the findings and conclusions, should be clearly stated in a coherent written report that will be suited to the accepted scientific practice in mathematics. The presentation should be linguistically correct, clear and logical and easy to read and interesting. There must also be a popular scientific description of the work in Swedish, if students have mastered the language, or English about half an letter size page.

Resit examination is offered in accordance with Linnaeus University’s Local regulations for courses and examination at the first- and second-cycle levels.
In the event that a student with a disability is entitled to special study support, the examiner will decide on adapted or alternative examination arrangements.

Course Evaluation

A course evaluation should be conducted during the course or in connection with its conclusion. The results and analysis of the completed course evaluation should be promptly communicated to students who have completed the course. Students participating in the next course instance should be informed of the results of the previous course evaluation and any improvements that have been made, no later than at the start of the course.

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: 5MA11E Master's Thesis, 30 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

The student selects suitable literature for the specific field of study in consultation with the supervisor and the examiner.