Linnæus University

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Course syllabus

Faculty of Technology
Department of Mathematics

2MA41E Examensarbete på kandidatnivå, 15 högskolepoäng
Degree project at bachelor level, 15 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G2E

Date of Ratification
Approved by Faculty of Technology 2015-05-22
The course syllabus is valid from spring semester 2016

Prerequisites
2MA151 Mathematics, science and society, 2MA101 Ordinary differential equations and 2MA105 Algebraic structures I and at least one of the courses 1MA164 Cryptography and kodning, 1MA221 Introductoty finance mathematics and 2MA107 Mathematical physics

Objectives

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

1. demonstrate knowledge and understanding, and on a broad base present current research in the field of the thesis
2. independently, identify, formulate and carry out tasks within the specified time limits
3. verbally present and discuss the results in dialogue with different groups
4. present in writing and discuss the result 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. relate the obtained results in a mathematical or applied context

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

or

- apply mathematical theory building 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 a passing grade the objectives has to be achieved. 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 an understanding of the selected task and its scientific context and purpose. The student should be able to work with methods and theory development in an area of mathematics and be able to explain mathematical theory building and various mathematical proof techniques or 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 independently identify and formulate sub problems. Independence, and the ability to keep time frames should be considered in the assessment. 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.

Course Evaluation
During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap
This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: 2MA11E Degree project at bachelor level, 15 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.