Faculty of Science

MATM37, Mathematics: Ordinary Differential Equations 2, 7.5 credits

Matematik: Ordinära differentialekvationer 2, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2020-05-17 to be valid from 2020-05-17, spring semester 2021.

General Information

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Mathematics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The overall goal of the course is that the students should aquire in-depth knowledge in ordinary differential equations and the ability to apply this to problems from other sciences. The purpose is further to develop the students' ability to solve problems and communicate mathematical reasoning.

Knowledge and understanding
After completing the course the student should be able to:

- explain in depth the concepts, theorems and methods included in the course,
- explain the theory behind the methods introduced in the course,
- identify the the most important theorems in the course and present their proofs.

Competence and skills

After completing the course the student should be able to:

- integrate knowledge from the different parts of the course in connection with problem solving,
- identify problems that can be solved by methods that are part of the course and solve these using appropriate solution methods,
- describe the solution to a mathematical problem within the course framework, in speech and writing, logically coherent and with adequate terminology,
- plan and carry out relevant assignments for the course using appropriate methods within a given time frame.

Judgement and approach

After completing the course the student should be able to:

- argue for the importance of ordinary differential equations as a tool in other areas, e.g. physics.

Course content

The course treats:

- Boundary value problems;
- Sturm-Liouville theory and eigenfunction expansions;
- Autonomous systems;
- Phase portraits. Stability theory;
- Periodic solutions. Chaos.

Course design

The teaching consists of lectures and seminars. A compulsory assignment is included in the course.

Assessment

The examination consists of a written examination and an oral examination at the end of the course as well as a written assignment during the course. The oral examination may only be taken by those students who pass the written examination. Students who fail the regular written and oral examination, respectively, are offered a re-examination shortly thereafter.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the course it is required to pass the written examination, the oral examination and the written assignment. In addition, the grade Pass with distinction requires that the total number of points obtained in the written and the oral examination is at least 75% of the maximum total number of points. The maximum number of points that can be obtained in the written and the oral examination are weighted five to two.

Entry requirements

For admission to the course, English B / 6 as well as at least 90 credits in pure mathematics, including the course MATC12, Ordinary Differential Equations 1 or equivalent courses.

Further information

The course may not be included in a degree together with MATM27 Ordinary Differential Equations 2, 7.5 credits.

Subcourses in MATM37, Mathematics: Ordinary Differential Equations 2

Applies from V21

2101   Written Examination, 5,0 hp
         Grading scale: Fail, Pass
2102   Oral Examination, 2,0 hp
         Grading scale: Fail, Pass
2103   Assignment, 0,5 hp
         Grading scale: Fail, Pass