



LUND
UNIVERSITY

Faculty of Science

MATP31, Mathematics: Distribution Theory, 7.5 credits

Matematik: Distributionsteori, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2020-06-09 to be valid from 2020-06-09, spring semester 2021.

General Information

The course is an elective course for second-cycle studies for a degree of Master of Science (120 credits) in mathematics.

Language of instruction: English

Main field of studies

Mathematics

Depth of study relative to the degree requirements

A1F, Second cycle, has second-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to give an introduction to distribution theory, which is an important tool for the theory of partial differential equations. 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 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 use an appropriate solution method,
- describe the solution to a mathematical problem within the course framework, in speech and writing, logically coherent and with adequate terminology.

Judgement and approach

After completing the course the student should be able to:

- argue for the importance of distribution theory as a tool for other subject areas, for example partial differential equations and theoretical physics, and discuss its limitations.

Course content

The course treats:

- The foundations of distribution theory.
- Test functions, the concept of a distribution, distributions with compact support, operations on distributions, convolution, homogeneous distributions and the Fourier transform.

Course design

The teaching consists of lectures and seminars.

Assessment

The examination consists of a written examination and an oral examination at the end of the course. The oral examination may only be taken by those students who pass on the written examination. Students who fail the regular written respectively oral examination 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 and the oral. 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

To be admitted to the course, English 6/B is required and at least 90 higher education credits in mathematics, including knowledge equivalent to the courses MATB24 Linear Analysis, 7.5 credits and MATM12 Analytic Functions, 15 credits.

The courses MATM36 Topology, 7.5 credits, MATM38 Fourier Analysis, 7.5 credits, and MATM39 Integration Theory 7.5 credits, are recommended but not compulsory.

Further information

The course may not be included in a higher education qualification together with the course MATP11 Distribution theory 7.5 credits.

Subcourses in MATP31, Mathematics: Distribution Theory

Applies from V21

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