MMA340   Analytic Number Theory, 7.5 credits

Analytisk talteori, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2018-06-25 to be valid from 2018-06-25, spring semester of 2019.

Field of education: Science 100%
Department: Department of Mathematical Sciences

Position in the educational system

The course can be part of the following programme: 1) Mathematical Sciences, Master's Programme (N2MAT)

Main field of studies	*Specialization*
Mathematics	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of *MMG700* Analytic Functions. The course *MMG100* Elementary Number Theory is recommended but not required.

Learning outcomes

On successful completion of the course the student will be able to:

- give important examples of arithmetic functions and describe their basic properties, including their relation to Dirichlet series,
- describe the basic theory of the Riemann zeta function, Dirichlet characters and Dirichlet L-functions,
- use the methods of the course to analyze examples, solve problems and prove theorems on the level of the course,

- give (at least the outlines of) the proofs of the main results of the course.

Course content

Arithmetic functions. Dirichlet series. The Riemann zeta function (analytic properties and zeroes). Elementary methods of studying the distribution of prime numbers among the integers. The prime number theorem with applications. Dirichlet characters and Dirichlet L-functions. The prime number theorem for arithmetic progressions.

Form of teaching

Language of instruction: English

Assessment

The examination consists of written assignments and a written or oral examination at the end of the course. During the course, there may be optional assignments that give bonus points on the exam. Examples of such assignments are small written tests, labs, and oral or written presentations. Information about this is found on the course home page.

If a student, who has failed the same examined component twice, wishes to change examiner before the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22 of Higher Education Ordinance).

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Course evaluation

The course is evaluated with an anonymous questionnaire and/or a discussion with the student representatives. The results of and possible changes to the course will be shared with students who participated in the evaluation and students who are starting the course.

Additional information

For a list of course literature, see:
https://www.chalmers.se/sv/institutioner/math/utbildning/grundutbildning-goteborgs-universitet/kurslitteratur/Sidor/Kurslitteratur-i-matematik.aspx