



DEPARTMENT OF MATHEMATICAL SCIENCES

MMA330 Commutative Algebra, 7.5 credits

Kommutativ algebra, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Mathematical Sciences on 2018-02-12 to be valid from 2018-07-01, autumn semester of 2018.

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

Mathematics

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

General entry requirements and the equivalent of 90 credits in mathematics, including the course *MMG500 Algebraic Structures*.

Learning outcomes

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

- describe the prime ideals in $\mathbb{Z}[X]$,
- give the basic results about Noetherian rings and modules,
- describe the relation between finite and integral ring extensions,
- form rings of fractions of arbitrary commutative rings,
- describe and characterize discrete valuation rings.

Course content

Prime ideals in polynomial rings. Modules over commutative rings. Noetherian rings and modules. Hilbert's basis theorem. Finite and integral ring extensions. Rings of fractions and localisation. Discrete valuation rings.

Form of teaching

Language of instruction: English

Assessment

There will be a written 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>

The syllabus for MMA330 was originally established to take effect from 2007-12-01, when it replaced MAM760, and was revised 2009-12-17.