



Commutative Algebra and Algebraic Geometry, MM7042 SYLLABUS FALL 2021

NOTE: The official syllabus can be found on the official course website below.

COURSE WEBSITE: <https://kurser.math.su.se/course/view.php?id=1074>

INSTRUCTORS: Tim Hosgood (tim.hosgood@math.su.se) and Luca Schaffler (lucsch@math.kth.se)

EXAMINER: Dan Petersen (dan.petersen@math.su.se)

TA'S: Stephan Reppen (stephan.reppen@math.su.se) and Vahid Shahverdi (vahidsha@kth.se)

LECTURE: Th 9:15-11:00 on Zoom. Meeting ID and password are available on the course website.

DISCUSSION SECTION: Th 11:15-12:00 in the same Zoom room as the lecture.

TEXTS:

(1) *Algebraic Geometry* by Andreas Gathmann. Available for free at the following webpage

<https://www.mathematik.uni-kl.de/~gathmann/class/alggeom-2019/alggeom-2019.pdf>

(2) Selected parts *Undergraduate Commutative Algebra* by Miles Reid.

COURSE DESCRIPTION: Introduction to commutative algebra and algebraic geometry. We will study the interplay between the algebraic properties of polynomial equations and the geometric properties of the corresponding set of solutions. The topics include, but not limited to, affine varieties, ideal-variety correspondence, Zariski's topology, Noetherian rings, modules, rings of fraction, sheaves, regular functions, morphisms, varieties, projective varieties, Grassmannians, birational maps.

PREREQUISITE: An introductory algebra course about groups and rings.

ATTENDANCE POLICY: Prompt, complete attendance is expected at all classes. Please attend the ENTIRE class; this is to preserve an effective learning environment for all students. Professional courtesy toward your instructors and your classmates is expected. You will be responsible for all the materials delivered in class and your final grade can be affected by it.

TEST DATE: The final oral exam will be held on Zoom and in person on January 12, 14, and 17. For information about the oral exam, please refer to the course webpage.

GRADING: There is a total of 180 points. 80 points come from the bi-weekly homework. The remaining 100 points come from the final oral exam. Note that students will need at least of 40 points on the final oral exam to pass the course. The grading scale can be found in the course website. There is no rounding-up of grades in this course.

HOMEWORK GUIDELINES: There will be homework due every two weeks on Thursday at 13:00. There are no make ups for homework. There are no extensions on the homework. Please see the course webpage for the homework policy.

RE-EXAM: There will be a re-exam on February 10, following the same format as the ordinary oral exam. If you wish to sign up for the re-exam, please send an e-mail to Tim and Luca by February 4 at the latest.

REMARKS: Questions are always encouraged. Please contribute as a positive member of this learning community. See the Academic Calendar for holidays and deadlines.

(<https://www.kth.se/en/student/studier/schema/lasarsindelning/2021-2022-1.988583>)

(<https://www.su.se/english/education/student-support/term-dates>)

ACADEMIC HONESTY POLICY: All academic work must meet the standards contained in the Academic Honesty Policy

(<https://www.kth.se/en/student/stodkontakt/stod/fusk-1.997287>)

(<https://www.su.se/english/education/student-support/your-rights-and-responsibilities?open-collapse-boxes=>).

Students are responsible for informing themselves about those standards before performing any academic work. This policy defends the academic integrity of all student work and will be uniformly applied to all students in the class.

ACADEMIC ACCOMMODATION: If you have a documented (learning) disability, you should contact the disability services at your respective institution (links below).

<https://www.kth.se/en/student/stodkontakt/stod/funktionsnedsattning/funka-1.953214>

<https://www.su.se/english/education/student-support/studying-with-a-disability>

DISCLAIMER: The course syllabus is a general plan for the course; deviations announced to the class by the instructor may be necessary. It is the responsibility of the student to seek clarification of the grading policy and/or course requirements and procedures from the instructor.