

Course content for International Master program „Mathematical modeling, computation and optimization“

Course name	Algebraic Geometry
Contents and Objectives	<p><u>Content:</u></p> <ul style="list-style-type: none"> • Basics of commutative algebra • Affine and projective varieties • Dimension theory • Divisors and linear systems • Primary Decomposition • Curves and Surfaces • Theorems of Bézout and Riemann-Roch • Sheaves and their cohomology • Applications to number theory and representation theory <p><u>Objectives of the course:</u> The course gives a comprehensive introduction to the theory of affine and projective varieties and their geometry. It provides basics on commutative algebra and leads to applications in number theory and representation theory as well as in other topics that are treated in more specialised courses.</p>
Teaching	<p>This course consists of lectures and exercise classes.</p> <ul style="list-style-type: none"> • Lecture: Algebraic geometry (4h/week) • Exercise class: Algebraic geometry (2h/week)
Prerequisites	Basic notions of Linear Algebra and Higher Algebra
Examination	Oral exam (30 minutes)
Credits	8 ECTS points
Frequency	This course is given at least every second year.
Workload	The estimated total working time for this course is 240 hours.
Duration	This course is given during one semester.

