

Suggested curriculum in Algebraic Geometry

Responsible: Prof. Tadeusz Winiarski

1st year

title	kind of activity	hours/week	hours/year	form of crediting	Credits
General School Seminar	seminar	2	60	participation	4
Seminar	seminar	2	60	participation	6
Mathematical Analysis	lecture, classes	2 2	60 30	exam	12
Functions Of One Complex Variables	lectures	2	60	exam	8
Commutative Algebra	lectures	2	60	exam	8
Functions Of Several Complex Variables	lectures	2	30	exam	5
Algebraic Geometry	lectures	2	30	exam	5
Polynomial Mappings	lectures	2	30	participation	3
Algebraic Topology	lectures	2	30	exam	5
Tutorials	tutorial	2	60	as arranged with tutor	4

2nd year

title	kind of activity	hours/week	hours/year	form of crediting	Credits
General School Seminar	seminar	2	60	participation	4
Seminar	seminar	2	60	participation	6
Algebraic Geometry	lectures	2	30	exam	5
Analytic Geometry	lectures	2	30	exam	4
Gröbner Bases	lectures	2	60	exam	7
Tutorials	tutorial	2	60	as arranged with tutor	4
Diploma project	individual work	10	300	diploma exam	30

Mathematical Analysis (advanced calculus). Differential calculus in Banach spaces, function sequences and series, the Riemann integral, differential forms, integration of differential forms and Stokes' theorem, additional topics: the Riemann-Stieltjes integral, Lebesgue measure and integration, functions spaces, Fourier series, tempered distribution and Fourier transforms.

Responsible: Assoc. Prof. Robert Wolak

Commutative Algebra. Rings, spectra of rings, modules and algebras, tensor products, flatness, noetherian and artinian rigs and modules, integral extensions of rings, valuation rings and Dedekind domains, completions of rings and modules, regular local rings, Cohen-Macaulay rings and modules.

Responsible: Prof. Kamil Rusek

Algebraic Geometry. Affine algebraic sets, correspondence between ideals of the ring of polynomials and algebraic sets, Zariski topology, coordinates ring, rational functions, projective spaces, projective varieties, grassmann manifolds, Zariski topology, regular and biregular mappings, rational and birational mappings, foundation of the theory of intersection and Bezout Theorem.

Responsible: Prof. Tadeusz Winiarski

Analytic Geometry. Complex manifolds and holomorphic functions. The Weierstass Preparation Theorem. Analytic and locally analytic subsets of complex manifolds. Projections of analytic sets, the Remmert Theorem. Singularities, dimension and irreducibility of analytic sets. Local and global structure of analytic sets. Holomorphic mappings on analytic sets and analytic spaces.

Responsible: Prof. Piotr Tworzewski

Gröbner Bases. Algorithms of Gröbner bases, effective methods of algebraic geometry.

Responsible: Prof. Tadeusz Winiarski

Polynomial Mappings. Chevalley theorem, polynomial automorphisms, injective morphisms, the Jacobian Conjecture (reduction of degree, equivalent formulation) and related topics.

Responsible: Prof. Ludwik M. Drużkowski