אוניברסיטת
בן-גוריון בנגב

The Department of Mathematics

2020–21–A term

Course Name Introduction to Algebraic Geometry

Course Number 201.1.6171

Course web page
`https://www.math.bgu.ac.il//en/teaching/fall2021/courses/introduction-to-algebra`

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Office Hours `https://www.math.bgu.ac.il/en/teaching/hours`

Abstract

Requirements and grading[1]

Course topics

.1 Affine and projective spaces, affine and projective maps, Segre and Veronese embeddings, Desargues's Theorem, Pappus's Theorem, cross-ratio, projective duality

.2 Plane curves: rational curves, linear systems of curves, conics and the Butterfly Theorem, Pascal's Theorem, Chasles's Theorem, the group structure on a planar cubic, Bezout's Theorem

.3 Affine algebraic varieties: Hilbert's Basis Theorem, Zariski topology, irreducible components, Hilbert's Nullstellensatz, the correspondence between the ideals and the algebraic sets, morphisms and rational maps between affine algebraic varieties

.4 Projective varieties: graded rings and homogeneous ideals, the projective correspondence, morphisms, blow-ups, birational equivalence and rational varieties, Grassmannians

.5 The basics of dimension theory

.6 The basics of smoothness

[1] Information may change during the first two weeks of the term. Please consult the webpage for updates

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.7 Cubic surfaces and 27 lines. If time permits, other topics will be discussed such as abstract algebraic varieties, Chevaley's Theorem, Riemann-Roch Theorem and its applications.