Green, Mark L.
Generic initial ideals. (English) Zbl 0933.13002
Elias, J. (ed.) et al., Six lectures on commutative algebra. Lectures presented at the summer school, Bellaterra, Spain, July 16–26, 1996. Basel: Birkhäuser. Prog. Math. 166, 119-186 (1998).

This is a semi-expository article (with many new proofs of known results) on generic initial ideals which began as course notes for a course given at UCLA (University of California, Los Angeles) and was later given as a series of lectures at the Recerca Matemática Summer School in Commutative Algebra during the summer of 1996 in Barcelona.

Besides the introduction, the article consists of six chapters: (1) The initial ideal; (2) Regularity and saturation; (3) The Macaulay-Gotzmann estimates on the growth of ideals, (4) Points in $\mathbb{P}^2$ and curves in $\mathbb{P}^3$, (5) Gins ("generic initial ideals") in the exterior algebra; and (6) Lexicographic gins and partial elimination ideals.

Each chapter ends with some short comments for students. According to the author these notes are "a strange brew of commutative algebra, geometry, and combinatorics, with a little bit of non-commutative algebra thrown in for good measure". Some of the topics included are monomial ideals, gins, Galligo's theorem, Eliahou-Kervaire's theorem, Hilbert's syzygy theorem, the Bayer-Stillman theorem on the regularity of an ideal I, Macaulay's estimate on growth of ideals, the hyperplane restriction theorem, Gotzmann's persistence theorem, Gotzmann's regularity theorem, results of Ellia-Peskine and Gruson-Peskine, the Hilbert-Burch theorem, Laudal's lemma, Macaulay's bound for exterior ideals, and the Kruskal-Katona theorem.

For the entire collection see [Zbl 0892.00031].

Reviewer: D.D.Anderson (Iowa City)

MSC:

13A15	Ideals and multiplicative ideal theory in commutative rings
14A05	Relevant commutative algebra

Cited in **6** Reviews
Cited in **91** Documents

Keywords:

generic initial ideals