1125-13-3031 **Paul Baginski*** (pbaginski@fairfield.edu), Fairfield University, Department of Mathematics, 1073 North Benson Rd., Fairfield, CT 06824, and **Gregory Knapp**, **Jad Salem** and **Gabrielle Scullard**. *Nonunique factorization in the ring of integer-valued polynomials.*

The ring of integer-valued polynomials $\mathrm{Int}(\mathbb{Z})$ is the set of polynomials with rational coefficients which produce integer values for integer inputs. Specifically,

$$\mathrm{Int}(\mathbb{Z}) = \{f(x) \in \mathbb{Q}[x] \,|\, \forall n \in \mathbb{Z}\, f(n) \in \mathbb{Z}\}.$$

$\mathrm{Int}(\mathbb{Z})$ constitutes an interesting example in algebra from many perspectives; for example, it is a natural example of a non-Noetherian ring. It is also a ring with nonunique factorization: given $f(x) \in \mathrm{Int}(\mathbb{Z})$, there can be multiple ways to write $f(x)$ as a product of irreducible integer-valued polynomials. Not only can we have $f(x) = a_1(x) \cdots a_n(x) = b_1(x) \cdots b_m(x)$, for different irreducibles $a_i(x)$ and $b_j(x)$, we can have different numbers of irreducible factors, i.e. $n \neq m$. Thus, an element $f(x)$ can have different factorization lengths n. Frisch recently demonstrated that in $\mathrm{Int}(\mathbb{Z})$, you can find an element $f(x)$ that has any factorization lengths you desire and you can even prescribe the number of factorizations of each length. The polynomials constructed in this way have high degree. We give a graded analysis, determining the possible elasticities and catenary degrees for a polynomial of bounded degree. (Received September 20, 2016)