In this talk we will provide a brief overview of how the theory of factorization in integral domains generalizes to factorization in commutative rings with zero divisors. Of particular interest is how certain factorization properties behave with respect to the polynomial extension $R[X]$, where $R$ is an arbitrary commutative ring. For example, if $R$ is an integral domain, it is well known that $R$ is a unique factorization domain (UFD) if and only if $R[X]$ is a unique factorization domain. This result does not hold if we generalize to polynomial rings with zero divisors. We will focus on several types of unique factorization rings with zero divisors and characterize when a polynomial ring over an arbitrary commutative ring has unique factorization. (Received August 19, 2018)