We consider mean squared estimation with lookahead of a continuous-time signal corrupted by additive white Gaussian noise. We show that the mutual information rate function, i.e., the mutual information rate as function of the signal-to-noise ratio (SNR), does not, in general, determine the minimum mean squared error (MMSE) with fixed finite lookahead, in contrast to the special cases with 0 and infinite lookahead (filtering and smoothing errors), respectively, which were previously established in the literature. Further, we investigate the simple class of continuous-time stationary Gauss-Markov processes (Ornstein-Uhlenbeck processes) as channel inputs, and explicitly characterize the behavior of the minimum mean squared error (MMSE) with finite lookahead and signal-to-noise ratio (SNR). We extend our results to mixtures of Ornstein-Uhlenbeck processes, and use the insight gained to present lower and upper bounds on the MMSE with lookahead for a class of stationary Gaussian input processes, whose spectrum can be expressed as a mixture of Ornstein-Uhlenbeck spectra.