The overall goal of this talk is to apply the theory of Goodwillie calculus to the category $\text{Alg}_O$ of algebras over a spectral operad. Its first part will deal with generalizing many of the original results of Goodwillie so that they apply to a larger class of model categories and hence be applicable to $\text{Alg}_O$. The second part will apply that generalized theory to the $\text{Alg}_O$ categories. The main results here are: an understanding of finitary homogeneous functors between such categories; identifying the Taylor tower of the identity in those categories; showing that finitary $n$-excisive functors can not distinguish between $\text{Alg}_O$ and $\text{Alg}_{O_{\leq n}}$, the category of algebras over the truncated $O_{\leq n}$; and a weak form of the chain rule between such algebra categories, analogous to the one studied by Arone and Ching in the case of Spaces and Spectra.