We describe basic notions of functional random elements and the space of functions $L^2[0,1]$. We discuss the non-existence of a probability density functional and the requirements for integrating in a functional space. In Chapter 2, we define distribution functionals and introduce a goodness-of-fit test which utilises them. The concept of characteristic functionals follows in Chapter 3, along with the latest test for Gaussianity of functional random elements. We conclude the chapter with our own new goodness-of-fit test, where we prove the distribution of its test statistic under the alternative, then under the null hypothesis, and lastly the distribution of the bootstrapped test statistic. Finally, we illustrate the theory on a simulation study of the empirical significance level and power of the goodness-of-fit tests.