Presented thesis deals with analysis of functional data. In the first part, problem which arises because of only finite possible numbers of observations is discussed. This problem is solved using representation by basis functions with emphasis on B-splines basis. The second part is focused on functional principal component analysis that could be understood as a natural extension of a multivariate case or as an application of Karhunen-Lo`eve expansion , which is based on Mercer's theorem. Estimations of principal components together with rates of convergence are mentioned too. Practical computation of principal components is mentioned in the last chapter.