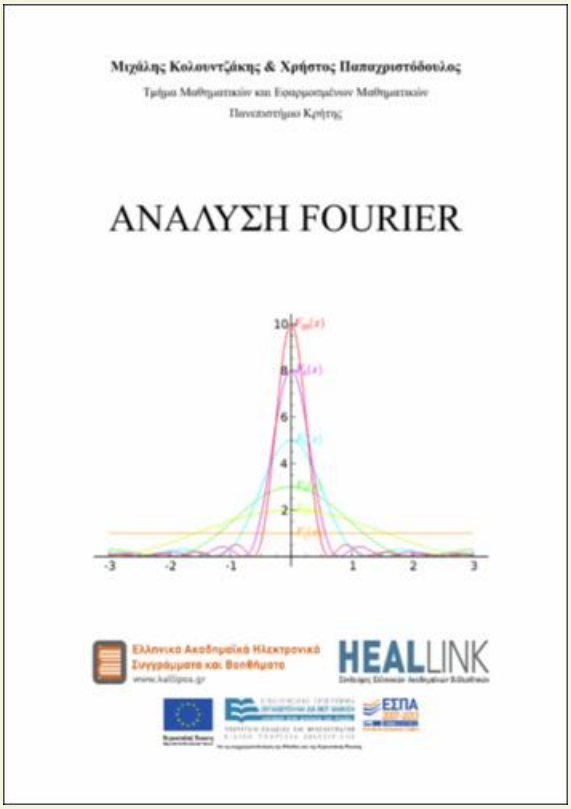

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Abstract

This Fourier Analysis book is intended to cover a semester-long undergraduate course in what is commonly called classical Fourier analysis with an emphasis on periodic functions (Fourier analysis on the circle, as we usually say). At the undergraduate level, one cannot usually rely on knowledge of Lebesgue measure and integration and one usually relies on the Riemann integral, a choice which is rewarded with several, otherwise unnecessary, technicalities in the presentation and also with modifications of proofs which look very unnatural. For these reasons, we have opted for the first chapter of the book to be a quick introduction to Lebesgue measure and integration, without most technical proofs (which one sees when taking a regular course on Lebesgue measure) but with an emphasis on how to use the integral and acquaintance with the < > properties and the good behaviour of the Lebesgue integral are the reasons for which it is used. The desired result of the first chapter is, in other words, for the student to learn to use the Lebesgue integral without necessarily having gone through its strict foundation (hence the title < >). We hope that this user manual can be useful in other analysis courses as well or courses in differential equations, beyond Fourier analysis. The book covers the basic concepts of the Fourier series with the central question the question of the convergence of the Fourier series of a function to the function itself.

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