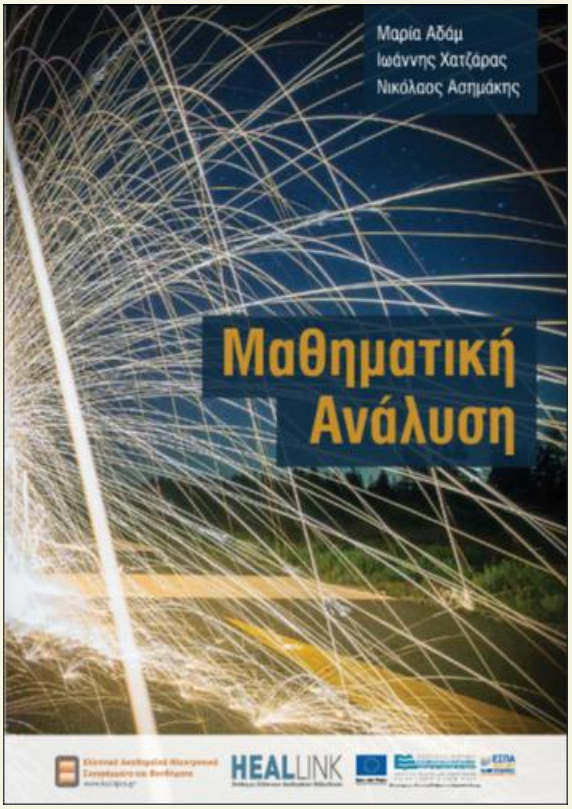

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Abstract

The proposed book includes the mathematics material taught as Mathematical Analysis I or Calculus of functions of a real variable or Mathematics I, in the early semesters of the Departments of the Schools of Science, of the Schools of Engineering, Economic and Social Schools, as well as Schools of Technological Applications in Technical Educational Institutes (TEI). It is intended for undergraduate students as a primary textbook and for graduates as a useful electronic reference book. In its content the reader can find material related to: • The calculus and the study of a real-valued function of a real variable, • The indefinite, definite, and generalized integrals and their applications, • The sequences of real numbers, • The series of real numbers and functions. The book attempts to present the theoretical structure and methodology of Mathematical Analysis in a systematic and simple way, with precision and completeness, assuming that the concepts of sequences, limits, continuity, derivatives and integrals are known from high school. The aim is to provide an easy-to-use reference for the material on the calculus of functions of a real variable and to ensure understanding of the fundamental concepts of differential and integral calculus, which serve as a foundation for other undergraduate courses such as Signals and Systems, Digital Signal Processing, etc. To achieve this, the material is strictly formulated, with Definitions, Theorems, and Propositions, without lengthy proofs, and its presentation is supported by selected examples and applications. Additionally, to facilitate the assimilation of the terms of Mathematical Analysis, the book leverages the knowledge and capabilities provided by the technological advancement of computers, through writing programs using computational algebra software (Mathematica/Matlab/Octave). Each chapter includes: • theory, • examples and applications with references to the theory via links, • unsolved exercises with answers for self-assessment, • bibliography and formula sheet.

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