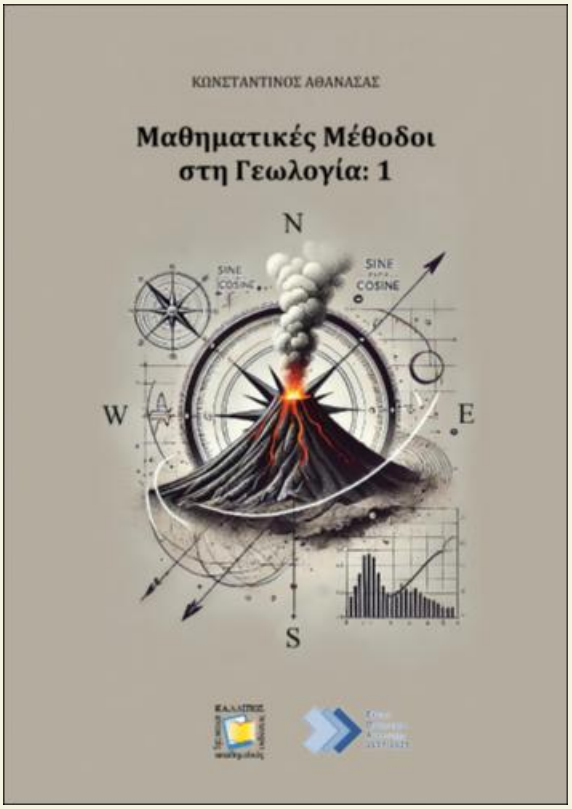

METADATA

Title: Mathematical Methods in Geology: 1

Other Titles: -

Language: Greek

Authors: Athanasas, K., Professor, NTUA

ISBN: 978-618-228-317-2

Subject: NATURAL SCIENCES AND AGRICULTURAL SCIENCES

Keywords: Mathematical methods / Geology / Statistics / Linear algebra / Fourier analysis

Bibliographic Reference: Athanassas, K. (2025). Mathematical Methods in Geology: 1 [Undergraduate textbook]. Kallipos, Open Academic Editions. http://dx.doi.org/10.57713/kallipos-1066

Abstract

The aim of the book "Mathematical Methods in Geology: 1" is to introduce geological students and professionals to quantitative approaches in their field. Traditionally, geology has been viewed as a qualitative, observational science, but the book argues that mathematical methods provide objectivity and reliability to geological interpretations. The book is structured into three main sections: statistics, linear algebra, and Fourier analysis. In the statistics section, concepts such as probability and data distributions are covered to help geologists analyze data rigorously. The linear algebra section focuses on spatial relationships and structural analysis, while the Fourier analysis section introduces frequency-based techniques for interpreting geological data, such as cyclic sedimentation patterns and topography. Throughout the book, practical geological examples are provided, illustrating how mathematical methods can enhance the understanding of geological processes and formations. Emphasis is placed on the balance between mathematical rigor and geological intuition, ensuring that numerical results align with real-world observations. The aim of the book is to fill a gap in Greek geological education, providing a resource that connects geological phenomena with mathematical modeling. Overall, it is a comprehensive guide designed to equip geologists with the mathematical skills necessary for both academic and professional pursuits.

The Project is funded by the National Development Programme 2021-2025 of the Ministry of Education and Religious Affairs and implemented by the Special Account for Research Funds of the National Technical University of Athens and the Hellenic Academic Libraries Link.