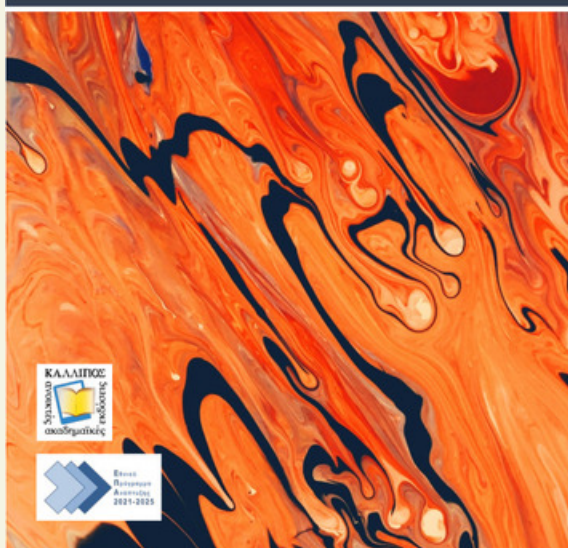


ΑΡΙΣΤΕΙΔΗΣ Α. ΜΠΛΟΥΤΣΟΣ

## ΕΙΣΑΓΩΓΗ ΣΤΗΝ ΠΕΡΙΒΑΛΛΟΝΤΙΚΗ ΥΔΡΑΥΛΙΚΗ



## METADATA

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**Authors:** Bloutsos, A., Assistant Professor, UNIWA

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### Abstract

This book was created to be used as a basic textbook by undergraduate and graduate students dealing with the science of Environmental Engineering. It includes hydraulic engineering topics focusing on the environmental field. The material of the book is divided into eight chapters. The book begins with an introduction to the principles of water pollution and the formulation of the basic definitions and parameters related to environmental mass transfer processes and is followed by Chapter 2 describing the fundamental model of complete mixing, including the solutions for various cases of flow and pollutant loads. In Chapter 3, Fick's law of diffusion is formulated and the solution of the one-dimensional diffusion equation is presented for various cases of initial and boundary conditions. Also, the effect of boundaries is examined. The chapter concludes with the formulation of the one-dimensional advection - diffusion equation and its solution for various cases of initial and boundary conditions. In Chapter 4, the one-dimensional advection - diffusion equation is applied in the case of natural

streams. In Chapter 5, the deoxygenation and reaeration mechanisms in natural streams are described and the Streeter-Phelps water quality simulation model is developed. Chapter 6 includes the description of the wastewater disposal mechanisms in water bodies. Chapter 7 describes water quality processes in lakes and reservoirs, focusing on the quantitative relationships that describe flow and dispersion, sedimentation, and thermal stratification. Finally, in Chapter 8 the basic principles of the process of sediment transport in natural streams with reference to the criteria for the initiation of sediment movement and the calculation of the sediment transport rate and the suspended load are presented. At the end of each chapter there are problems with exemplary solutions, for the understanding of the topics that were examined. The material in this book is useful to senior undergraduate and first-year graduate students of studies related to the science of Civil Engineering with a specialization in environmental engineering, as well as to engineers dealing with problems of this kind.

