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Elliptic equations:
an introductory course
by Michel Chipot

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ELLIPTIC EQUATIONS: AN INTRODUCTORY COURSE

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The book "Elliptic Equations: An Introductory Course" is written by Michel Chipot, the well-known Swiss mathematician and outstanding specialist in the field of partial differential equations.

The book introduces the reader to a broad spectrum of topics in the theory of elliptic partial differential equations in a simple and systematic way. It provides a comprehensive introductory course to the theory, each chapter being supplemented with interesting exercises for the reader.

The material of the book is organized into two parts. The first part consists of ten chapters devoted to basic techniques used in the theory of elliptic equations. The topics that are addressed include, in particular, Hilbert space techniques with the fundamental Lax-Milgram theorem, L^P-space techniques, weak formulation method, and the weak maximum principle.

Apart from the fundamental techniques, the first part presents also numerous specialized techniques for studying qualitative properties of the elliptic equations, such as singular perturbation problems, asymptotic analysis for problems in large cylinders, periodic problems, homogenization, eigenvalues and numerical methods.

The second part of the book consists of nine chapters, which contain the more advanced material. The addressed topics include, in particular, some typical nonlinear problems, L^{inf}-estimates, linear elliptic systems, the stationary Navier-Stokes system, regularity theory, the p-Laplace equation, the strong maximum principle, and the problems on the whole space.

The way of presentation of the material in both parts focuses on the ideas and avoids technicalities in order to keep the reader's attention on the beauty and variety of the issues.

The book is a very valuable position in the field of elliptic partial differential equations.

Irena Pawłow

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