Applied Mathematical Sciences

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PREFACE

This book is the result of two courses of lectures given at the University of Cologne in Germany in 1974/75. The majority of the students were not familiar with partial differential equations and functional analysis. This explains why Sections 1, 2, 4 and 12 contain some basic material and results from these areas.

The three parts of the book are largely independent of each other and can be read separately. Their topics are: initial value problems, boundary value problems, solutions of systems of equations. There is much emphasis on theoretical considerations and they are discussed as thoroughly as the algorithms which are presented in full detail and together with the programs. We believe that theoretical and practical applications are equally important for a genuine understanding of numerical mathematics.

When writing this book, we had considerable help and many discussions with H. W. Branca, R. Esser, W. Hackbusch and H. Multhei. H. Lehmann, B. Müller, H. J. Niemeyer, U. Schulte and B. Thomas helped with the completion of the programs and with several numerical calculations.

Springer-Verlag showed a lot of patience and understanding during the course of the production of the book. We would like to use the occasion of this preface to express our thanks to all those who assisted in our sometimes arduous task.

Cologne, Fall 1980

Th. Meis
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