
Preface

This book covers the introduction and analysis of flows in open channels for use as a text or as a reference book. Strong emphasis is given to the application of efficient solution techniques, computational procedures and numerical methods suitable for computer analyses. In addition, the coverage of unsteady flow is as detailed as that of steady flow and extensive up-to-date references are included.

To facilitate learning, short computer programs in FORTRAN related to different chapters, the input data for sample problems, and the computer output are included as Appendices on a CD. These may be used as a guide for the development of software in other advanced languages, such as C, C++, etc. Visual Basic, Mathcad, or Excel are suitable for the majority of these applications.

The original text was based on the lecture notes for a course on open-channel flow for senior-level undergraduate and graduate students and an advanced graduate course on unsteady flow at Old Dominion University and at Washington State University. This is a revised version of the material, parts of which were used at the University of South Carolina in recent years. Suggestions and comments of students, instructors, and several reviewers are incorporated, as appropriate. References are updated throughout the book and additional problems are included. A chapter on sediment transport replaces the chapter on finite-element method and chapters 4 and 15 are supplemented with recent contributions on the topic. Photographs are used extensively to facilitate and enhance the learning of the subject matter.

In recent years, the author has used Chapters 1 through 6, 9 and 10 and parts of chapter 7 in a 3-semester-hour course for senior-level undergraduate and graduate students in water resources and chapters 11 through 15 and part of chapter 17 in an advanced graduate class. Other instructors may prefer to a reduced coverage of chapters 6 and 7 and instead utilize chapters 7 and/or 11 and 16. Parts of different chapters may be used in a course on computational hydraulics or on hydraulic structures.

Thanks are extended to anonymous reviewers for their suggestions for the clarity of presentation. For the preparation of this edition, the assistance of Drs. Ahmed Sattar and Pranab Mohapatra for updating and Ken Young for converting the figures and illustrations for inclusion in Latex files is thankfully acknowledged.

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<http://www.springer.com/978-0-387-76486-3>

Nanometer Technology Designs

High-Quality Delay Tests

Ahmed, N.

2008, XVIII, 281 p. 140 illus., Hardcover

ISBN: 978-0-387-76486-3