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Nota di contenuto	Cover -- Title Page -- Copyright Page -- Contents -- Preface -- Acknowledgments -- About the Companion Website -- Chapter 1 Basic Principles and Flow Classifications -- Fluid Mechanics Foundations -- Hydrologic Foundations -- Presentation Organization -- Problems and Questions -- References -- Chapter 2 Channel Fundamentals* -- Goals -- Channel Elements and Nomenclature -- General Flow Relationships -- Uniform Flow Relationships -- Theoretical Considerations -- Natural, Compound, or Sustainable Channels -- Lined Channels, Optimum Channels, and Velocity Constraints -- Channel Installation -- Summary -- Problems and questions -- References -- Chapter 3 Vegetated Waterways and Bioswales* -- Goals -- Background -- Channel Planning -- Basic Design Procedures -- Bioswales -- Vegetated Filter Strips -- Temporary Linings -- Summary -- Problems and Questions -- References -- Chapter 4 Tractive Force Methods for Earthen Channels -- Goals -- Riprap-lined or earthen waterways (Earthen II) -- Tractive force for vegetated waterways -- Details and Origins of the Parabolic Cross-section -- Costing channel designs -- Steady uniform flow conclusion -- Problems and questions -- References -- Chapter 5 The Energy Equation and Gradually Varied

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Stage-Discharge Relationships of Weir Inlets and Flumes -- Discharge Relations of Orifices and Sluice Gates Inlet Devices -- Flow Hydraulics of Closed Conduits -- Stage-Discharge Curves for Culverts and Spillways -- Closed Conduit Systems for Urban Stormwater Collection -- Ecologic Suitability -- Summary and Conclusions -- Problems and Questions -- References -- Chapter 8 Gradually Varied Unsteady Flow -- Goals -- Hydrologic Routing Approaches -- Kinematic Wave Method -- Diffusion Wave Method -- Dynamic Routing -- Summary and Conclusions -- Problems and Questions -- References -- Chapter 9 Rapidly Varying Unsteady Flow Applications - Waves -- Goals -- Surface Irrigation -- Sluice Gate and Related Operations -- The Dam-Break Problem2 -- Oscillatory Waves -- Summary and Conclusions -- Problems and Questions -- References -- Chapter 10 Channel Design Emphasizing Fine Sediments and Survey of Alluvial Channel Sediment Transport -- Goals -- Alluvial Channel vs. Earthen Channel and Other Preliminaries -- Early Approaches to Sediment Transport -- Incipient Motion -- Riprap or Revetment Specification -- Bedform Descriptions and Analysis -- Sediment Fall Velocity -- A Probabilistic Approach to Sediment Transport -- Einstein (1950)-Laursen (1958)-Graf (1971) Stage-Discharge and Other Hydraulic Calculations -- Van Rijn (1984) Stage-Discharge and Total Load -- Total Load by Regression Approaches -- Sediment Measurement -- Sediment Routing Through Detention Ponds and Streams -- Software Support for Estimating Sediment Transport -- Empirical Channel Design Approaches Leading to Sustainable Channels -- Forces Impacting Channel Cross Sections - Stream Restoration -- Summary and Future Directions -- Problems and Questions -- References -- Appendix A Software and Selected Solutions -- Excel® -- Mathematica® -- HydroCAD -- HY-8 culverts -- HEC-RAS.
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Sommario/riassunto

"With many excellent texts on Open Channel Hydraulics and Sediment Transport, why is another book needed? Available texts represent excellent tools for graduate instruction. We stand on the shoulders of giants in the field such as V.T. Chow, H.A. Einstein, Jr., to mention only a few. Undergraduates generally find the available books to be somewhat intimidating. Available texts tend not to have accessible supporting software. In a knowledge domain where most problems require iterative solutions, a need exists for software to fill a void, especially for undergraduates. The presentation of concepts in Open Channel hydraulics in available texts is more oriented to graduate students who have a solid knowledge of basic concepts. This text supports a split-level class that is mostly undergraduate in composition. Planning for the book began just before the COVID19 pandemic. The move to online courses in response to the COVID-19

pandemic caused many educators to rethink course delivery. In-class and online education, in our experience, is most effective when content is delivered to undergraduates in modules sequentially build on the previously presented material. In our view, an online presentation stresses the need to be as sequential as possible because student interaction becomes more challenging than face-to-face delivery. Another guiding factor in the book organization was to present many design approaches for uniform flow as earlier as possible. Chapter 4 mostly completes the coverage of uniform flow. Early uniform flow presentation enables students to have a toolbox for solving many practical design problems early in the semester. The front-loading of uniform flow allows students to begin working on design projects early in the term. We then present nonuniform flow and unsteady flow topics, enabling their addition to design projects as needed. Graduate students start to work on topics in Chapter 10, which flows from Chapter 4. Graduate students also do extra work on topics related to nonuniform and nonsteady flows as the course continues"--