



Rotating Fluids in Engineering and Science (Dover Civil and Mechanical Engineering)

By James P. Vanyo

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This lucid, well-written presentation of the basic principles and applications of rotating fluid theory is an excellent text for upper-level undergraduate or beginning graduate students, but it will also be invaluable for engineers and scientists whose projects require knowledge of the theory. Readers are assumed to be familiar with vector analysis, fluid mechanics, and partial differential equations.

Part I (Chapters 1-5) introduces the concept of rotating fluids and reviews basic fluid mechanics. Part II (Chapters 6-13) considers concepts, theories, and equations specific to rotating fluids, including vorticity and vortex dynamics and rotating coordinate systems; Coriolis phenomena; rotation, vorticity, and circulation; vorticity as a variable, vortex dynamics, secondary flows; circular pathline flows; and rotation and inertial waves. Each chapter in Part II includes solved quantitative examples. Part III (Chapters 14-22) presents numerous practical applications of the theory, including flows in pipes, channels, and rivers, as well as other applications, in fields ranging from rotors, centrifuges, and turbomachinery to liquids in processing spacecraft, oceanic circulation, and intense atmospheric vortices.

Five useful appendixes provide a synopsis of mathematical relationships, stream functions, and equations of motions, as well as fluid properties and geophysical data. "Highly recommended." — *Choice*.

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