

1. Record Nr.	UNINA9910964850903321
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Titolo	Introduction to fluid mechanics // Y. Nakayama ; UK editor, R.F. Boucher
Pubbl/distr/stampa	London, : Arnold New York, : J. Wiley & Sons, c1999
ISBN	9786611059613 9781281059611 1281059617 9780080523910 0080523919
Edizione	[1st ed.]
Descrizione fisica	1 online resource (321 p.)
Altri autori (Persone)	BoucherR. F (Robert F.)
Disciplina	620.1/06
Soggetti	Fluid mechanics Continuum mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Front Cover; Introduction to Fluid Mechanics; Copyright Page; Contents; ABOUT THE AUTHORS; PREFACE; LIST OF SYMBOLS; CHAPTER 1. HISTORY OF FLUID MECHANICS; 1.1 Fluid mechanics in everyday life; 1.2 The beginning of fluid mechanics; CHAPTER 2. CHARACTERISTICS OF A FLUID; 2.1 Fluid; 2.2 Units and dimensions; 2.3 Density, specific gravity and specific volume; 2.4 Viscosity; 2.5 Surface tension; 2.6 Compressibility; 2.7 Characteristics of a perfect gas; 2.8 Problems; CHAPTER 3. FLUID STATICS; 3.1 Pressure; 3.2 Forces acting on the vessel of liquid; 3.3 Why does a ship float? 3.4 Relatively stationary state3.5 Problems; CHAPTER 4. FUNDAMENTALS OF FLOW; 4.1 Streamline and stream tube; 4.2 Steady flow and unsteady flow; 4.3 Three-dimensional, two-dimensional and one-dimensional flow; 4.4 Laminar flow and turbulent flow; 4.5 Reynolds number; 4.6 Incompressible and compressible fluids; 4.7 Rotation and spinning of a liquid; 4.8 Circulation; 4.9 Problems; CHAPTER 5. ONE-DIMENSIONAL FLOW: mechanism for conservation of flow properties; 5.1 Continuity equation; 5.2 Conservation of energy;

5.3 Conservation of momentum; 5.4 Conservation of angular momentum; 5.5 Problems

CHAPTER 6. FLOW OF VISCOUS FLUID 6.1 Continuity equation; 6.2 Navier-Stokes equation; 6.3 Velocity distribution of laminar flow; 6.4 Velocity distribution of turbulent flow; 6.5 Boundary layer; 6.6 Theory of lubrication; 6.7 Problems; CHAPTER 7. FLOW IN PIPES; 7.1 Flow in the inlet region; 7.2 Loss by pipe friction; 7.3 Frictional loss on pipes other than circular pipes; 7.4 Various losses in pipe lines; 7.5 Pumping to higher levels; 7.6 Problems; CHAPTER 8. FLOW IN A WATER CHANNEL; 8.1 Flow in an open channel with constant section and flow velocity; 8.2 Best section shape of an open channel

8.3 Specific energy 8.4 Constant discharge; 8.5 Constant specific energy; 8.6 Constant water depth; 8.7 Hydraulic jump; 8.8 Problems; CHAPTER 9. DRAG AND LIFT; 9.1 Flows around a body; 9.2 Forces acting on a body; 9.3 The drag of a body; 9.4 The lift of a body; 9.5 Cavitation; 9.6 Problems; CHAPTER 10. DIMENSIONAL ANALYSIS AND LAW OF SIMILARITY; 10.1 Dimensional analysis; 10.2 Buckingham's p theorem; 10.3 Application examples of dimensional analysis; 10.4 Law of similarity; 10.5 Problems; CHAPTER 11. MEASUREMENT OF FLOW VELOCITY AND FLOW RATE; 11.1 Measurement of flow velocity 11.2 Measurement of flow discharge 11.3 Problems; CHAPTER 12. FLOW OF AN IDEAL FLUID; 12.1 Euler's equation of motion; 12.2 Velocity potential; 12.3 Stream function; 12.4 Complex potential; 12.5 Example of potential flow; 12.6 Conformal mapping; 12.7 Problems; CHAPTER 13. FLOW OF A COMPRESSIBLE FLUID; 13.1 Thermodynamical characteristics; 13.2 Sonic velocity; 13.3 Mach number; 13.4 Basic equations for one-dimensional compressible flow; 13.5 Isentropic flow; 13.6 Shock waves; 13.7 Fanno flow and Rayleigh flow; 13.8 Problems; CHAPTER 14. UNSTEADY FLOW; 14.1 Vibration of liquid column in U-tube

14.2 Propagation of pressure in pipe line

Sommario/riassunto

Fluid mechanics is often seen as the most difficult core subject encountered by engineering students. The problem stems from the necessity to visualise complex flow patterns and fluid behaviour modelled by high level mathematics. This text overcomes this difficulty by introducing the concepts through everyday examples, before moving on to the more involved mathematics. The various theories of flow have been correlated with real phenomena and, combined with numerous figures and photographs, help the reader place the subject in context. Examples from a broad range of engineering disciplines are