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Nota di contenuto	Part I Fundamental Aerodynamics -- Introduction -- Inviscid, Incompressible Flow Past Circular Cylinders and Joukowski Airfoils -- Inviscid, Incompressible Flow Past Thin Airfoils -- Inviscid, Compressible Flow Past Thin Airfoils -- Inviscid, Unsteady Flows past Airfoils -- Flow Past Large and Moderate Aspect Ratio Wings -- Axisymmetric Flows and Slender Body Theories -- Viscous Fluid Flow and Laminar Boundary Layers -- Viscous/Inviscid Interaction Procedures -- Part II Special Topics -- Wind Turbine and Propeller Aerodynamics – Analysis and Design -- Glider and Airplane Design -- Introduction to Hypersonic Flows -- Flow Analogies -- Part III Problems and Solutions -- Problems -- Solutions to Problems Appendix: Special

Techniques.

Sommario/riassunto

This book covers classical and modern aerodynamics, theories and related numerical methods, for senior and first-year graduate engineering students, including: -The classical potential (incompressible) flow theories for low speed aerodynamics of thin airfoils and high and low aspect ratio wings. - The linearized theories for compressible subsonic and supersonic aerodynamics. - The nonlinear transonic small disturbance potential flow theory, including supercritical wing sections, the extended transonic area rule with lift effect, transonic lifting line and swept or oblique wings to minimize wave drag. Unsteady flow is also briefly discussed. Numerical simulations based on relaxation mixed-finite difference methods are presented and explained. - Boundary layer theory for all Mach number regimes and viscous/inviscid interaction procedures used in practical aerodynamics calculations. There are also four chapters covering special topics, including wind turbines and propellers, airplane design, flow analogies and hypersonic (rotational) flows. A unique feature of the book is its ten self-tests and their solutions as well as an appendix on special techniques of functions of complex variables, method of characteristics, and conservation laws and shock waves. The book is the culmination of two courses taught every year by the two authors for the last two decades to seniors and first-year graduate students of aerospace engineering at UC Davis.