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| Descrizione fisica      | 1 online resource (xvi, 230 pages) : illustrations   |
| Collana                 | Aerospace engineering collection   |
| Disciplina              | 629.1341   |
| Soggetti                | Airplanes - Design and construction<br>Airplanes - Performance   |
| Lingua di pubblicazione | Inglese  |
| Formato                 | Materiale a stampa   |
| Livello bibliografico   | Monografia   |
| Nota di bibliografia    | Includes bibliographical references and index.   |
| Nota di contenuto       | <p>1. Introduction -- 1.1 Defining a clean-sheet design -- 1.2 Aircraft purpose, the explicit requirements -- 1.3 Certification, the implied requirements --</p> <p>2. Flight mechanics basics -- 2.1 Reference units -- 2.2 Coordinate frames -- 2.3 Standard atmosphere -- 2.4 How pilots actually fly airplanes --</p> <p>3. Propulsion system design drivers and performance -- 3.1 Gas turbine fundamentals -- 3.2 Calculating thrust and fuel flow -- 3.3 Propulsion system components and design drivers -- 3.4 Example engine performance data --</p> <p>4. Aerodynamic analysis fundamentals: lift and drag -- 4.1 Full configuration drag estimation -- 4.2 Zero-lift drag at incompressible speeds -- 4.3 Zero-lift drag due to compressibility -- 4.4 Drag due to lift at incompressible speeds -- 4.5 Drag due to lift arising from compressibility -- 4.6 "Crud drag," the drag of real versus idealized aerostructures -- 4.7 Maximum lift coefficient/buffet boundary -- 4.8 Angle of attack -- 4.9 Take-off, approach, and landing aerodynamics --</p> <p>5. Kinematic "point-performance" principles -- 5.1 Standard atmosphere revisited -- 5.2 Computing stall speed -- 5.3 Minimum and maximum permissible flight speeds -- 5.4 The energy-maneuverability skymap plot -- 5.5 Inferring lift and drag in an E-M</p> |

plot -- 5.6 Aerodynamic efficiency (L/D) and performance efficiency (M (L/D)) -- 5.7 Dimensionalizing drag -- 5.8 Propulsive performance -- 5.9 Specific excess thrust and linear acceleration capability -- 5.10 Specific excess power, rate of climb (R.O.C.), and ceiling -- 5.11 Specific range -- 5.12 Loiter -- 5.13 Induced drag fraction of total drag for level flight limited by aerodynamics and propulsion -- 5.14 Maximum load factor, instantaneous turn rate and stall speed ratio -- 5.15 Combat agility, maximum sustained turn rate -- 6. Mission performance principles -- 6.1 Breguet range equation -- 6.2 Time-step integrating simulations -- 6.3 Creating missions using a mission simulation code -- 6.4 Observations examining the output of a mission simulation code -- 6.5 Creating trade studies using a mission simulation code -- 6.6 Creating payload/range charts using a mission simulation code -- Index.

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## Sommario/riassunto

This book is a concise practical treatise for the student or experienced professional aircraft designer. This volume comprises key fundamental subjects for aerodynamic performance analysis: the basics of flight mechanics bridging both engineering and piloting perspectives, propulsion system performance attributes, practical drag prediction methods, aircraft "up and away" flight performance and aircraft mission performance. This book may serve as a textbook for an undergraduate aircraft performance course or as a reference for the classically trained practicing engineer.

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