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Introduction to Flight Testing and Applied
Aerodynamics - Barnes Warnock McCormick

2011

An introduction into the art and science of

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measuring and predicting airplane performance, "Introduction to Flight Testing and Applied Aerodynamics" will benefit students, homebuilders, pilots, and engineers in learning how to collect and analyze data relevant to the takeoff, climb, cruise, handling qualities, descent, and landing of an aircraft. This textbook presents a basic and concise analysis of airplane performance, stability, and control. Basic algebra, trigonometry, and some calculus are used. Topics discussed include: Engine and propeller performance; Estimation of drag; Airplane dynamics; Wing spanwise lift distributions; Flight experimentation; Airspeed calibration; Takeoff performance; Climb performance; and, Dynamic and static stability. Special features: examples containing student-obtained data about specific airplanes and engines; simple experiments that determine an airplane's performance and handling qualities; and, end-of-chapter problems (with answers supplied in an appendix).

Aircraft Design - Mohammad H. Sadraey
2012-11-20

A comprehensive approach to the air vehicle design process using the principles of systems engineering. Due to the high cost and the risks associated with development, complex aircraft systems have become a prime candidate for the adoption of systems engineering methodologies. This book presents the entire process of aircraft design based on a systems engineering approach from conceptual design phase, through to preliminary design phase and to detail design phase. Presenting in one volume the methodologies behind aircraft design, this book covers the components and the issues affected by design procedures. The basic topics that are essential to the process, such as aerodynamics, flight stability and control, aero-structure, and aircraft performance are reviewed in various chapters where required. Based on these fundamentals and design requirements, the author explains the design

process in a holistic manner to emphasise the integration of the individual components into the overall design. Throughout the book the various design options are considered and weighed against each other, to give readers a practical understanding of the process overall. Readers with knowledge of the fundamental concepts of aerodynamics, propulsion, aero-structure, and flight dynamics will find this book ideal to progress towards the next stage in their understanding of the topic. Furthermore, the broad variety of design techniques covered ensures that readers have the freedom and flexibility to satisfy the design requirements when approaching real-world projects. Key features:

- Provides full coverage of the design aspects of an air vehicle including: aeronautical concepts, design techniques and design flowcharts
- Features end of chapter problems to reinforce the learning process as well as fully solved design examples at component level
- Includes fundamental explanations for

aeronautical engineering students and practicing engineers • Features a solutions manual to sample questions on the book's companion website Companion website - <http://www.wiley.com/go/sadraey> www.wiley.com/go/sadraey/a

Aircraft Design - Daniel P. Raymer 1989

This textbook for advanced students focuses on industry design practice rather than theoretical definitions. Covers configuration layout, payload considerations, aerodynamics, propulsion, structure and loads, weights, stability, and control, performance, and cost analysis.

Annotation copyright Book

[Aircraft Design](#) - Daniel P. Raymer 2018

"Aircraft Design: A Conceptual Approach, Sixth Edition by AIAA Fellow Dr. Daniel P. Raymer provides updates to what has become a standard textbook and reference throughout the world on the subject of aircraft conceptual design. This new edition expands and updates this modern classic including timely topics such as "green

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aircraft" and electric propulsion, but retains the completeness and readability that have placed it in universities and design offices everywhere. The book covers every topic necessary to the understanding of aircraft design, such as aerodynamics, structures, stability and control, propulsion, etc., with an overview introduction starting from first principles. All are discussed from the point of view of the designer, not the specialist in any given topic area"--

Civil Jet Aircraft Design - Lloyd R. Jenkinson
1999

There is an increasing emphasis in aeronautical engineering on design. Concentrating on large scale commercial jet aircraft, this textbook reflects areas of growth in the aircraft industry and the procedures and practices of civil aviation design.

Dynamics - Carlos M. Roithmayr 2016-03-09

This book is ideal for teaching students in engineering or physics the skills necessary to analyze motions of complex mechanical systems

such as spacecraft, robotic manipulators, and articulated scientific instruments. Kane's method, which emerged recently, reduces the labor needed to derive equations of motion and leads to equations that are simpler and more readily solved by computer, in comparison to earlier, classical approaches. Moreover, the method is highly systematic and thus easy to teach. This book is a revision of Dynamics: Theory and Applications (1985), by T. R. Kane and D. A. Levinson, and presents the method for forming equations of motion by constructing generalized active forces and generalized inertia forces. Important additional topics include approaches for dealing with finite rotation, an updated treatment of constraint forces and constraint torques, an extension of Kane's method to deal with a broader class of nonholonomic constraint equations, and other recent advances.

Aircraft Design - Daniel P. Raymer 2006-01-01
Winner of the Summerfield Book Award Winner

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of the Aviation-Space Writers Association Award of Excellence. --Over 30,000 copies sold, consistently the top-selling AIAA textbook title This highly regarded textbook presents the entire process of aircraft conceptual design from requirements definition to initial sizing, configuration layout, analysis, sizing, and trade studies in the same manner seen in industry aircraft design groups. Interesting and easy to read, the book has more than 800 pages of design methods, illustrations, tips, explanations, and equations, and extensive appendices with key data essential to design. It is the required design text at numerous universities around the world, and is a favorite of practicing design engineers.

RDSwin-Student - Daniel P. Raymer
2012-09-30

Living in the Future - Daniel P. Raymer
2010-02-01

Dan Raymer, noted aircraft designer and author

of the industry standard textbook Aircraft Design: A Conceptual Approach, has written a non-technical book that will be treasured by everyone who loves airplanes, wonders how they get designed, and wants to know how somebody becomes an aircraft designer. Half the book is Raymer's warm and personal memoir of growing up in the 50's and 60's as the son of a Navy Test Pilot, discovering his own love of aviation, and entering the rarefied club of those who stare at a blank sheet of paper and turn it into a new aircraft or spacecraft design. The other half covers Raymer's early involvement in the projects that became the B-2, F-22, T-45, F-35, and many more. The book is an "easy" read, quick-paced, funny, and aimed at a general audience. Raymer includes his mistakes, disappointments, and downright stupid decisions. It's not all airplanes either - read about Raymer's aborted musical career, his misadventures in exotic destinations like Belarus, Turkey, and Bulgaria, how he got on the

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Internet early enough to grab www.aircraftdesign.com, and how he came to write his design textbook. The book is in paperback and is due out this fall from Design Dimension Press (Los Angeles, CA).

Introduction to Aircraft Design - John P. Fielding 2017-04-03

The new edition of this popular textbook provides a modern, accessible introduction to the whole process of aircraft design from requirements to conceptual design, manufacture and in-service issues. Highly illustrated descriptions of the full spectrum of aircraft types, their aerodynamics, structures and systems, allow students to appreciate good and poor design and understand how to improve their own designs. Cost data is considerably updated, many new images have been added and new sections are included on the emerging fields of Uninhabited Aerial Vehicles and environmentally-friendly airlines. Examples from real aircraft projects are presented throughout,

demonstrating to students the applications of the theory. Three appendices and a bibliography provide a wealth of information, much not published elsewhere, including simple aerodynamic formulae, an introduction to airworthiness and environmental requirements, aircraft, engine and equipment data, and a case study of the conceptual design of a large airliner.

[Designing Unmanned Aircraft Systems](#) - Jay Gundlach 2014-09-01

Investigates all elements of the UAS design process, including architectural options and design drivers across diverse system classes. This book provides a comprehensive understanding of the end-to-end unmanned aircraft system and a deeper appreciation for the multidisciplinary nature of UAS design.

Aircraft Design - Ajoy Kumar Kundu 2010-04-12
Aircraft Design explores fixed winged aircraft design at the conceptual phase of a project. Designing an aircraft is a complex multifaceted

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process embracing many technical challenges in a multidisciplinary environment. By definition, the topic requires intelligent use of aerodynamic knowledge to configure aircraft geometry suited specifically to the customer's demands. It involves estimating aircraft weight and drag and computing the available thrust from the engine. The methodology shown here includes formal sizing of the aircraft, engine matching, and substantiating performance to comply with the customer's demands and government regulatory standards. Associated topics include safety issues, environmental issues, material choice, structural layout, understanding flight deck, avionics, and systems (for both civilian and military aircraft). Cost estimation and manufacturing considerations are also discussed. The chapters are arranged to optimize understanding of industrial approaches to aircraft design methodology. Example exercises from the author's industrial experience dealing with a typical aircraft design are

included.

Practical Methods for Aircraft and Rotorcraft Flight Control Design - Mark Brian Tischler 2017

Aircraft Design - Daniel P. Raymer 2018

Airplane Design VII - Jan Roskam 1985

Aerothermodynamics of Gas Turbine and Rocket Propulsion - Gordon C. Oates 1997

[Aircraft Performance & Design](#) - John David Anderson 1999

Written by one of the most successful aerospace authors, this new book develops aircraft performance techniques from first principles and applies them to real airplanes. It also addresses a philosophy of, and techniques for aircraft design. By developing and discussing these two subjects in a single text, the author captures a degree of synergism not found in other texts. The book is

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written in a conversational style, a trademark of all of John Anderson's texts, to enhance the readers' understanding.

Introduction to Aircraft Aeroelasticity and Loads
- Jan Robert Wright 2008-02-28

Aeroelastic phenomena arising from the interaction of aerodynamic, elastic and inertia forces, and the loads resulting from flight / ground manoeuvres and gust / turbulence encounters, have a significant influence upon aircraft design. The prediction of aircraft aeroelastic stability, response and loads requires application of a range of interrelated engineering disciplines. This new textbook introduces the foundations of aeroelasticity and loads for the flexible aircraft, providing an understanding of the main concepts involved and relating them to aircraft behaviour and industrial practice. This book includes the use of simplified mathematical models to demonstrate key aeroelastic and loads phenomena including flutter, divergence, control effectiveness and the

response and loads resulting from flight / ground manoeuvres and gust / turbulence encounters. It provides an introduction to some up-to-date methodologies for aeroelastics and loads modelling. It lays emphasis on the strong link between aeroelasticity and loads. It also includes provision of MATLAB and SIMULINK programs for the simplified analyses. It offers an overview of typical industrial practice in meeting certification requirements.

Introduction to Aircraft Flight Mechanics -
Thomas R. Yechout 2003

Based on a 15-year successful approach to teaching aircraft flight mechanics at the US Air Force Academy, this text explains the concepts and derivations of equations for aircraft flight mechanics. It covers aircraft performance, static stability, aircraft dynamics stability and feedback control.

Aircraft Structures - David J. Peery 2013-04-29
This legendary, still-relevant reference text on aircraft stress analysis discusses basic structural

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theory and the application of the elementary principles of mechanics to the analysis of aircraft structures. 1950 edition.

[Advanced Airship Technologies and Design Approaches](#) - Philip V. Hunt 2015-09-01

The Aerodynamic Design of Aircraft -

Dietrich Küchemann 2012-09-01

Dietrich Küchemann's *The Aerodynamic Design of Aircraft* is as relevant and as forward looking today as it was when it was first published in 1978. It comprises the philosophy and life's work of a unique and visionary intellect. Based upon material taught in a course at Imperial College London, the insight and intuition conveyed by this text are timeless. With its republication, Küchemann's influence will extend to the next generation of aerospace industry students and practitioners and the vehicles they will produce. Küchemann establishes three classes of aircraft based on the character of flow involved. Each class is suitable for a distinct cruise speed

regime: classical and swept aircraft for subsonic and transonic cruise, slender-wing aircraft for supersonic cruise, and wave-rider aircraft for hypersonic cruise. Unlike most engineering texts, which focus on a set of tools, Küchemann's approach is to focus on the problem and its solution - what kind of flow is best for a given class of aircraft and how to achieve it. With this approach, Küchemann fully embraces the true inverse nature of design; rather than answer what flow given the shape, he strives to answer what flow given the purpose and then what shape given the flow.

Aircraft Design Projects - Lloyd R. Jenkinson
2003-04-28

Written with students of aerospace or aeronautical engineering firmly in mind, this is a practical and wide-ranging book that draws together the various theoretical elements of aircraft design - structures, aerodynamics, propulsion, control and others - and guides the reader in applying them in practice. Based on a

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range of detailed real-life aircraft design projects, including military training, commercial and concept aircraft, the experienced UK and US based authors present engineering students with an essential toolkit and reference to support their own project work. All aircraft projects are unique and it is impossible to provide a template for the work involved in the design process. However, with the knowledge of the steps in the initial design process and of previous experience from similar projects, students will be freer to concentrate on the innovative and analytical aspects of their course project. The authors bring a unique combination of perspectives and experience to this text. It reflects both British and American academic practices in teaching aircraft design. Lloyd Jenkinson has taught aircraft design at both Loughborough and Southampton universities in the UK and Jim Marchman has taught both aircraft and spacecraft design at Virginia Tech in the US. * Demonstrates how basic aircraft

design processes can be successfully applied in reality * Case studies allow both student and instructor to examine particular design challenges * Covers commercial and successful student design projects, and includes over 200 high quality illustrations

Aircraft Engine Design - Jack D. Mattingly 2002
Annotation A design textbook attempting to bridge the gap between traditional academic textbooks, which emphasize individual concepts and principles; and design handbooks, which provide collections of known solutions. The airbreathing gas turbine engine is the example used to teach principles and methods. The first edition appeared in 1987. The disk contains supplemental material. Annotation c. Book News, Inc., Portland, OR (booknews.com).

Neurophysiology - Roger Carpenter 2012-08-31
The latest edition of this well-established, accessible introduction to neurophysiology succeeds in integrating the disciplines of neurology and neuroscience with an emphasis

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on principles and functional concepts. In *Neurophysiology: A Conceptual Approach*, Fifth Edition, the authors deliver a refreshing alternative to "learning by rote," employing a **Lessons Learned** -

Fundamentals of Aircraft and Airship Design - Leland Malcolm Nicolai 2010

The aircraft is only a transport mechanism for the payload, and all design decisions must consider payload first. Simply stated, the aircraft is a dust cover. "Fundamentals of Aircraft and Airship Design, Volume 1: Aircraft Design" emphasizes that the science and art of the aircraft design process is a compromise and that there is no right answer; however, there is always a best answer based on existing requirements and available technologies.

Elements of Gas Turbine Propulsion - Jack D. Mattingly 2005-01-01

This text provides an introduction to gas turbine engines and jet propulsion for aerospace or

mechanical engineers. The text is divided into four parts: introduction to aircraft propulsion; basic concepts and one-dimensional/gas dynamics; parametric (design point) and performance (off-design) analysis of air breathing propulsion systems; and analysis and design of major gas turbine engine components (fans, compressors, turbines, inlets, nozzles, main burners, and afterburners). Design concepts are introduced early (aircraft performance in introductory chapter) and integrated throughout. Written with extensive student input on the design of the book, the book builds upon definitions and gradually develops the thermodynamics, gas dynamics, and gas turbine engine principles.

Aerodynamics of a Lifting System in Extreme Ground Effect - Kirill V.

Rozhdestvensky 2013-03-09

This book is dedicated to the memory of a distinguished Russian engineer, Rostislav E. Alexeyev, who was the first in the world to

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develop the largest ground effect machine - Ekranoplan. One of Alexeyev's design concepts with the aerodynamic configuration of a flying wing can be seen on the front page. The book presents a description of a mathematical model of flow past a lifting system, performing steady and unsteady motions in close proximity to the underlying solid surface (ground). This case is interesting for practical purposes because both the aerodynamic and the economic efficiency of the system near the ground are most pronounced. Use of the method of matched asymptotic expansions enables closed form solutions for the aerodynamic characteristics of the wings-in-ground effect. These can be used for design, identification, and processing of experimental data in the course of developing ground effect vehicles. The term extreme ground effect, widely used through out the book, is associated with very small relative ground clearances of the order of 10% or less. The theory of a lifting surface, moving in immediate

proximity to the ground, represents one of the few limiting cases that can be treated analytically. The author would like to acknowledge that this work has been influenced by the ideas of Professor Sheila E. Widnall, who was the first to apply the matched asymptotics techniques to treat lifting flows with the ground effect. Saint Petersburg, Russia February 2000 Kirill V. Rozhdestvensky Contents 1.

Introduction.
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Introduction to Aeronautics - Steven A. Brandt 2004

Simplified Aircraft Design for Homebuilders - Daniel P. Raymer 2003

Easy-to-follow, step-by-step methods to lay out, analyse, and optimise your new homebuilt aircraft concept; Industry methods distilled to the essence, and written in a straight forward, easy-to-read style; No derivations, proofs, or complicated equations. Every step is illustrated

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with an all-new design example that is followed through from beginning to end.

Knowledge-Based Integrated Aircraft

Design - Raghu Chaitanya Munjulury

2017-05-23

The design and development of new aircraft are becoming increasingly expensive and timeconsuming. To assist the design process in reducing the development cost, time, and late design changes, the conceptual design needs enhancement using new tools and methods.

Integration of several disciplines in the conceptual design as one entity enables to keep the design process intact at every step and obtain a high understanding of the aircraft concepts at early stages. This thesis presents a Knowledge-Based Engineering (KBE) approach and integration of several disciplines in a holistic approach for use in aircraft conceptual design. KBE allows the reuse of obtained aircrafts' data, information, and knowledge to gain more awareness and a better understanding of the

concept under consideration at early stages of design. For this purpose, Knowledge-Based (KB) methodologies are investigated for enhanced geometrical representation and enable variable fidelity tools and Multidisciplinary Design Optimization (MDO). The geometry parameterization techniques are qualitative approaches that produce quantitative results in terms of both robustness and flexibility of the design parameterization. The information/parameters from all tools/disciplines and the design intent of the generated concepts are saved and shared via a central database. The integrated framework facilitates multi-fidelity analysis, combining low-fidelity models with high-fidelity models for a quick estimation, enabling a rapid analysis and enhancing the time for a MDO process. The geometry is further propagated to other disciplines [Computational Fluid Dynamics (CFD), Finite Element Analysis (FEA)] for analysis. This is possible with an automated streamlined process (for CFD, FEM,

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system simulation) to analyze and increase knowledge early in the design process. Several processes were studied to streamline the geometry for CFD. Two working practices, one for parametric geometry and another for KB geometry are presented for automatic mesh generation. It is observed that analytical methods provide quicker weight estimation of the design and when coupled with KBE provide a better understanding. Integration of 1-D and 3-D models offers the best of both models: faster simulation, and superior geometrical representation. To validate both the framework and concepts generated from the tools, they are implemented in academia in several courses at Linköping University and in industry

RDS-student - Daniel P. Raymer 1992

This CD-ROM incorporates the design and analysis of the RDS-STUDENT book in menu-driven, easy-to-use modules. The program is metric-friendly and all inputs and outputs can be interchanged between metric and fps units by

pressing a button. A full user's manual is also provided.

Performance, Stability, Dynamics, and Control of Airplanes - Bandu N. Pamadi 2004

Complex Systems Design & Management - Omar Hammami 2012-01-12

This book contains all refereed papers that were accepted to the second edition of the « Complex Systems Design & Management » (CSDM 2011) international conference that took place in Paris (France) from December 7 to December 9, 2011. (Website: <http://www.csdm2011.csdm.fr/>). These proceedings cover the most recent trends in the emerging field of complex systems sciences & practices from an industrial and academic perspective, including the main industrial domains (transport, defense & security, electronics, energy & environment, e-services), scientific & technical topics (systems fundamentals, systems architecture& engineering, systems metrics & quality, systemic

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tools) and system types (transportation systems, embedded systems, software & information systems, systems of systems, artificial ecosystems). The CSDM 2011 conference is organized under the guidance of the CESAMES non-profit organization (<http://www.cesames.net/>).

Synthesis of Subsonic Airplane Design - E. Torenbeek 2013-06-29

Since the education of aeronautical engineers at Delft University of Technology started in 1940 under the inspiring leadership of Professor H.J. van der Maas, much emphasis has been placed on the design of aircraft as part of the student's curriculum. Not only is aircraft design an optional subject for thesis work, but every aeronautical student has to carry out a preliminary airplane design in the course of his study. The main purpose of this preliminary design work is to enable the student to synthesize the knowledge obtained separately in courses on aerodynamics, aircraft performances,

stability and control, aircraft structures, etc. The student's exercises in preliminary design have been directed through the years by a number of staff members of the Department of Aerospace Engineering in Delft. The author of this book, Mr. E. Torenbeek, has made a large contribution to this part of the study programme for many years. Not only has he acquired vast experience in teaching airplane design at university level, but he has also been deeply involved in design-oriented research, e.g. developing rational design methods and systematizing design information. I am very pleased that this wealth of experience, methods and data is now presented in this book.

Modeling and Simulation of Aerospace Vehicle Dynamics - Peter H. Zipfel 2000

A textbook for an advanced undergraduate course in which Zipfel (aerospace engineering, U. of Florida) introduces the fundamentals of an approach to, or step in, design that has become a field in and of itself. The first part assumes an

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introductory course in dynamics, and the second some specialized knowledge in subsystem technologies. Practicing engineers in the aerospace industry, he suggests, should be able to cover the material without a tutor. Rather than include a disk, he has made supplementary material available on the Internet. Annotation copyrighted by Book News, Inc., Portland, OR [Freedom of Expression in Botswana](#) - Andrew Briscoe 2002

Advanced Aircraft Design - Egbert Torenbeek
2013-05-28

Although the overall appearance of modern airliners has not changed a lot since the introduction of jetliners in the 1950s, their safety, efficiency and environmental friendliness have improved considerably. Main contributors to this have been gas turbine engine technology, advanced materials, computational aerodynamics, advanced structural analysis and on-board systems. Since aircraft design became

a highly multidisciplinary activity, the development of multidisciplinary optimization (MDO) has become a popular new discipline. Despite this, the application of MDO during the conceptual design phase is not yet widespread. *Advanced Aircraft Design: Conceptual Design, Analysis and Optimization of Subsonic Civil Airplanes* presents a quasi-analytical optimization approach based on a concise set of sizing equations. Objectives are aerodynamic efficiency, mission fuel, empty weight and maximum takeoff weight. Independent design variables studied include design cruise altitude, wing area and span and thrust or power loading. Principal features of integrated concepts such as the blended wing and body and highly non-planar wings are also covered. The quasi-analytical approach enables designers to compare the results of high-fidelity MDO optimization with lower-fidelity methods which need far less computational effort. Another advantage to this approach is that it can provide

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answers to “what if” questions rapidly and with little computational cost. Key features: Presents a new fundamental vision on conceptual airplane design optimization Provides an overview of advanced technologies for propulsion and reducing aerodynamic drag Offers insight into the derivation of design sensitivity information Emphasizes design based on first principles Considers pros and cons of innovative configurations Reconsiders optimum cruise performance at transonic Mach numbers Advanced Aircraft Design: Conceptual Design, Analysis and Optimization of Subsonic Civil Airplanes advances understanding of the initial optimization of civil airplanes and is a must-have reference for aerospace engineering students, applied researchers, aircraft design engineers and analysts.

Conceptual Aircraft Design - Ajoy Kumar Kundu
2019-01-02

Provides a Comprehensive Introduction to Aircraft Design with an Industrial Approach This

book introduces readers to aircraft design, placing great emphasis on industrial practice. It includes worked out design examples for several different classes of aircraft, including Learjet 45, Tucano Turboprop Trainer, BAe Hawk and Airbus A320. It considers performance substantiation and compliance to certification requirements and market specifications of take-off/landing field lengths, initial climb/high speed cruise, turning capability and payload/range. Military requirements are discussed, covering some aspects of combat, as is operating cost estimation methodology, safety considerations, environmental issues, flight deck layout, avionics and more general aircraft systems. The book also includes a chapter on electric aircraft design along with a full range of industry standard aircraft sizing analyses. Split into two parts, Conceptual Aircraft Design: An Industrial Approach spends the first part dealing with the pre-requisite information for configuring aircraft so that readers can make informed decisions

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when designing vessels. The second part devotes itself to new aircraft concept definition. It also offers additional analyses and design information (e.g., on cost, manufacture, systems, role of CFD, etc.) integral to conceptual design study. The book finishes with an introduction to electric aircraft and futuristic design concepts currently under study. Presents an informative, industrial approach to aircraft design Features design examples for aircraft such as the Learjet 45, Tucano Turboprop Trainer, BAe Hawk,

Airbus A320 Includes a full range of industry standard aircraft sizing analyses Looks at several performance substantiation and compliance to certification requirements Discusses the military requirements covering some combat aspects Accompanied by a website hosting supporting material Conceptual Aircraft Design: An Industrial Approach is an excellent resource for those designing and building modern aircraft for commercial, military, and private use.