

1. Record Nr.	UNINA9910810516603321
Autore	Keane A. J.
Titolo	Small unmanned fixed-wing aircraft design : a practical approach // A. J. Keane, Andras Sobester, James P. Scanlan
Pubbl/distr/stampa	Hoboken, NJ : , : John Wiley & Sons, Incorporated, , 2017
ISBN	1-5231-2377-X 1-119-40632-3 1-119-40631-5 1-119-40630-7
Edizione	[First edition.]
Descrizione fisica	1 online resource (492 pages) : color illustrations
Collana	Aerospace series
Disciplina	629.133/39
Soggetti	Drone aircraft - Design and construction Airplanes - Design and construction
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover ; Title Page ; Copyright ; Contents ; List of Figures ; List of Tables ; Foreward ; Series Preface ; Preface ; Acknowledgments ; Part I Introducing Fixed-Wing UAVs ; Chapter 1 Preliminaries ; 1.1 Externally Sourced Components ; 1.2 Manufacturing Methods. 1.3 Project DECODE 1.4 The Stages of Design ; 1.4.1 Concept Design ; 1.4.2 Preliminary Design ; 1.4.3 Detail Design ; 1.4.4 Manufacturing Design ; 1.4.5 In-service Design and Decommissioning ; 1.5 Summary ; Chapter 2 Unmanned Air Vehicles ; 2.1 A Brief Taxonomy of UAVs. 2.2 The Morphology of a UAV 2.2.1 Lifting Surfaces ; 2.2.2 Control Surfaces ; 2.2.3 Fuselage and Internal Structure ; 2.2.4 Propulsion Systems ; 2.2.5 Fuel Tanks ; 2.2.6 Control Systems ; 2.2.7 Payloads ; 2.2.8 Take-off and Landing Gear ; 2.3 Main Design Drivers. Part II The Aircraft in More Detail Chapter 3 Wings ; 3.1 Simple Wing Theory and Aerodynamic Shape ; 3.2 Spars ; 3.3 Covers ; 3.4 Ribs ; 3.5 Fuselage Attachments ; 3.6 Ailerons/Roll Control ; 3.7 Flaps ; 3.8 Wing Tips ; 3.9 Wing-housed Retractable Undercarriage. 3.10 Integral Fuel Tanks Chapter 4 Fuselages and Tails (Empennage) ; 4.1 Main Fuselage/Nacelle Structure ; 4.2 Wing Attachment ; 4.3 Engine and Motor Mountings ; 4.4 Avionics Trays ; 4.5 Payloads Camera Mountings ; 4.6 Integral Fuel Tanks

Small Unmanned Fixed-wing Aircraft Design is the essential guide to designing, building and testing fixed wing UAVs (or drones). It deals with aircraft from two to 150 kg in weight and is based on the first-hand experiences of the world renowned UAV team at the UK's University of Southampton. The book covers both the practical aspects of designing, manufacturing and flight testing and outlines the essential calculations needed to underpin successful designs. It describes the entire process of UAV design from requirements definition to configuration layout and sizing, through preliminary design and analysis using simple panel codes and spreadsheets to full CFD and FEA models and on to detailed design with parametric CAD tools. Its focus is on modest cost approaches that draw heavily on the latest digital design and manufacturing methods, including a strong emphasis on utilizing off-the-shelf components, low cost analysis, automated geometry modelling and 3D printing. It deliberately avoids a deep theoretical coverage of aerodynamics or structural mechanics; rather it provides a design team with sufficient insights and guidance to get the essentials undertaken more pragmatically. The book contains many all-colour illustrations of the dozens of aircraft built by the authors and their students over the last ten years giving much detailed information on what works best. It is predominantly aimed at undergraduate and MSc level student design and build projects, but will be of interest to anyone engaged in the practical problems of getting quite complex unmanned aircraft flying. It should also appeal to the more sophisticated aero-modeller and those engaged on research based around fixed wing UAVs.
