



Rotorcraft Aeromechanics (Cambridge Aerospace Series, 36)

By Wayne Johnson

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A rotorcraft is a class of aircraft that uses large-diameter rotating wings to accomplish efficient vertical take-off and landing. The class encompasses helicopters of numerous configurations (single main rotor and tail rotor, tandem rotors, coaxial rotors), tilting proprotor aircraft, compound helicopters, and many other innovative configuration concepts. Aeromechanics covers much of what the rotorcraft engineer needs: performance, loads, vibration, stability, flight dynamics, and noise. These topics include many of the key performance attributes and the often-encountered problems in rotorcraft designs. This comprehensive book presents, in depth, what engineers need to know about modelling rotorcraft aeromechanics. The focus is on analysis, and calculated results are presented to illustrate analysis characteristics and rotor behaviour. The first third of the book is an introduction to rotorcraft aerodynamics, blade motion, and performance. The remainder of the book covers advanced topics in rotary wing aerodynamics and dynamics.

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Editorial Review

Review

"This comprehensive book is a "must read" for rotorcraft students and researchers and practicing engineers. This fascinating classic provides a fresh look at many complex rotary-wing phenomena."

Inderjit Chopra, Journal of the American Helicopter Society

"... a masterpiece ... Rotorcraft Aeromechanics is a classic contribution to rotorcraft literature ... this is an essential read for practicing engineers, an invaluable guide for researchers and an ideal reference for graduate students and faculty. For those wishing to join the rotorcraft field and those who - like this reviewer - grew up studying Helicopter Theory, this will be a delightful new study and an essential companion."

Anubhav Datta, Vertiflite

"Rotorcraft Aeromechanics is an extremely comprehensive book and a welcome update to the author's first book Helicopter Theory. The new book covers effectively the intervening developments in technologies and analytical methods used to assess rotorcraft and rotor systems."

Richard Markiewicz, The Aeronautical Journal

About the Author

Wayne Johnson worked at the U.S. Army Aeromechanics Laboratory from 1970 to 1981 at the NASA Ames Research Center. He was with NASA from 1981 to 1986, including a couple of years as Assistant Branch Chief. Dr Johnson founded Johnson Aeronautics in 1986, under which he developed rotorcraft software until 1998. Since 1998, he has worked at the Aeromechanics Branch of NASA Ames Research Center. Dr Johnson is author of the comprehensive analysis CAMRADII and the rotorcraft design code NDARC; and of the book Helicopter Theory (1990). He is a Fellow of the American Institute of Aeronautics and Astronautics (AIAA) and the American Helicopter Society (AHS) and has received a U.S. Army Commander's Award for Civilian Service, NASA Medals for Exceptional Engineering Achievement and Exceptional Technology Achievement, the AHS Grover E. Bell Award, the Ames H. Julian Allen Award, the AIAA Pendray Aerospace Literature Award and the 2010 AHS Alexander Nikolsky Honorary Lectureship.

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