

Invention and Evolution:Design in Nature and Engineering

M. J. French



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This textbook for engineering students provides an introduction to design for function, using many examples of manufactured artifacts and living organisms to demonstrate fundamental underlying principles. Nature has taken millions of years to evolve numerous solutions for many design problems. The author demonstrates that the same underlying design principles for man-made objects also apply to living organisms, and shows how common themes can be found in mechanisms such as knees and car suspensions, structures such as feathers and ships, and systems such as horses and hydrofoils. The examples forcefully illustrate the importance of the basic design principles as related to materials, energy and information. The author also discusses the relation of aesthetic and functional design, the crucial relation of design to production in artifacts, and reproduction in organisms. The book concludes with a brief summary of the role and requirements of designers and inventors.

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