

## Best Books Science Engineering

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### Making and Tinkering with STEM Vintage

From Newton's Law of Gravity to the Black-Scholes model used by bankers to predict the markets, equations, are everywhere -- and they are fundamental to everyday life. Seventeen Equations that Changed the World examines seventeen ground-breaking equations that have altered the course of human history. He explores how Pythagoras's Theorem led to GPS and Satnav; how logarithms are applied in architecture; why imaginary numbers were important in the development of the digital camera, and what is really going on with Schrödinger's cat. Entertaining, surprising and vastly informative, *Seventeen Equations that Changed the World* is a highly original exploration -- and explanation -- of life on earth.

Civil Engineering and the Science of Structures Universities Press

It ' s hands-on science with a capital " E " —for engineering. Beginning with the toppling of the Colossus of Rhodes, one of the seven wonders of the ancient world, to the destructive, laserlike sunbeams bouncing off London ' s infamous " Fryscraper " in 2013, here is an illustrated tour of the greatest engineering disasters in history, from the bestselling author of *The Book of Totally Irresponsible Science*. Each engineering disaster includes a simple, exciting experiment or two using everyday household items to explain the underlying science and put learning into action. Understand the Titanic ' s demise by sinking an ice-cube-tray ocean liner in the bathtub. Stomp on a tube of toothpaste to demonstrate what happens to non-Newtonian fluids under pressure—and how a ruptured tank sent a tsunami of molasses through the streets of Boston in 1919. From why the Leaning Tower of Pisa leans to the fatal design flaw in the Sherman tank, here ' s a book of science at its most riveting.

The Book of Massively Epic Engineering Disasters Sourcebooks, Inc.

Science/Engineering "Petroski has an inquisitive mind, and he is a fine writer. . . . [He] takes us on a lively tour of engineers, their creations and their necessary turns of mind." --Los Angeles Times From the Ferris wheel to the integrated circuit, feats of engineering have changed our environment in countless ways, big and small. In *Remaking the World: Adventures in Engineering*, Duke University's Henry Petroski focuses on the big: Malaysia's 1,482-foot Petronas Towers as well as the Panama Canal, a cut through the continental

divide that required the excavation of 311 million cubic yards of earth. *Remaking the World* tells the stories behind the man-made wonders of the world, from squabbles over the naming of the Hoover Dam to the effects the Titanic disaster had on the engineering community of 1912. Here, too, are the stories of the personalities behind the wonders, from the jaunty Isambard Kingdom Brunel, designer of nineteenth-century transatlantic steamships, to Charles Steinmetz, oddball genius of the General Electric Company, whose office of preference was a battered twelve-foot canoe. Spirited and absorbing, *Remaking the World* is a celebration of the creative instinct and of the men and women whose inspirations have immeasurably improved our world. "Petroski [is] America's poet laureate of technology. . . . *Remaking the World* is another fine book." --Houston Chronicle "Remaking the World really is an adventure in engineering." --San Diego Union-Tribune

*The Way Things Work Now* CRC Press

A groundbreaking treatise by one of the great mathematicians of our age, who outlines a style of thinking by which great ideas are conceived. What inspires and spurs on a great idea? Can we train ourselves to think in a way that will enable world-changing understandings and insights to emerge? Richard Hamming said we can. He first inspired a generation of engineers, scientists, and researchers in 1986 with "You and Your Research," an electrifying sermon on why some scientists do great work, why most don't, why he did, and why you can—and should—too. *The Art of Doing Science and Engineering* is the full expression of what "You and Your Research" outlined. It's a book about thinking; more specifically, a style of thinking by which great ideas are conceived. The book is filled with stories of great people performing mighty deeds—but they are not meant simply to be admired. Instead, they are to be aspired to, learned from, and surpassed. Hamming consistently returns to Shannon's information theory, Einstein's theory of relativity, Grace Hopper's work on high-level programming, Kaiser's work on digital filters, and his own work on error-correcting codes. He also recounts a number of his spectacular failures as clear examples of what to avoid. Originally published in 1996 and adapted from a course that Hamming taught at the US Naval Postgraduate School, this edition includes an all-new foreword by designer, engineer, and founder of Dynamicland Bret Victor, plus more than 70 redrawn graphs and charts. *The Art of Doing Science and*

Engineering is a reminder that a capacity for learning and creativity are accessible to everyone. Hamming was as much a teacher as a scientist, and having spent a lifetime forming and confirming a theory of great people and great ideas, he prepares the next generation for even greater distinction.

#### Power, Speed, and Form Stripe Press

Data-driven discovery is revolutionizing how we model, predict, and control complex systems. Now with Python and MATLAB®, this textbook trains mathematical scientists and engineers for the next generation of scientific discovery by offering a broad overview of the growing intersection of data-driven methods, machine learning, applied optimization, and classical fields of engineering mathematics and mathematical physics. With a focus on integrating dynamical systems modeling and control with modern methods in applied machine learning, this text includes methods that were chosen for their relevance, simplicity, and generality. Topics range from introductory to research-level material, making it accessible to advanced undergraduate and beginning graduate students from the engineering and physical sciences. The second edition features new chapters on reinforcement learning and physics-informed machine learning, significant new sections throughout, and chapter exercises. Online supplementary material – including lecture videos per section, homeworks, data, and code in MATLAB®, Python, Julia, and R – available on [databookuw.com](http://databookuw.com).

#### Engineering a Better Future Pearson Education

This open access book examines how the social sciences can be integrated into the praxis of engineering and science, presenting unique perspectives on the interplay between engineering and social science. Motivated by the report by the Commission on Humanities and Social Sciences of the American Association of Arts and Sciences, which emphasizes the importance of social sciences and Humanities in technical fields, the essays and papers collected in this book were presented at the NSF-funded workshop ‘ Engineering a Better Future: Interplay between Engineering, Social Sciences and Innovation ’, which brought together a singular collection of people, topics and disciplines. The book is split into three parts: A. Meeting at the Middle: Challenges to educating at the boundaries covers experiments in combining engineering education and the social sciences; B. Engineers Shaping Human Affairs: Investigating the interaction between social sciences and engineering, including the cult of innovation, politics of engineering, engineering design and future of societies; and C. Engineering the Engineers: Investigates thinking about design with papers on the art and science of science and engineering practice.

#### Seventeen Equations that Changed the World Prentice Hall

The Greeks and Romans were considerable engineers. They made many remarkable machines, which were not bettered until the Industrial Revolution. Landels shows how these machines were developed and made. He draws together evidence from archaeological discoveries and from literary sources.

#### The Art of Insight in Science and Engineering Springer Nature

From acoustics to holograms—explore awesome engineering facts for kids ages 8 to 12 Did you know that computer chips can be thousands of times smaller than a grain of sand? Or that whale fins inspired the wind turbine? The Fascinating Engineering Book for Kids is packed with 500 incredible facts about every branch of engineering with full-color pictures to match! Kids (and adults) will learn about some of the most famous and influential engineers in history, and explore how engineers helped build so many of the amazing things in our world, from underwater machines to spaceships and satellites! Dig into the best in kids’ engineering books with fascinating trivia like: The Ancient

Theatre of Epidaurus is an amphitheater in Greece built in the fourth century. It was designed so well that it is still used today! GloFish are genetically engineered to enhance their luminescence—a glow that can be seen under ultraviolet lights. Robotic engineers can work in animatronics where they design and build robots for entertainment, like the ones you see in theme parks. Inspire curiosity and a lifelong love of science with this mind-boggling book of engineering for kids.

#### The Simple Science of Flight, revised and expanded edition Engineering in Action

“ Another gem from one of the world’s justly celebrated historians specializing in unusual and always fascinating subjects and people. ” — Booklist (starred review) The revered New York Times bestselling author traces the development of technology from the Industrial Age to the Digital Age to explore the single component crucial to advancement—precision—in a superb history that is both an homage and a warning for our future. The rise of manufacturing could not have happened without an attention to precision. At the dawn of the Industrial Revolution in eighteenth-century England, standards of measurement were established, giving way to the development of machine tools—machines that make machines. Eventually, the application of precision tools and methods resulted in the creation and mass production of items from guns and glass to mirrors, lenses, and cameras—and eventually gave way to further breakthroughs, including gene splicing, microchips, and the Hadron Collider. Simon Winchester takes us back to origins of the Industrial Age, to England where he introduces the scientific minds that helped usher in modern production: John Wilkinson, Henry Maudslay, Joseph Bramah, Jesse Ramsden, and Joseph Whitworth. It was Thomas Jefferson who later exported their discoveries to the fledgling United States, setting the nation on its course to become a manufacturing titan. Winchester moves forward through time, to today’s cutting-edge developments occurring around the world, from America to Western Europe to Asia. As he introduces the minds and methods that have changed the modern world, Winchester explores fundamental questions. Why is precision important? What are the different tools we use to measure it? Who has invented and perfected it? Has the pursuit of the ultra-precise in so many facets of human life blinded us to other things of equal value, such as an appreciation for the age-old traditions of craftsmanship, art, and high culture? Are we missing something that reflects the world as it is, rather than the world as we think we would wish it to be? And can the precise and the natural co-exist in society?

#### The Quantum Moment Rockridge Press

If solving chemical engineering problems quickly and accurately is key to your work, here's an invaluable info-packed resource: McGraw-Hill's Handbook of Chemical Engineering Calculations. Fully revised and expanded, this Third Edition delivers step-by-step procedures for performing a wide array of chemical engineering calculations -- along with fully worked-out examples that help you avoid costly errors. Book jacket.

#### Handbook of Chemical Engineering Calculations National Academies Press

The question of where Russian history ends and Ukrainian history begins has not yet received a satisfactory answer. Generations of historians referred to Kyiv, the capital of Ukraine, as the starting point of the Muscovite dynasty, the Russian state, and, ultimately, the Russian nation. However, the history of Kyiv and that of the Scythians of the Northern Black Sea region have also been claimed by Ukrainian historians, and are now regarded as integral parts of the history of Ukraine. If these are actually the beginnings of Ukrainian history, when does Russian history start? In Ukraine and Russia, Serhii Plokhly discusses many questions fundamental to the formation of modern Russian and Ukrainian historical identity. He investigates the critical role of history in the development of modern national identities and offers historical and cultural insight into the current state of relations between the two nations. Plokhly shows how history has been constructed, used, and misused in order to

justify the existence of imperial and modern national projects, and how those projects have influenced the interpretation of history in Russia and Ukraine. This book makes important assertions not only about the conflicts and negotiations inherent to opposing historiographic traditions, but about ways of overcoming the limitations imposed by those traditions.

Masteringengineering with Pearson Etext -- Access Card -- Introduction to Materials Science National Geographic Books

I am very much aware that it is an act of extreme rashness to attempt to write an elementary book about structures. Indeed it is only when the subject is stripped of its mathematics that one begins to realize how difficult it is to pin down and describe those structural concepts which are often called 'elementary'; by which I suppose we mean 'basic' or 'fundamental'. Some of the omissions and oversimplifications are intentional but no doubt some of them are due to my own brute ignorance and lack of understanding of the subject. Although this volume is more or less a sequel to *The New Science of Strong Materials* it can be read as an entirely separate book in its own right. For this reason a certain amount of repetition has been unavoidable in the earlier chapters. I have to thank a great many people for factual information, suggestions and for stimulating and sometimes heated discussions. Among the living, my colleagues at Reading University have been generous with help, notably Professor W. D. Biggs (Professor of Building Technology), Dr Richard Chaplin, Dr Giorgio Jeronimidis, Dr Julian Vincent and Dr Henry Blyth; Professor Anthony Flew, Professor of Philosophy, made useful suggestions about the last chapter. I am also grateful to Mr John Bartlett, Consultant Neurosurgeon at the Brook Hospital. Professor T. P. Hughes of the University of the West Indies has been helpful about rockets and many other things besides. My secretary, Mrs Jean Collins, was a great help in times of trouble. Mrs Nethercot of Vogue was kind to me about dressmaking. Mr Gerald Leach and also many of the editorial staff of Penguins have exercised their accustomed patience and helpfulness. Among the dead, I owe a great deal to Dr Mark Pryor - lately of Trinity College, Cambridge - especially for discussions about biomechanics which extended over a period of nearly thirty years. Lastly, for reasons which must surely be obvious, I owe a humble oblation to Herodotus, once a citizen of Halicarnassus.

Computer Simulations in Science and Engineering Dorling Kindersley Ltd

Even bad code can function. But if code isn't clean, it can bring a development organization to its knees. Every year, countless hours and significant resources are lost because of poorly written code. But it doesn't have to be that way. Noted software expert Robert C. Martin presents a revolutionary paradigm with *Clean Code: A Handbook of Agile Software Craftsmanship*. Martin has teamed up with his colleagues from Object Mentor to distill their best agile practice of cleaning code "on the fly" into a book that will instill within you the values of a software craftsman and make you a better programmer – but only if you work at it. What kind of work will you be doing? You'll be reading code – lots of code. And you will be challenged to think about what's right about that code, and what's wrong with it. More importantly, you will be challenged to reassess your professional values and your commitment to your craft. *Clean Code* is divided into three parts. The first describes the principles, patterns, and practices of writing clean code. The second part consists of several case studies of increasing complexity. Each case study is an exercise in cleaning up code – of transforming a code base that has some problems into one that is sound and efficient. The third part is the payoff: a single chapter containing a list of heuristics and "smells" gathered while creating the case studies. The result is a knowledge base that describes the way we think when we write, read, and clean code. Readers will come away from this book understanding How to tell the difference between good and bad code How to write good code and how to transform bad code into good code How to create

good names, good functions, good objects, and good classes How to format code for maximum readability How to implement complete error handling without obscuring code logic How to unit test and practice test-driven development This book is a must for any developer, software engineer, project manager, team lead, or systems analyst with an interest in producing better code.

Data-Driven Science and Engineering Cambridge University Press

Fifty-two inspiring and insightful profiles of history's brightest female scientists. "Rachel Swaby's no-nonsense and needed Headstrong dynamically profiles historically overlooked female visionaries in science, technology, engineering, and math." —Elle In 2013, the *New York Times* published an obituary for Yvonne Brill. It began: "She made a mean beef stroganoff, followed her husband from job to job, and took eight years off from work to raise three children." It wasn't until the second paragraph that readers discovered why the *Times* had devoted several hundred words to her life: Brill was a brilliant rocket scientist who invented a propulsion system to keep communications satellites in orbit, and had recently been awarded the National Medal of Technology and Innovation. Among the questions the obituary—and consequent outcry—prompted were, Who are the role models for today's female scientists, and where can we find the stories that cast them in their true light?

Headstrong delivers a powerful, global, and engaging response. Covering Nobel Prize winners and major innovators, as well as lesser-known but hugely significant scientists who influence our every day, Rachel Swaby's vibrant profiles span centuries of courageous thinkers and illustrate how each one's ideas developed, from their first moment of scientific engagement through the research and discovery for which they're best known. This fascinating tour reveals 52 women at their best—while encouraging and inspiring a new generation of girls to put on their lab coats.

Clean Code MIT Press

A guide to making scientific photographs for presentations, journal submissions, and covers, featuring step-by-step instructions and case studies, by an award-winning science photographer; illustrated in color throughout. One of the most powerful ways for scientists to document and communicate their work is through photography. Unfortunately, most scientists have little or no training in that craft. In this book, celebrated science photographer Felice Frankel offers a guide for creating science images that are both accurate and visually stunning. *Picturing Science and Engineering* provides detailed instructions for making science photographs using the DSLR camera, the flatbed scanner, and the phone camera. The book includes a series of step-by-step case studies, describing how final images were designed for cover submissions and other kinds of visualizations. Lavishly illustrated in color throughout, the book encourages the reader to learn by doing, following Frankel as she recreates the stages of discovery that lead to a good science visual. Frankel shows readers how to present their work with graphics--how to tell a visual story--and considers issues of image adjustment and enhancement. She describes how developing the right visual to express a concept not only helps make science accessible to nonspecialists, but also informs the science itself, helping scientists clarify their thinking. Within the book are specific URLs where readers can view Frankel's online tutorials--visual "punctuations" of this printed edition. Additional materials, including tutorials and videos, can be found online at the book's website. Published with the help of funding from Furthermore: a program of the J. M. Kaplan fund

The Fascinating Engineering Book for Kids Crown

Tools to make hard problems easier to solve. In this book, Sanjoy Mahajan shows us that the way to master complexity is through insight rather than precision. Precision can overwhelm us with information, whereas insight connects seemingly disparate pieces of information into a simple picture. Unlike computers, humans depend on insight. Based on the author's fifteen years of teaching at MIT, Cambridge University, and Olin College, *The Art of Insight in Science and Engineering* shows us how to build insight and find understanding, giving readers tools to help them solve any problem in science and engineering. To master complexity, we can organize it or discard it. *The Art of Insight in Science and Engineering* first teaches the tools for organizing complexity, then distinguishes the two paths for discarding complexity: with and without loss of information. Questions and problems throughout the text help

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readers master and apply these groups of tools. Armed with this three-part toolchest, and without complicated mathematics, readers can estimate the flight range of birds and planes and the strength of chemical bonds, understand the physics of pianos and xylophones, and explain why skies are blue and sunsets are red. The Art of Insight in Science and Engineering will appear in print and online under a Creative Commons Noncommercial Share Alike license.

Science and Engineering of Small Arms Mit Press

Little scientists will understand science in seconds with this essential homework-helping guide. Learn about everything from molecules and magnetism to rockets and radio waves and find out how a hot-air balloon rises, how erosion flattens mountains, how light waves zip through space, and how the human eye sees colours! With STEM (science, technology, engineering, and maths) subjects ever more important in today's technological world, How to be Good at Science, Technology, and Engineering is the perfect book to inspire and educate inquisitive young minds and prepare them for the future. This is the perfect homework guide for parents and their children, with all core curriculum areas of science included. Cool illustrations show the appliance of science in the real world: see how microchips, tractors, and suspension bridges work. Hands-on projects feature fun experiments to try at home or school: try polishing old coins in vinegar, or make an erupting volcano with baking soda.

Invention By Design MIT Press

Power, Speed, and Form is the first accessible account of the engineering behind eight breakthrough innovations that transformed American life from 1876 to 1939—the telephone, electric power, oil refining, the automobile, the airplane, radio, the long-span steel bridge, and building with reinforced concrete. Beginning with Thomas Edison's system to generate and distribute electric power, the authors explain the Bell telephone, the oil refining processes of William Burton and Eugene Houdry, Henry Ford's Model T car and the response by General Motors, the Wright brothers' airplane, radio innovations from Marconi to Armstrong, Othmar Ammann's George Washington Bridge, the reinforced concrete structures of John Eastwood and Anton Tedesko, and in the 1930s, the Chrysler Airflow car and the Douglas DC-3 airplane. These innovations used simple numerical ideas, which the Billingtons integrate with short narrative accounts of each breakthrough—a unique and effective way to introduce engineering and how engineers think. The book shows how the best engineering exemplifies efficiency, economy and, where possible, elegance. With Power, Speed, and Form, educators, first-year engineering students, liberal arts students, and general readers now have, for the first time in one volume, an accessible and readable history of engineering achievements that were vital to America's development and that are still the foundations of modern life.

Cosmos Ballantine Books

"A very fun way to learn about where quantum physics comes from and the strange, even astonishing places it has gone." —Peter Galison, Harvard University, author of Einstein's Clocks, Poincaré's Maps From multiverses and quantum leaps to Schrödinger's cat and time travel, quantum mechanics has irreversibly shaped the popular imagination. Entertainers and writers from Lady Gaga to David Foster Wallace take advantage of its associations and nuances. In The Quantum Moment, philosopher Robert P. Crease and physicist Alfred Scharff Goldhaber recount the fascinating story of how the quantum jumped from physics into popular culture, with brief explorations of the underlying math and physics concepts and descriptions of the fiery disputes among figures including Einstein, Schrödinger, and Niels Bohr. Understanding and appreciating quantum imagery, its uses and abuses, is part of what it means to be an educated person in the twenty-first century. The Quantum Moment serves as an indispensable guide.

Structures or Why things don't fall down Univ of California Press

This book is about the role of some engineering principles in our everyday lives. Engineers study these principles and use them in the design and analysis of the products and systems with which they work. The same principles play basic and influential roles in our everyday lives as well. Whether the

concept of entropy, the moments of inertia, the natural frequency, the Coriolis acceleration, or the electromotive force, the roles and effects of these phenomena are the same in a system designed by an engineer or created by nature. This shows that learning about these engineering concepts helps us to understand why certain things happen or behave the way they do, and that these concepts are not strange phenomena invented by individuals only for their own use, rather, they are part of our everyday physical and natural world, but are used to our benefit by the engineers and scientists. Learning about these principles might also help attract more and more qualified and interested high school and college students to the engineering fields. Each chapter of this book explains one of these principles through examples, discussions, and at times, simple equations.