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# Mathematics And Technology (Springer Undergraduate Texts In Mathematics And Technology)

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SPRINGER UNDERGRADUATE
MATHEMATICS AND TECHNOLOGY

Christiane Rousseau
Yvan Saint-Aubin

**Mathematics and Technology**

Chris Hamilton, Translator

Springer
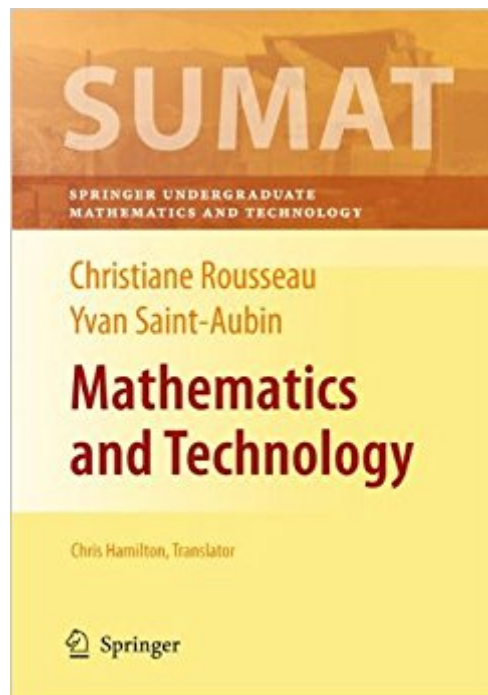
## Synopsis

This book introduces the student to numerous modern applications of mathematics in technology. The authors write with clarity and present the mathematics in a clear and straightforward way making it an interesting and easy book to read. Numerous exercises at the end of every section provide practice and reinforce the material in the chapter. An engaging quality of this book is that the authors also present the mathematical material in a historical context and not just the practical one. Mathematics and Technology is intended for undergraduate students in mathematics, instructors and high school teachers. Additionally, its lack of calculus centricity as well as a clear indication of the more difficult topics and relatively advanced references make it suitable for any curious individual with a decent command of high school math.

## Book Information

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## Customer Reviews

From the reviews:"Christiane Rousseau and Yvan Saint-Aubin here present a valuable collection of diverse and detailed applied mathematics examples. â | presented to work as a standalone guide to mathematics at work today, usable for self-study and enlightenment or as a text for coursework. â | Chapters conclude with a rich collection of exercises followed by references for further study. â | together with the clear signposts to help students get around and through the more difficult topics, make Mathematics and Technology suitable for any diligent reader â | ." (Tom Schulte, MAA Online, February, 2009)"This book takes a more detailed view of mathematics in action, in several areas of technology â | . This is an excellent book for a varied audience. â | This book will also be attractive to

college students â | and to researchers in mathematics, computer science (CS), and technology, who want to acquire a more thorough understanding of the applications covered in the book. â | the authors give several pointers and suggestions to instructors. â | I like this book and I recommend it." (Edgar R. Chavez, ACM Computing Reviews, June, 2009)â œThe authors highlight how mathematical modeling, together with the power of mathematical tools, has been crucial for innovation in technology. â | The text is written for students who have a familiarity with Euclidean geometry and have mastered multivariable calculus, linear algebra, and elementary probability theory. â | undergraduates in their junior or senior years are the ideal audience for the course.â •
(Tzvetan Semerdjiev, Zentralblatt MATH, Vol. 1211, 2011)

MathematicsÂ and TechnologyÂ presents technological applications of mathematics making use of elegant mathematical concepts. The selected subjects consist of: public key cryptography, error correcting codes, the global positioning system (GPS) and cartography, image compression using fractals and the JPEG format, digital recording, robot movement, DNA computing, Google's PageRank algorithm, savings and loans, gamma ray surgery and random number generators.Â The authors highlight how mathematical modeling, together with the power of mathematical tools, have been crucial for innovation in technology. The exposition is clear, straightforward, motivated by excellent examples, and user-friendly. Numerous exercises at the end of every chapter reinforce the material. An engaging quality is the various historical notes accompanying the mathematical development.  This bookÂ is intended mainly forÂ undergraduate students in pure and applied mathematics, physics and computer science, instructors, and high school teachers.Â The mainÂ prerequisites areÂ linear algebra and Euclidean geometry. A few chapters require multivariable calculus and elementary probability theory. A clear indication of the more difficult topics and relatively advanced references make it also suitable for an independent reader mastering the prerequisites.

This is a book that collects lots of technological products and/or methods that relates to mathematics.Suitable for lectures or seminars to undergraduate and graduate students. One can understand the influence of mathematics in modern technologies and even our daily life. Very highly recommended.

Text book for college.

A interesting book covering a wide range of applications. The titles of the first four, of eleven, chapters gives a sense of the broad diversity of topics: (1) Positioning on Earth and in Space, (2) Friezes and Mosaics, (3) Robotic motion, (4) Skeletons and Gamma-Ray Radiosurgery. The material is generally well-written and is always interesting and instructive. This translation contains the occasional awkward sentence and, at least for U.S. readers, the occasional variant spellings, e.g., surprizing instead of surprising. At times, these can interrupt the smooth 'flow' of the text. Translation issues aside, this is a book that is both understandable and worth understanding.Debatably, the most interesting application area presented is "Friezes and Mosaics", with its connection to linear algebra, symmetries, and transformations. Not surprisingly, applications discussed here are generally not unique to this work, and also appear in other application collections, e.g, the first chapter of "The Lighter Side of Mathematics" edited by Richard Guy also contains a discussion of frieze patterns.There is some issue with marketing's description of the necessary mathematical prerequisites. Its overly optimistic to say, this book is "suitable for any curious individual with a decent command of high school math". This is an under-specification of the full prerequisite requirements.For example, in the second chapter on Friezes and Mosaics readers are asked to remember, from their prior course work, "the classification of extrema of two variables using the second partial derivative test" and "the Hessian matrix". To gain full value from all chapters, readers will need in addition to linear algebra and Euclidean geometry, basic probability theory, as well as single variable and multivariable calculus. That is, they'll need more mathematical experience and maturity than might be implied from the specified prerequisite of a " decent command of high school math".In conclusion: Acknowledging the occasional, albeit minor, awkwardness of the translation, for those with the appropriate mathematical prerequisites, this text can be recommended for its informative presentation of a variety of diverse and interesting mathematical applications.

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