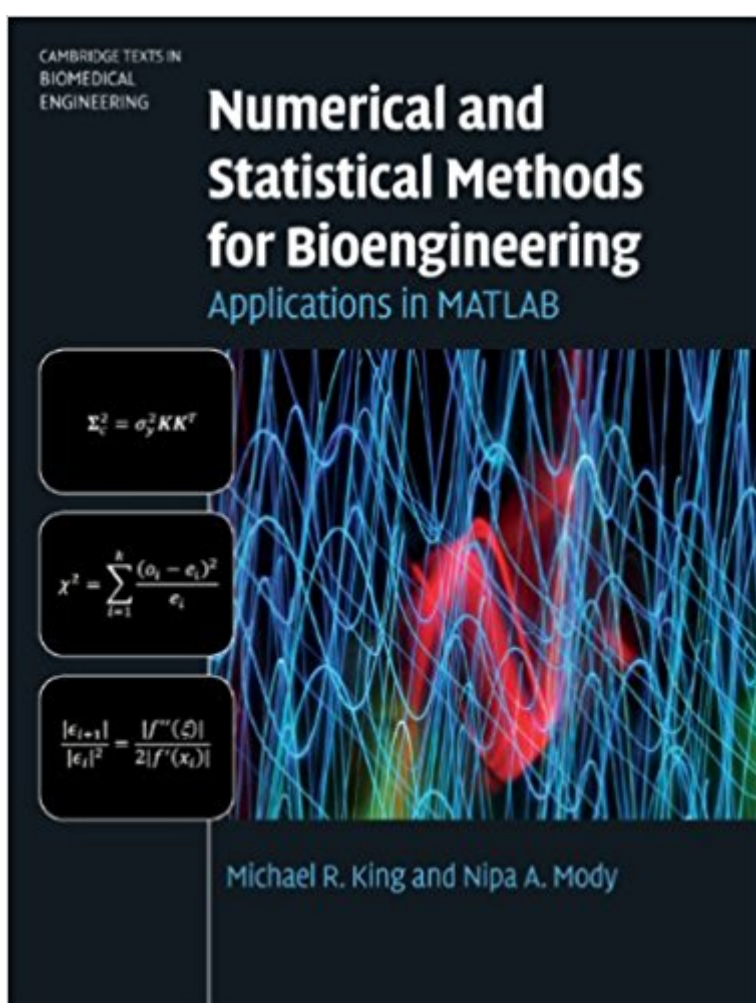The book was found

Numerical And Statistical Methods For Bioengineering: Applications In MATLAB (Cambridge Texts In Biomedical Engineering)

CAMBRIDGE TEXTS IN BIOMEDICAL ENGINEERING

Numerical and Statistical Methods for Bioengineering

Applications in MATLAB

$$\Sigma_c^2 = \sigma_y^2 KK^T$$

$$\chi^2 = \sum_{i=1}^{k} \frac{(o_i - e_i)^2}{e_i}$$

$$\frac{|\epsilon_{i+1}|}{|\epsilon_i|^2} = \frac{|f'''(\xi)|}{2|f'(x_i)|}$$

Michael R. King and Nipa A. Mody

Synopsis

The first MATLAB-based numerical methods textbook for bioengineers that uniquely integrates modelling concepts with statistical analysis, while maintaining a focus on enabling the user to report the error or uncertainty in their result. Between traditional numerical method topics of linear modelling concepts, nonlinear root finding, and numerical integration, chapters on hypothesis testing, data regression and probability are interweaved. A unique feature of the book is the inclusion of examples from clinical trials and bioinformatics, which are not found in other numerical methods textbooks for engineers. With a wealth of biomedical engineering examples, case studies on topical biomedical research, and the inclusion of end of chapter problems, this is a perfect core text for a one-semester undergraduate course.

Book Information

Series: Cambridge Texts in Biomedical Engineering

Hardcover: 594 pages

Publisher: Cambridge University Press; 1 edition (November 29, 2010)

Language: English

ISBN-10: 0521871581

ISBN-13: 978-0521871587

Product Dimensions: 7.4 x 1.2 x 9.7 inches

Shipping Weight: 3.1 pounds

Average Customer Review: 3.0 out of 5 stars   6 customer reviews

Best Sellers Rank: #464,348 in Books (See Top 100 in Books)   #161 in Books > Engineering & Transportation > Engineering > Bioengineering > Biomedical Engineering   #301 in Books > Textbooks > Medicine & Health Sciences > Medicine > Clinical > Family & General Practice   #417 in Books > Medical Books > Medicine > Internal Medicine > Family Practice

Customer Reviews

"The book is really easy to read and places frameworks for numerical analysis into realistic bioengineering concepts that students will find familiar and relevant. This is most evident in the excellent boxed examples, but also in many of the homework problems. I also really liked the "key points to consider" at the end of the chapters - these are useful reminders for the students. Finally, the book presents bioinformatics in a manageable fashion that should help demystify this subject for interested students." - K. Jane Grande-Allen, Rice University

The first MATLAB-based numerical methods textbook specifically for bioengineers, including topics on hypothesis testing, plus numerous examples drawn exclusively from biomedical engineering applications. This is an ideal core text for one-semester undergraduate courses, and is also a valuable reference for anyone interested in the quantitative aspects of biology research.

This book does not help at all in my understanding of numerical and statistical analysis. It is long, boring, and way too complicated.

With Numerical and Statistical Methods for Bioengineering, King and Mody have provided a textbook that satisfies the needs of many people within the fields of biomedical sciences/bio(medical)-engineering. For those new to biomedical research, this book will certainly serve you as an invaluable resource throughout your career. The textbook touches on the most important concepts/methods used for data analysis. Examples of important concepts discussed in the text include finding the errors associated with model parameters and finding the covariance matrix for model parameters, among many others. For those of you more experienced in the field, this book will certainly serve you as a reference text when the need arises to review methods for finding roots for nonlinear equations, for performing numerical quadrature for ordinary differential equations, for performing numerical model regression and optimization, or when the need arises to utilize useful algorithms for bioinformatic analysis (i.e. BLAST, ClustalW, T-Coffee, etc.).The textbook explains all methods from first principles. The book flows in a logical progression and this makes it very easy on the reader. Dozens of real-life scenarios are used to provide examples of how to apply the methods in everyday life (i.e. transport phenomena, pharmocokinetics, research studies, etc.).This textbook also provides written out MATLAB code for all methods discussed. Having used this book for my own projects and research, I fully recommend this book.

This book is very didactic. It has clear explanations and interesting problems. Other reviewers have said it before.What sets this book apart, though, is that the authors give a purpose to the concepts they teach. Here, math is a tool to analyze scientific data and publish your work. The book is full of examples from the biomedical literature, from a broad variety of research areas. Even the problems, at the end of each chapter, refer to published work (as far as I can tell.) And even though textbook authors who do reference the literature often tend to have a bias for their own research interests and end up citing themselves almost exclusively, it is not the case in this book! The authors use examples that range from microbial population dynamics, enzyme kinetics, and genetics to MRI

data analysis... There are too many to list. If you're interested in the biomedical field at all, you will find an example or a problem in this book that speaks to you.It's the basis of pedagogy: if you want your students to remember the material, you need to make sure they understand why they're studying it. And this book achieves this goal by showing us the real-life applications the concepts taught have. I think every professor who teaches math for bioengineers or biomedical students should assign this textbook to their class. But I also believe this is a good reference book. Now that I own it and worked with it last semester in one of my courses, I actually find myself referring back to it this semester when working on assigned problems.

The examples in the book are extremely straight forward, and the MATLAB codes included in the book are step by step, and explained throughout. I hadn't used MATLAB for about 2 years prior to this, and the book is so well organized by the chapters, that it is easy to pick it up. I mean it is pretty hard not to understand a lot in the book as most of it is explained in basic, simple, and easy terminology. I think this is the best book in this area to learn from.

Poorly organized with questions at the end of each chapter which are not clearly written.

This book has been written very well. The language is simple and easy to understand. The examples are very helpful and the questions behind the book are also good. I am totally satisfied with this book!!

Numerical and Statistical Methods for Bioengineering: Applications in MATLAB (Cambridge Texts in Biomedical Engineering) Biomedical Engineering Principles Of The Bionic Man (Series on Bioengineering & Biomedical Engineering) (Bioengineering & Biomedical Engineering (Paperback)) Numerical and Statistical Methods for Bioengineering (Cambridge Texts in Biomedical Engineering) An Introduction to Modeling of Transport Processes: Applications to Biomedical Systems (Cambridge Texts in Biomedical Engineering) Biomedical Engineering: Bridging Medicine and Technology (Cambridge Texts in Biomedical Engineering) Biomedical Engineering for Global Health (Cambridge Texts in Biomedical Engineering) Biomedical Ethics for Engineers: Ethics and Decision Making in Biomedical and Biosystem Engineering (Biomedical Engineering Series) Introduction to Medical Imaging: Physics, Engineering and Clinical Applications (Cambridge Texts in Biomedical Engineering) Introduction to Biomaterials: Basic Theory with Engineering Applications (Cambridge Texts in Biomedical Engineering) Numerical Methods with Chemical Engineering Applications

(Cambridge Series in Chemical Engineering) Applied Numerical Methods with MATLAB for Engineers and Scientists (Civil Engineering) Neuroprosthetics: Theory and Practice (Series on Bioengineering & Biomedical Engineering - Vol. 2) Numerical Methods in Biomedical Engineering Dynamics of the Vascular System (Series on Bioengineering & Biomedical Engineering - Vol. 1) Image Processing with MATLAB: Applications in Medicine and Biology (MATLAB Examples) Biomedical Engineering Fundamentals (The Biomedical Engineering Handbook, Fourth Edition) (Volume 1) An Introduction to Programming and Numerical Methods in MATLAB Applied Numerical Methods with MATLAB for Engineers and Scientists Applied Numerical Methods W/MATLAB: for Engineers & Scientists Introductory Biomechanics: From Cells to Organisms (Cambridge Texts in Biomedical Engineering)