

Signals and Systems for Bioengineers, Second Edition: A MATLAB-Based Introduction (Biomedical Engineering)

By John Semmlow

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Signals and Systems for Bioengineers, Second Edition, is the only textbook that relates important electrical engineering concepts to biomedical engineering and biological studies. It explains in detail the basic engineering concepts that underlie biomedical systems, medical devices, biocontrol, and biosignal analysis. It is perfect for the one-semester bioengineering course usually offered in conjunction with a laboratory on signals and measurements which presents the fundamentals of systems and signal analysis. The target course occupies a pivotal position in the bioengineering curriculum and will play a critical role in the future development of bioengineering students.

This book provides increased coverage of time-domain signal analysis as well as biomeasurement, using examples in ultrasound and electrophysiology. It also presents new applications in biocontrol, with examples from physiological systems modeling such as the respiratory system. It contains double the number of Matlab and non-Matlab exercises to provide ample practice solving problems - by hand and with computational tools. More biomedical figures are found throughout the book. For instructors using this text in their course, an accompanying website (www.elsevierdirect.com, in Semmlow page) includes support materials such as MATLAB data and functions needed to solve the problems, a few helpful routines, and all of the MATLAB examples.

Intended readers include biomedical engineering students, practicing medical technicians, mechanical engineers, and electrical engineers.

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Editorial Review

From the Back Cover
Circuits, Signals, and Systems for Bioengineers: A MATLAB Based Introduction, provides a clear, straightforward introduction to the basic engineering concepts related to signal processing and linear systems analysis. Major topics include the Fourier Transform, complex sinusoidal (phasor) analysis, the Transfer Function, the Laplace Transform, time and frequency domain representations, and convolution. The text is written to be very accessible, particularly to younger students, with deeper concepts, such as the Fourier series analysis and the Transfer Function, presented in a highly intuitive manner. The overriding objective of this text is to give students a solid foundation in the concepts of linear systems analysis and signal processing. Examples and problems are chosen to be instructive and include examples of relevant biomedical applications.

KEY FEATURES:
·Translates important electrical engineering tools such as, analog modeling, systems modeling, and other linear systems analysis techniques for bioengineering students.
·Includes MATLAB examples and problems.

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About the Author
John Semmlow was a professor in the Department of Biomedical Engineering of Rutgers University and in the Department of Surgery of Robert Wood Johnson Medical School UMDNJ for 32 years. Over that period he published over 100 review journal articles and has been appointed a Fellow of the IEEE, the AIMBE, and the BMES. He retired in June of 2010, but still remains active in research, particularly cardiovascular diagnosis and human motor control. He is actively pursuing a ‘second career’ as an artist, designing and building computer controlled kinetic art: sculptures that move in interesting and intriguing ways.

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