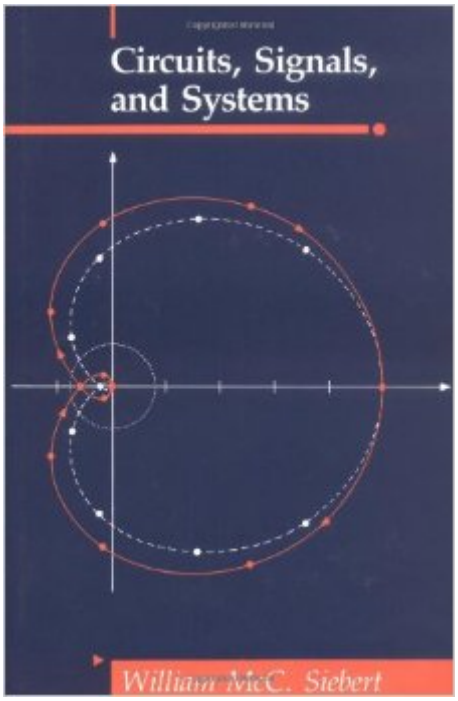
Circuits, Signals, And Systems



Synopsis

These twenty lectures have been developed and refined by Professor Siebert during the more than two decades he has been teaching introductory Signals and Systems courses at MIT. The lectures are designed to pursue a variety of goals in parallel: to familiarize students with the properties of a fundamental set of analytical tools; to show how these tools can be applied to help understand many important concepts and devices in modern communication and control engineering practice; to explore some of the mathematical issues behind the powers and limitations of these tools; and to begin the development of the vocabulary and grammar, common images and metaphors, of a general language of signal and system theory. Although broadly organized as a series of lectures, many more topics and examples (as well as a large set of unusual problems and laboratory exercises) are included in the book than would be presented orally. Extensive use is made throughout of knowledge acquired in early courses in elementary electrical and electronic circuits and differential equations. Contents: Review of the "classical" formulation and solution of dynamic equations for simple electrical circuits; The unilateral Laplace transform and its applications; System functions; Poles and zeros; Interconnected systems and feedback; The dynamics of feedback systems; Discrete-time signals and linear difference equations; The unilateral Z-transform and its applications; The unit-sample response and discrete-time convolution; Convolutional representations of continuous-time systems; Impulses and the superposition integral; Frequency-domain methods for general LTI systems; Fourier series; Fourier transforms and Fourier’s theorem; Sampling in time and frequency; Filters, real and ideal; Duration, rise-time and bandwidth relationships: The uncertainty principle; Bandpass operations and analog communication systems; Fourier transforms in discrete-time systems; Random Signals; Modern communication systems. Circuits, Signals, and Systems is included in The MIT Press Series in Electrical Engineering and Computer Science, copublished with McGraw-Hill.

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Customer Reviews

I can understand why some people don’t like the book. It is brief and odd. However, it is one my favorite books in recent years. It covers lots of things in essence in 600+ pages in a cohesive, well structured manner.In many detailed textbooks, the authors would adopt a non-rigorous way of arriving at concepts, which was easy to read, but not the method they themselves would use in a paper. When we go to grad school, many of us are surprised by the different derivation methods used for the same idea.In this book, it never tried to say "hey, read me and you will understand everything." It says "read me, and you have nothing to lose and may even gain something." Reading this book probably brings you closer to how a good engineer/scientist thinks rather than what an author wants you to think, as in other books.The thoughts are well developed. It is a joy to read if you start from page 1 slowly. This is the kind of book you want to have on a deserted island, not something to read the night before an exam or while stuck by a problem. Not enough detials for exams or lab, but enough to open your eyes. In my personal opinion, unless you are outrageously smart, this is the kind of books that can rescue you from being just another average engineer.

This is a thorough introductory text on the subject of signals and systems. It assumes the reader is skilled in basic analog circuit analysis (RLC, op-amps, etc) and progresses through FFTs. It is probably best used in a classroom setting where the confused reader can refer to other sources for clarification. (This reviewer had Siebert as the lecturer and found lecture and recitation sections invaluable.) The motivated self-study student, however, can learn much. This book’s examples couple well with other texts such as Oppenheim and Willsky. This text’s (Siebert) clarity also increases proportionally with the reader’s math skill level (diff eq’s preferred).

Siebert is the ONLY circuits text in print, that I have found,that stesses signals/systems concepts and is directed to realBS degree candidates. The problems are informative, challenging,and puts EE students on the path to becoming real, thinking,contributing engineers. Quite contrary to ALL of the

otherundergraduate texts that come out in an even lower, moreinsultingly watered-down version every two years, Siebert getsBETTER every year, if only by comparison. I love the way ituses the prerequisite differential equations course; without which electric circuits cannot and do not exist. Students shouldfind it a fun book to read; full of insight and EE applications.

Disclaimer: Bill Siebert was my advisor, but Kennedy taught from this book to our class. There is a real and useful difference between examples and principles, and this book does an absolutely outstanding job of moving form general principle to practical problem and back. It remains one of my absolutely favorite textbooks and I return to it again and again. I am now twenty years out from my undergraduate course, in a totally different field (I wear a stethoscope nowadays) and I apply the material in this book every day. As another reviewer mentioned, this book pairs nicely with Oppenheim's books, esp Oppenheim and Schafer 1975. $44? thats cheaper now than I paid then. If you have an interest in linear systems and the transfer function formalism of linear time-invariant systems, this is a great book.