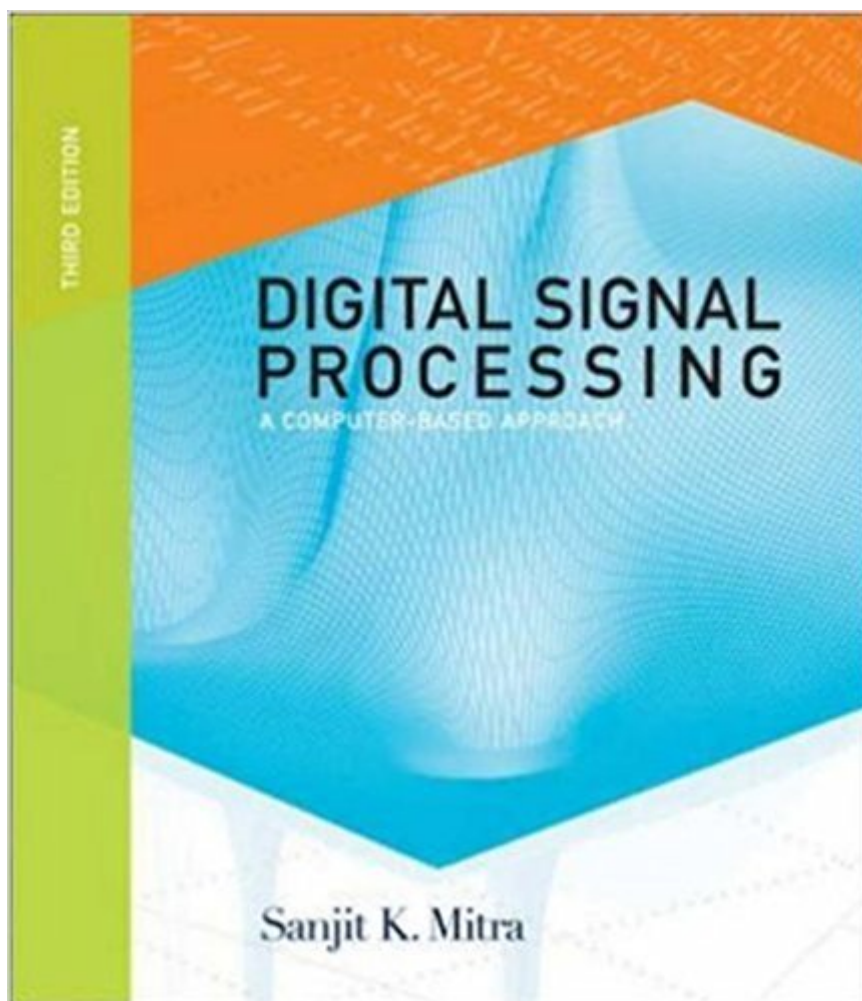


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# Digital Signal Processing



## Synopsis

Digital Signal Processing: A Computer-Based Approach is intended for a two-semester course on digital signal processing for seniors or first-year graduate students. Based on user feedback, a number of new topics have been added to the third edition, while some excess topics from the second edition have been removed. The author has taken great care to organize the chapters more logically by reordering the sections within chapters. More worked-out examples have also been included. The book contains more than 500 problems and 150 MATLAB exercises. New topics in the third edition include: short-time characterization of discrete-time signals, expanded coverage of discrete-time Fourier transform and discrete Fourier transform, prime factor algorithm for DFT computation, sliding DFT, zoom FFT, chirp Fourier transform, expanded coverage of z-transform, group delay equalization of IIR digital filters, design of computationally efficient FIR digital filters, semi-symbolic analysis of digital filter structures, spline interpolation, spectral factorization, discrete wavelet transform.

## Book Information

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## Customer Reviews

Sanjit Mitra, Ph.D., University of California, Berkeley. Professor Mitra transferred to UCSB in July 1977 after 10 years at UC Davis. He obtained his B.Sc. with honors in Physics (1953) and the M.Sc. (Tech.) in Radio Physics and Electronics (1956) in India. He then obtained his M.S. (1960) and Ph.D. (1962) in electrical engineering from UC Berkeley. He has published over 600 papers in the areas of analog and digital signal processing, and image processing. He has also authored and

co-authored twelve books, and holds five patents. Dr. Mitra has served IEEE in various capacities including service as the President of the IEEE Circuits & Systems Society in 1986, and has held visiting appointments in Australia, Austria, Finland, India, Japan, Singapore and the United Kingdom.

This is easily the worst textbook I have ever used. It is filled with typos. This makes it useless for both teaching and reference. You have no idea if what you are looking at is actually a correct result. The instructions on many of the problems are also vague, incomplete or confusing. For example, one problem instructs the reader to take the  $N$  point DFTs of 5 length  $N$  sequences from another part of the textbook for 4 values of  $N$  and then compare them to the DTFTs for those same sequences, sampled at particular points. This would be all well and good, although extremely tedious to do for the 20 combinations, except for the fact that none of the sequences he references are length  $N$ . The reader is left wondering what the actual instruction should be. This is sadly quite typical. I'm not sure Mitra had any editing process in place whatsoever.

Digital signal processing is a difficult subject, especially for beginners, and this book does nothing to alleviate the situation for the new learner. After reading multiple DSP books, it's painfully obvious that the explanations in this book are confusing and opaque. Often equations and mathematical proofs are buried within text paragraphs making it extremely difficult for the reader to follow along. The MATLAB experiments are not the panacea one is led to believe. I personally struggled in a DSP class for 6 weeks until I decided to go against the class requirements and I started over by reading the Oppenheim book. The Oppenheim book is a thorough treatment of the subject and is simply better. The Oppenheim book, still difficult, but better explained and very thorough. Discrete-Time Signal Processing (3rd Edition) (Prentice Hall Signal Processing) The Schaum's outline was useful as a reference and explained some of the fundamental concepts well, but I would NOT use it as the sole reference. Schaum's Outline of Digital Signal Processing, 2nd Edition (Schaum's Outline Series) This book may be a better starter for the beginner due to its simpler explanations. Serious practitioners would probably move to Oppenheim eventually. Understanding Digital Signal Processing (3rd Edition) This book provides almost all experimental learning with little math explanation. It's been useful for getting a "feeling" of how things work and was a lot of fun. Practical Signal Processing Furthermore, Mitra ensures that the problems at the end of the chapters are different for the International version of his book. I don't know how common this is, but I have never encountered this before in undergrad or graduate courses. I don't know what goals the author had in

doing this besides possibly selling more books. I would like to give the person the benefit of doubt, but, like I said, I have not encountered this before. This book helped me the most while working on my car. I used it as a tirestop when I jacked up the car. It forever resides in my trunk for this purpose.

I got about 5 different DSP texts. This one was I'd put in the bottom 2. The Matlab stuff is OK but if you already know Matlab, not really that helpful. "Understanding Digital Signal Processing" is my favorite DSP reference. Love the plots relating S-plane, real freqs, and z-transform.

Worst thing about this book -- example problems for complex topics range from adequate to non-existent. There are many topics covered, some utterly without examples either in problems or in the text. Next worst thing -- big glaring errors in at least this edition: wrong examples, answers to problems, miscellaneous errata, etc. Next worst thing -- the pagination is terrible, looks like a rush job: Relevant figures and examples (when they exist) to sections appear sometimes 3 or 4 pages away, such that to follow, you have to keep flipping back and forth to relate figs and ex's. to the text.

In the age of computer based word processors, I am surprised that there are 8 pages of errata supplied by the publisher. Concepts are briefed over with few or no examples on how to solve problems. As with most upper level engineering course books, I feel this book is written to impress peers and colleagues, not to impart knowledge to students that are novice to the topic.

This book is extremely helpful and very well written. It was required in my DSP class. There is a CD attached with it which included some Matlab codes that simulated concepts in the book and are very helpful for my final project for the class. I find the examples in the book very helpful for my labs as well.

As for the content, the book avoided some definition jungles that some other book tangled with, so it's easy for a beginner to grasp. However you'll want the Oppenheim book when you wonder "where did he get that conclusion/theorem/equation?" Also the solutions to the problems is a pandemonium of errors and typos, especially in the latter chapters. So be confident when you're doubtful of the corrections your professor made on your homework! Bought it from BooksRus as used book. No marks, no tears, no water stains. Literally "like new".

Used this book for an intro to DSP course. Fairly high level for someone who is not interested in DSP applications or new to the field. Helpful in understanding applications of DSP.

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