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# Analog and Digital Signals and Systems

By R. K. Rao Yarlagadda



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This book presents a systematic, comprehensive treatment of analog and discrete signal analysis and synthesis and an introduction to analog communication theory. This evolved from my 40 years of teaching at Oklahoma State University (OSU). It is based on three courses, Signal Analysis (a second semester junior level course), Active Filters (a first semester senior level course), and Digital signal processing (a second semester senior level course). I have taught these courses a number of times using this material along with existing texts. The references for the books and journals (over 160 references) are listed in the bibliography section. At the undergraduate level, most signal analysis courses do not require probability theory. Only, a very small portion of this topic is included here. I emphasized the basics in the book with simple mathematics and the sophistication is minimal. Theorem-proof type of material is not emphasized. The book uses the following model: 1. Learn basics 2. Check the work using bench marks 3. Use software to see if the results are accurate The book provides detailed examples (over 400) with applications. A three-number system is used consisting of chapter number – section number – example or problem number, thus allowing the student to quickly identify the related material in the appropriate section of the book. The book includes well over 400 homework problems. Problem numbers are identified using the above three-number system.



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## **Editorial Review**

### **Review**

From the reviews:

“This textbook presents the classical mathematical methods in signal processing. The theory is explained by numerous examples and figures. This book written for students in electrical engineering consists of 10 chapters and 3 appendices ... Each chapter closes with a short summary and numerous exercises.”  
(Manfred Tasche, Zentralblatt MATH, Vol. 1200, 2011)

From the Back Cover

This is a comprehensive and cohesive presentation of analog and digital signal processing and filtering for electrical engineers. The author covers the principle concepts of analog and digital signals, generalized Fourier series approximations with sinusoidal and non-sinusoidal functions, and analog convolutions and correlations. Signals and linear system interactions, system stability and bandwidths are also discussed. Analysis and design of analog low-pass, high-pass, band-pass, band elimination filters, and delay line filters are discussed using operational amplifiers. Problems associated with nonlinear systems are included.

Key features include:

- Discrete-time Fourier transforms
- SINC functions to illustrate the generalized Fourier series concepts
- One consistent notation scheme used throughout the book

The author addresses the main concepts of digital signals, convolution, correlation and deconvolution. Digital filter designs using finite and infinite based impulse responses are presented along with their filter structures. Also included is coverage of basic analog communications including AM, FM and multiplexing as well as simple digital modulations. Example problems are presented in detail throughout the book and over 400 end of chapter problems are provided for further study.

## **Users Review**

**From reader reviews:**

**Edward Payne:**

The particular book Analog and Digital Signals and Systems has a lot of knowledge on it. So when you check out this book you can get a lot of profit. The book was written by the very famous author. Mcdougal makes some research prior to write this book. This specific book very easy to read you can get the point easily after scanning this book.

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