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# Communication Systems: Fundamentals and Design Methods

By Nevio Benvenuto, Roberto Corvaja, Tomaso Erseghe, Nicola Laurenti



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**Communication Systems: Fundamentals and Design Methods** By Nevio Benvenuto, Roberto Corvaja, Tomaso Erseghe, Nicola Laurenti

In undergraduate classes on communications it is crucial for the students to acquire a deep and thorough understanding of the system principles, methods of analysis, and design tradeoffs. *Communication Systems: Fundamentals and Design Methods* provides a rigorous mathematical treatment of modulations, covering well-established analog techniques, such as AM and FM, and the more advanced digital formats, such as QAM and CDMA. Using a probabilistic approach, the analytical evaluation of system performance gives rise to the key concept of 'link budget', showing the role of transmit power, channel bandwidth and receiver noise level. Different systems are then compared on the basis of the above parameters.

## Key features:

- Comprehensively covers the basics of communication systems, without overemphasizing new technologies which require a much deeper background
- Presents a clearly outlined course track, derived from years of teaching experience
- Enriched by discussions and examples of implementation, and by a wide variety of almost 300 problems, with solutions provided in the companion website
- Includes coverage of deterministic and random signals, as well as transmission media and devices, passband signals, linear, amplitude, angular, digital and binary modulation

The book is a perfect textbook for undergraduate students on electrical engineering, computer science and telecommunications courses, as well as graduate students, engineers and operators involved in the design and deployment of communication networks.



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## **Editorial Review**

From the Back Cover

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About the Author

**Nevio Benvenuto** is Full Professor in the Department of Electrical Engineering, University of Padova, Italy. His research interests include voice and data communications, digital radio, and signal processing. As well as publishing in journals including Electronics Letters, IEEE Transactions on Wireless Communications, and IEEE Transactions on Signal Processing, he is also an Editor for Modulation/Detection, published by the IEEE Communications Society.

**Roberto Corvaja, Tomaso Erseghe and Nicola Laurenti** are all Assistant Professors at the Department of Information Engineering, University of Padova, Italy.

## **Users Review**

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