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# Principles of Mobile Communication

*By Gordon L. Stüber*

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## Principles of Mobile Communication By Gordon L. Stüber

Principles of Mobile Communication, Third Edition, is an authoritative treatment of the fundamentals of mobile communications. This book stresses the "fundamentals" of physical-layer wireless and mobile communications engineering that are important for the design of "any" wireless system. This book differs from others in the field by stressing mathematical modeling and analysis. It includes many detailed derivations from first principles, extensive literature references, and provides a level of depth that is necessary for graduate students wishing to pursue research on this topic. The book's focus will benefit students taking formal instruction and practicing engineers who are likely to already have familiarity with the standards and are seeking to increase their knowledge of this important subject.

Major changes from the second edition:

1. Updated discussion of wireless standards (Chapter 1).
2. Updated treatment of land mobile radio propagation to include space-time correlation functions, mobile-to-mobile (or vehicle-to-vehicle) channels, multiple-input multiple-output (MIMO) channels, improved simulation models for land mobile radio channels, and 3G cellular simulation models.
3. Updated treatment of modulation techniques and power spectrum to include Nyquist pulse shaping and linearized Gaussian minimum shift keying (LGMSK).
4. Updated treatment of antenna diversity techniques to include optimum combining, non-coherent square-law combining, and classical beamforming.
5. Updated treatment of error control coding to include space-time block codes, the BCJR algorithm, bit interleaved coded modulation, and space-time trellis codes.
6. Updated treatment of spread spectrum to include code division multiple access (CDMA) multi-user detection techniques.
7. A completely new chapter on multi-carrier techniques to include the performance of orthogonal frequency division multiplexing (OFDM) on intersymbol interference (ISI) channels, OFDM residual ISI cancellation, single-carrier frequency domain equalization (SC-FDE), orthogonal frequency division multiple access (OFDMA) and single-carrier frequency division multiple access (SC-FDMA).
8. Updated discussion of frequency planning to include OFDMA frequency planning.
9. Updated treatment of CDMA cellular systems to include hierarchical CDMA cellular architectures and capacity analysis.
10. Updated treatment of radio resource management to include CDMA soft handoff analysis.

Includes numerous homework problems throughout.

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## **Editorial Review**

From the Back Cover

This mathematically rigorous overview of physical layer wireless communications is now in a third, fully revised and updated edition. Along with coverage of basic principles sufficient for novice students, the volume includes plenty of finer details that will satisfy the requirements of graduate students aiming to research the topic in depth. It also has a role as a handy reference for wireless engineers. The content stresses core principles that are applicable to a broad range of wireless standards.

Beginning with a survey of the field that introduces an array of issues relevant to wireless communications and which traces the historical development of today's accepted wireless standards, the book moves on to cover all the relevant discrete subjects, from radio propagation to error probability performance and cellular radio resource management. A valuable appendix provides a succinct and focused tutorial on probability and random processes, concepts widely used throughout the book. This new edition, revised to include the latest information on this fast-evolving subject, will be required reading for students up to graduate level, and a practical everyday tool for engineers already working in the field.

About the Author

**Dr. Gordon Stüber** has over 250 refereed publications in journals and conferences in these areas. He is author of the textbook *Principles of Mobile Communication*, Springer 2nd Edition 2001. Since 1986, he has been with the School of Electrical and Computer Engineering, Georgia Institute of Technology. He is an internationally recognized leader in wireless physical communications and wireless systems with numerous refereed publications in these areas.

## **Users Review**

**From reader reviews:**

**Paula Mendoza:**

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**Patricia Skinner:**

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