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**Sinopsis**

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Accessible comprehensive treatment of modern time series analysis  
Numerical examples present analysis of nontrivial data sets  
R code provided for ease of data analysis replication

Time Series Analysis and Its Applications presents a balanced and comprehensive treatment of both time and frequency domain methods with accompanying theory. Numerous examples using nontrivial data illustrate solutions to problems such as discovering natural and anthropogenic climate change, evaluating pain perception experiments using functional magnetic resonance imaging, and monitoring a nuclear test ban treaty. The book is designed to be useful as a text for graduate level students in the physical, biological and social sciences and as a graduate level text in statistics. Some parts may also serve as an undergraduate introductory course. Theory and methodology are separated to allow presentations on different levels. In addition to coverage of classical methods of time series regression, ARIMA models, spectral analysis and state-space models, the text includes modern developments including categorical time series analysis, multivariate spectral methods, long memory series, nonlinear models, resampling techniques, GARCH models, stochastic volatility, wavelets and Markov chain Monte Carlo integration methods. The third edition includes a new section on testing for unit roots and the material on state-space modeling, ARMAX models, and regression with autocorrelated errors has been expanded.

Also new to this edition is the enhanced use of the freeware statistical package R. In particular, R code is now included in the text for nearly all of the numerical examples. Data sets and additional R scripts are now provided in one file that may be downloaded via the World Wide Web. This R supplement is a small compressed file that can be loaded easily into R making all the data sets and scripts available to the user with one simple command. The website for the text includes the code used in each example so that the reader may simply copy-and-paste code directly into R. Appendix R, which is new to this edition, provides a reference for the data sets and our R scripts that are used throughout the text. In addition, Appendix R includes a tutorial on

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basic R commands as well as an R time series tutorial.