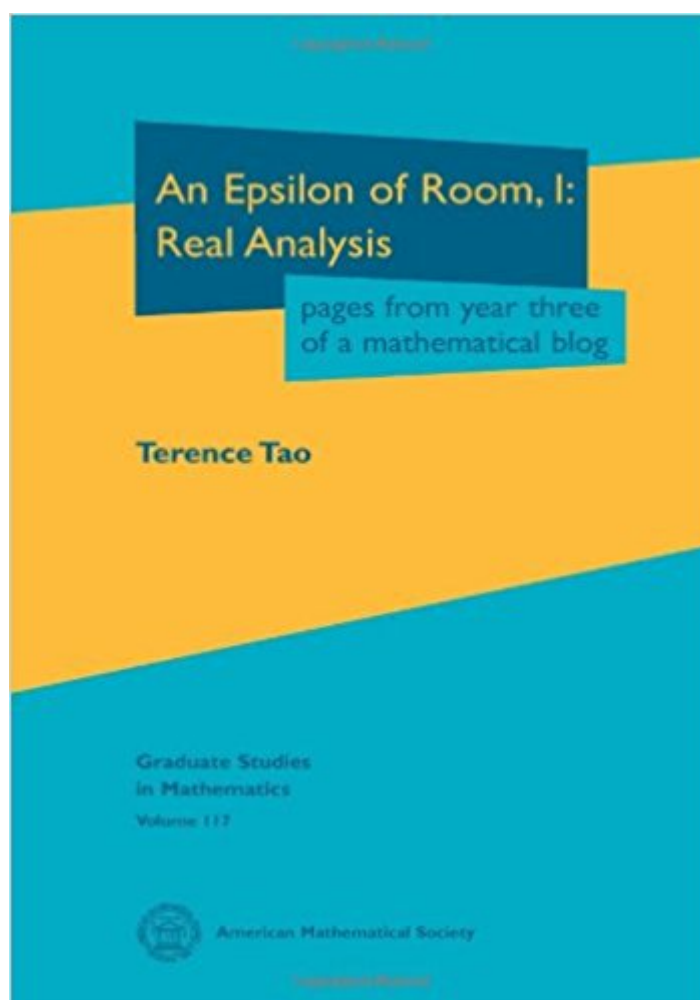


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# An Epsilon Of Room Real Analysis: Pages From Year Three Of A Mathematical Blog (Graduate Studies In Mathematics)



## Synopsis

In 2007 Terry Tao began a mathematical blog to cover a variety of topics, ranging from his own research and other recent developments in mathematics, to lecture notes for his classes, to nontechnical puzzles and expository articles. The first two years of the blog have already been published by the American Mathematical Society. The posts from the third year are being published in two volumes. The present volume consists of a second course in real analysis, together with related material from the blog. The real analysis course assumes some familiarity with general measure theory, as well as fundamental notions from undergraduate analysis. The text then covers more advanced topics in measure theory, notably the Lebesgue-Radon-Nikodym theorem and the Riesz representation theorem, topics in functional analysis, such as Hilbert spaces and Banach spaces, and the study of spaces of distributions and key function spaces, including Lebesgue's  $L^p$  spaces and Sobolev spaces. There is also a discussion of the general theory of the Fourier transform. The second part of the book addresses a number of auxiliary topics, such as Zorn's lemma, the Carathéodory extension theorem, and the Banach-Tarski paradox. Tao also discusses the epsilon regularisation argument--a fundamental trick from soft analysis, from which the book gets its title. Taken together, the book presents more than enough material for a second graduate course in real analysis. The second volume consists of technical and expository articles on a variety of topics and can be read independently.

## Book Information

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## Customer Reviews

I'm a big fan of this text. I think what makes it unique relative to other "intro. to graduate real

analysis" books is (1) how much emphasis is placed on developing an intuitive and "wholesome" picture of the major theorems in real analysis. For example, each chapter motivates the following material with examples, context and potential uses in other areas of math, and each chapter itself is interspersed with various remarks. (2) The exercises are very comprehensive and explore the surrounding results to understand boundary cases, alternative perspectives, develop heuristics, and build familiarity with the material. There are a lot of exercises in this text, and they are integral to the reading. In difficulty, they range from straightforward to relatively tricky; I've yet to come across an "unapproachable" problem, perhaps because the problems are designed to be instructive rather than purely challenging. In summary, I think this text showcases a very different style of mathematics writing than you might find in Folland and Royden, likely because it emerged from posts on Prof. Tao's blog. I'd definitely recommend that any student interested in a broad and engaging introduction to graduate real analysis should check out this book.

An earlier reviewer really gives a good description on the strength of the book. My only motivation of writing this review is to sing praises and show my support for this style of writing. It is a wonderful book. I learned analysis in the past by reading Rudin, and I liked that book very much. But Prof. Tao's text is in a totally different style. My own opinion would be that both types of textbooks have their values. I can imagine that a serious student works hard through the text and gets the most out of it. But for me, due to time constraint, I read it in a more casual manner, just flipping through the pages. Yet, I still feel that I'm benefiting a lot from the book. It helps me clear my mind and see connections that I failed to see before. Overall, wonderful book! Whether you plan to work your way through it, or like me, just casually flip through it, it will be a fun experience!

Note though, that it is a really good book to learn the theory, but it might not be the best reference book, since a part of the theory is developed in exercises.

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