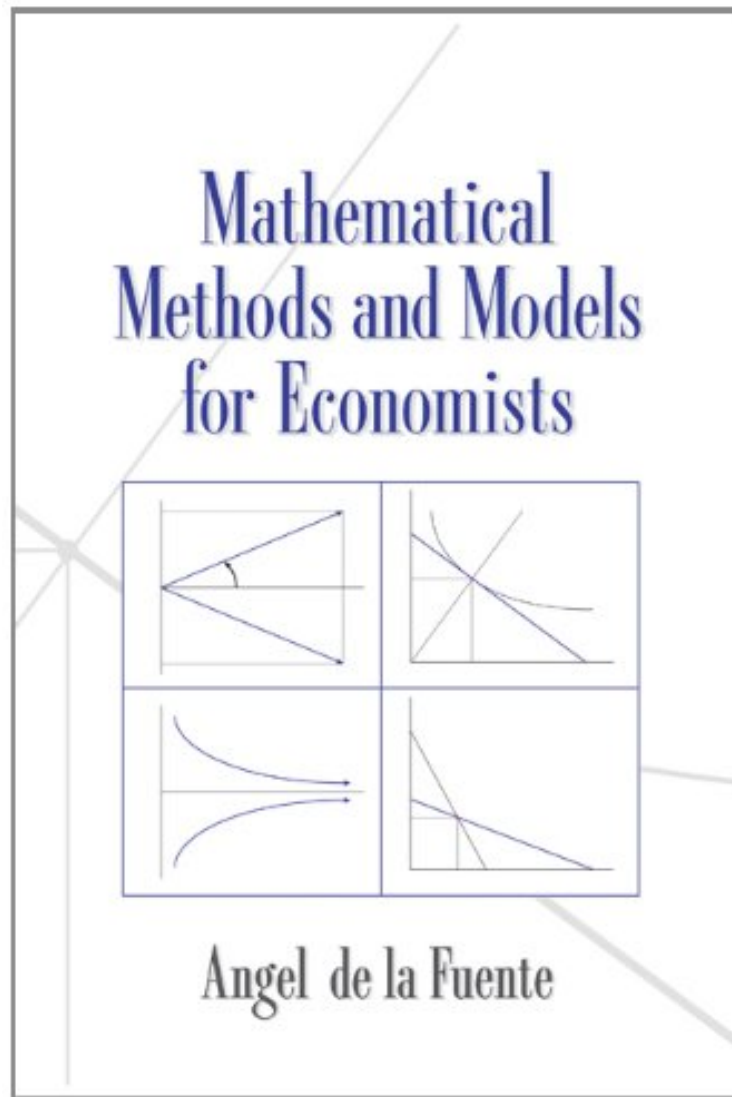


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Mathematical Methods and Models for Economists

Angel de la Fuente

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Angel de la Fuente : Mathematical Methods and Models for Economists before purchasing it in order to gage whether or not it would be worth my time, and all praised Mathematical Methods and Models for Economists:

0 of 0 people found the following review helpful. this book is good. StillBy CoffeeJust picked up this book recently, so my review is more so based on the first couple hundred pages.I have to tell you that I'm really enjoying this book so far. As someone who comes from a math background, this book does provide a fair amount of intuition--many graduate math text books are terse and don't always give you the intuition behind theorems, definitions and examples. So from that perspective, this book is good. Still, I can see where someone without much math experience may need an alternative that is less rigorous to pick up the intuition. From my experience, if you want to understand the math,

don't study anything much more advanced than what you are comfortable with. You'll be able to do the math but may not have the intuition. So my recommendation is if you have taken the following classes (or have exposure to the material), you can go ahead and start with this book: 1. Real Analysis 2. Linear Algebra (at the bare minimum you should at least have learned what a vector space, and a linear transformation and what the dimension of a Vector Space is... however if you have seen abstract algebra and not much linear algebra, you still should be good to read this book) 3. Optimization. Hopefully you have taken a class in Convex Optimization that talks about Karush Khun Tucker or something like the Simplex Method. If you haven't, I'd say start with Simon and Blume. They give more intuition and examples. The disadvantage being that it contains less advanced material. The advantage being the material that is covered has more room for understanding with plenty of examples to get intuition.

25 of 29 people found the following review helpful. A good overview By Dr. Lee D. Carlson

Mathematical economics has been around for about 175 years, although as a discipline it has only been recognized for about five decades. Professional economists have had various levels of confidence in its validity and applicability, and mathematical economists have been criticized for the esoteric nature of the mathematics they deploy and some have been ostracized from academic departments for this very reason. This book emphasizes the mathematical tools, these being primarily the theory of optimization and dynamical systems, but the author does find time to discuss applications. Some of these could be classified as "classical" applications, but some are very contemporary in their scope and intersect the work done in financial engineering. Part 1 of the book introduces the reader to the necessary background in real analysis, topology, differential calculus, and linear algebra. All of this mathematics is straightforward and can be found in many books. In chapter 5, the author considers static economic models, which are described by collections of parametrized systems of equations. The equations are dependent on parameters describing the environment and 'endogenous' variables. The goal is to find the values of the endogenous variables at equilibrium, and to find out if the equilibrium solutions are unique. In addition, it is of interest to find out how the solution set changes when the parameters are changed. This is what the author calls 'comparative statics'. Linear models are considered first, their analysis being amenable to the techniques of linear and multilinear algebra. The comparative statics for linear models is straightforward, with the shift in equilibrium as a parameter is changed readily calculated. The comparative statics of nonlinear models involves the use of the implicit function theorem, and the author derives a formula for doing comparative statics in differentiable models. The discussion here, involving concepts such as transversality, critical points, regular values, and genericity, should be viewed as a warm-up to a more advanced treatment using differential topology. The author studies static optimization in chapter 7, with the postulate of rationality assumed throughout. This allows the study of the behavior of economic agents to be reduced to a constrained optimization problem. The techniques of nonlinear programming are used to find solutions to the constrained optimization problem. Throughout this chapter one sees discussion of the ubiquitous 'agent' who is embedded in a collection of possible environments, and is able to carry out a certain collection of actions. The author finally gets to economic applications in chapter 8, wherein the author studies the behavior of a single agent under a set of restrictions imposed on it by its environment. This rather simplistic study is then generalized to the case of many interacting agents who are taken to be rational. The concept of 'equilibrium', so entrenched in economic theory and economic modeling, makes its appearance here. In a condition of equilibrium, no agent has an incentive to change its behavior, and the actions of each individual are mutually compatible. Some of the usual concepts of equilibrium are discussed in the chapter, such as Walrasian equilibrium in exchange economies, and Nash equilibrium in game theory. The (subjective) preferences of consumers are modeled by binary relations and differentiable utility functions. The differentiability allows the techniques of chapter 7 to be used. The author asks the reader to work through some examples of 'imperfect' competition at the end of the chapter. After a straightforward review of dynamical systems in chapters 9 and 10, the author discusses applications of dynamical systems in chapter 11. He begins with a discussion of a dynamic IS-LM model, using assumptions on the evolution of the money supply, the formation of expectations, and price dynamics. This model consists of two first-order ordinary differential equations, and the author studies its fixed-point structure via a standard phase-space analysis. This analysis allows the author to study the effect of a change in parameters, such as change in the rate of money creation, i.e. the effects of a certain monetary policy. Also discussed are 'perfect-foresight models', which address the difficult issue of boundary conditions in economic models based on dynamical systems. Two of these models are discussed, one is a stock price model based on the no-arbitrage principle from finance, and the other is a model of exchange-rate determination. The stock price model is the most interesting discussion in the book. It requires one to specify how expectations are formed, and, depending on how this is done, some very unexpected results occur. For example, if the agents have adaptive expectations, the author shows that the forecast error is predictable, and that agents who understand the structure of the model will have an incentive to deviate from the predicted behavior. This behavior on the part of the agents will invalidate the theory since the agents will have an incentive to compute the trajectory of prices, contrary to the assumption of the model. The author concludes that this is in direct conflict with the assumption that individuals are rational and maximize utility, i.e. that in a world without uncertainty, adaptive expectations are inconsistent with the assumption of rationality. The author avoids this problem by assuming that 'perfect foresight' holds for the agents, i.e. the agents form expectations that are consistent with the structure of the model. He shows that the assumption of perfect foresight eliminates the

inconsistency that was found in the adaptive expectations model. In the perfect foresight model, every agent uses the correct model to predict prices, and no agent has any incentive to act differently. The author then uses this model to study the response of share prices to a change in the tax rate on dividends. The rest of the chapter discusses neoclassical growth models and the software language Mathematica is introduced as a tool for solving nonlinear differential equations. I did not read the last two chapters of the book, which cover dynamic optimization and its applications, and so I will omit their review. 0 of 0 people found the following review helpful. Five Stars
By Customer
I am a first year PhD student, this book is very good

This book is intended as a textbook for a first-year PhD course in mathematics for economists and as a reference for graduate students in economics. It provides a self-contained, rigorous treatment of most of the concepts and techniques required to follow the standard first-year theory sequence in micro and macroeconomics. The topics covered include an introduction to analysis in metric spaces, differential calculus, comparative statics, convexity, static optimization, dynamical systems and dynamic optimization. The book includes a large number of applications to standard economic models and over two hundred fully worked-out problems.

'The textbook is highly recommended to graduate students of economics. Furthermore, it provides a useful mathematical reference for researchers in economics.' Roland Fahrion, Zentralblatt MATH'... an extensive introduction into the mathematic needed in the field of economics.' Simulation News Europe