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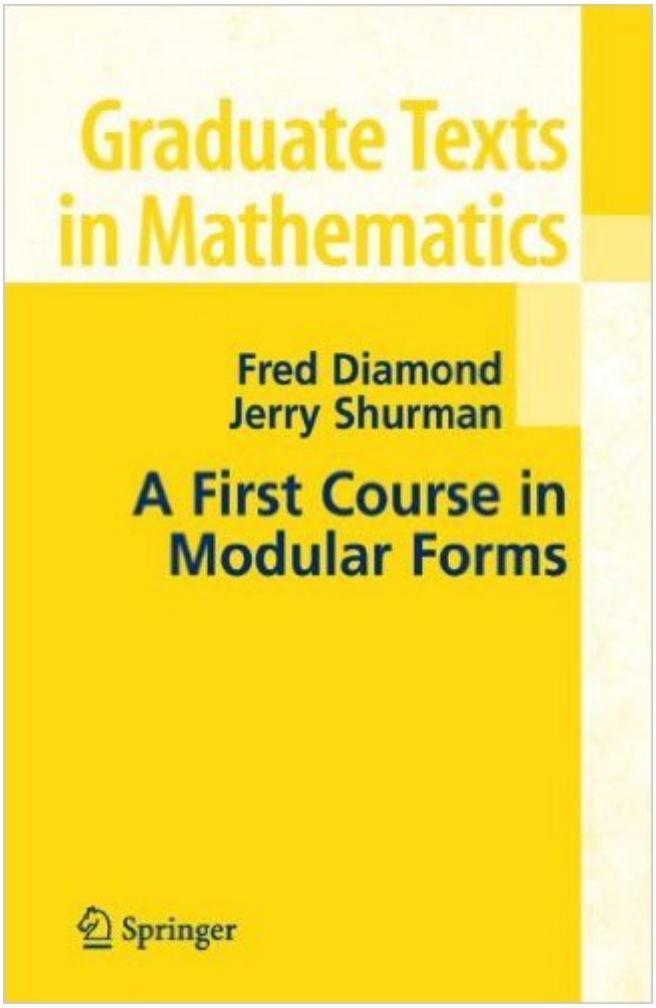
A First Course In Modular Forms (Graduate Texts In Mathematics)



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Synopsis

This book introduces the theory of modular forms, from which all rational elliptic curves arise, with an eye toward the Modularity Theorem. Discussion covers elliptic curves as complex tori and as algebraic curves; modular curves as Riemann surfaces and as algebraic curves; Hecke operators and Atkin-Lehner theory; Hecke eigenforms and their arithmetic properties; the Jacobians of modular curves and the Abelian varieties associated to Hecke eigenforms. As it presents these ideas, the book states the Modularity Theorem in various forms, relating them to each other and touching on their applications to number theory. The authors assume no background in algebraic number theory and algebraic geometry. Exercises are included.

Book Information

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Customer Reviews

this book only assumes complex analysis and simple group theory, yet manages to cover surprisingly many modern results in the theory of modular forms. the first 4 chapters present the basics, as covered in any intro to modular forms. but chapter 5 is a readable account of atkin-lehner theory from the ’70s. although it’s not discussed in this book, this theory leads directly into p-adic modular forms, an active topic in current number theory research. this is the first place i’ve seen all these results set out in one place. the proofs are similar in style to those in joe silverman’s books on elliptic curves, although they are perhaps little more terse in this book (which i prefer). some of the material is presented in (actually!) straightforward exercises, for which there are ample hints at the

back.i haven’t read the the second half of the book yet, but apparently it aims to "explain" the modularity theorem. i don’t know what they put in and what they leave out, but at the very least it seems like it would be a good starting place if you want to find out about L-functions, another important topic in current number theory research.there’s the odd bamboozling typo, but that’s pretty standard for the springer GTM’s, but other than that it’s very solid, and i would say the perfect companion to silverman’s books, as the starting point in a number theory/arithmetic geometry library,

I purchased this text as a companion with Koblitz to get a sense of modular forms and elliptic curves beyond Silverman and Tate. So far the first 3 chapters are a good fit with the other two texts. It is slow going but worth the effort.I also especially want to commend for providing this text in the Print Replica format which preserves the appearance of the mathematical content without the many unsatisfactory artifacts that occur when the usual Kindle/mobi format is used for technical material.

Best introductory book on the topic!

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