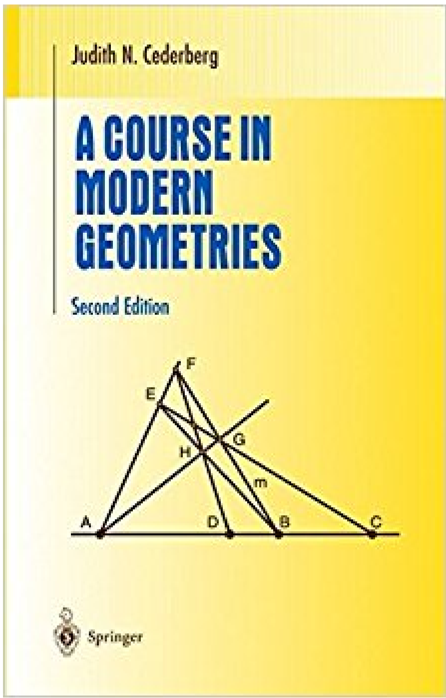
A Course In Modern Geometries (Undergraduate Texts In Mathematics)



Synopsis

Designed for a junior-senior level course for mathematics majors, including those who plan to teach in secondary school. The first chapter presents several finite geometries in an axiomatic framework, while Chapter 2 continues the synthetic approach in introducing both Euclids and ideas of non-Euclidean geometry. There follows a new introduction to symmetry and hands-on explorations of isometries that precedes an extensive analytic treatment of similarities and affinities. Chapter 4 presents plane projective geometry both synthetically and analytically, and the new Chapter 5 uses a descriptive and exploratory approach to introduce chaos theory and fractal geometry, stressing the self-similarity of fractals and their generation by transformations from Chapter 3. Throughout, each chapter includes a list of suggested resources for applications or related topics in areas such as art and history, plus this second edition points to Web locations of author-developed guides for dynamic software explorations of the PoincarÃƒÂ© model, isometries, projectivities, conics and fractals. Parallel versions are available for "Cabri Geometry" and "Geometers Sketchpad".

Book Information

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Customer Reviews

Second Edition J. N. Cederberg A Course in Modern Geometries "CederbergÃ¢â ¬â„¢s book has the virtue of exceptionally clear exposition and at the same time, it is brief enough not to exhaust oneÃ¢â ¬â„¢s patience . . . I have seen hundreds of college-level texts on geometry and this is one of the handful I like the most." Ã¢â ¬â ¢THE UMAP JOURNAL

Great for learning introductory geometry at the advanced level. The book is concise and thorough, the proofs given are clear and easy to follow.

I chose this book to replace the official textbook for a course where we had been using Blau’s Foundations in Geometry (which I was not entirely satisfied with.)From , I was able to look at some excerpts from the first chapter which impressed me, so I ordered the text for the class.The first chapter is well written and talks about the importance of models in showing consistency and independence of axioms. it contains some nice examples.After that the book more or less falls apart. Chapter 2 talks about the inadequacies of Euclids original axiomatic system and then refers to some possible other axiomatic systems in appendices. In the second section of Chapter 2 while Euclid’s problems are being discussed, there is an exercise to show that Pasch’s Axiom 1 and 2 are equivalent. The exercise is impossible because the author has not defined what it means to be interior to a triangle, or even remotely addressed the issue.For the remainder of Chapter 2, the author abandons any axiomatic framework at all and just proves various theorems about Eucilidean and hyperbolic geometry. Since axioms are not stated and terms are not adequately defined, I am not sure what the author is doing in this Chapter. To be honest, I think she is doing nothing at all. The chapter ends with an intuitive discussion of elliptic geometry.Chapter 3 talks about geometric transformations of the Euclidean plane. It is also full of imprecise definitions, impossible exercises, and other issues. For example, in Definition 3.10 the author states "A group of transformations that keep a given line c invariant and whose translations form an infinite cyclic subgroup is known as a _frieze group_ with axis c. A point set that remains invariant under a frieze group with axis c is called a _frieze pattern_ with axis c anf denoted F_c. (Note: A frieze group is the symmetry group of the associated frieze pattern.)"Well, which is a frieze pattern then? In the exercises, exercise 4 asks the student to explain why a frieze pattern cannot have rotational symmetry for theta other than 0 degrees or 180 degrees. Of course, under the definition given, the set of all points in the plane with integer coordinates is a frieze pattern and it does have 90 degree rotational symmetry. Yes, the *full* group of translations of the points in the plane with integer coordinates is not infinite cyclic, but it is a point set which remains invariant under a translational action by the integers and is thus a frieze pattern by the authors definition.As another example, in section 3.7 the author defines congruence and line segments. Then as an exercise readers are asked to show that if segment PQ is congruent to segment P’Q’, then the measures of the line segments d(P,Q) and d(P’,Q’) are equal. Nowhere is it mentioned that this is somewhat tricky given how the author has defined things. I believe readers are "supposed" to give a proof that follows something like this: Since segment PQ is congruent to segment P’Q’, there is an isometry T from one set to the other. So either T(P)=P’, T(Q)=Q’ or T(P)=Q’, T(Q)=P’. In either case, since T is an isometry d(P,Q)=d(T(P),T(Q)), and the result follows after a little work. But this of course is completely inadequate and we do not know that T(P) is also an endpoint of segment P’Q’ without more work. In fact, the quickest proof of the exercise would probably not end out following this approach at all.These are just some small examples, but the book is full of issues like this. It seems to employ very sloppy reasoning, very sloppy definitions, and either ridiculously complicated or ridiculously simple exercises. I am not sure what audience the author is trying to aim the book at. The back of the book says "[It] is designed for a junior- to senior-level course for mathematics majors." I think it would be horrible as such a text. I was trying to use it for a class aimed at mathematics education majors, and found it horrible for that use. I strongly encourage you not to adopt this textbook.

The book was broken in half when it arrived. It was not because of delivery.

I studied Dr. Cederberg’s text a while ago while I was at St. Olaf College. Being an ambitious youth, I was always trying to seek out the "best" book in a field to study. However, it’s certainly difficult to learn from the masters if one doesn’t have a solid background in the basic materials. I learned Calculus from G. Hardy’s "Pure Math" but found it extremely difficult to comprehend (though it was a rewarding try). Then I turned to Spivak for a more modern treatment. In geometry, I went the opposite way: studying Cederberg’s book first before moving to the more advanced one. I like her clear presentation and especially the part on matrix representations of groups of transformations. This book would be a valuable source for teachers of geometry.

This book is the worst book that my professor has ever chose for my math class. The definitions and theorems in this book has lack of explanations, and there are very few examples. But also the solutions of the examples doesn’t make sense at all(especially on chapter 3). I want to tell my professor not to get this book for students in future. I really hate this book.

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