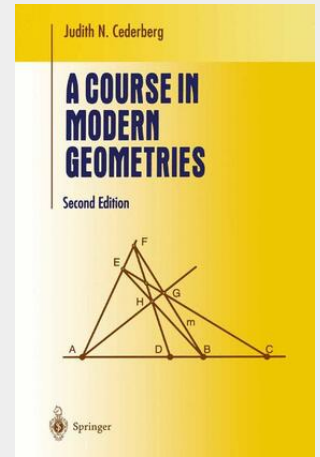


Cederberg

## A Course in Modern Geometries

A Course in Modern Geometries is designed for a junior-senior level course for mathematics majors, including those who plan to teach in secondary school. Chapter 1 presents several finite geometries in an axiomatic framework. Chapter 2 continues the synthetic approach as it introduces Euclid's geometry and ideas of non-Euclidean geometry. In Chapter 3, a new introduction to symmetry and hands-on explorations of isometries precedes the extensive analytic treatment of isometries, similarities and affinities. A new concluding section explores isometries of space. Chapter 4 presents plane projective geometry both synthetically and analytically. The extensive use of matrix representations of groups of transformations in Chapters 3-4 reinforces ideas from linear algebra and serves as excellent preparation for a course in abstract algebra. 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. Each chapter includes a list of suggested resources for applications or related topics in areas such as art and history. The second edition also includes pointers to the web location of author-developed guides for dynamic software explorations of the Poincaré model, isometries, projectivities, conics and fractals. Parallel versions of these explorations are available for "Cabri Geometry" and "Geometer's Sketchpad". Judith N. Cederberg is an associate professor of mathematics at St. Olaf College in Minnesota.

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