



Springer

1st  
edition1st ed. 2019, XI, 332 p. 701  
illus., 699 illus. in color.**Printed book**

Hardcover

**Printed book**

Hardcover

ISBN 978-3-319-98745-3

£ 79,99 | CHF 106,50 | 89,99 € |  
98,99 € (A) | 96,29 € (D)

Available

**Discount group**

Standard (0)

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# Structures: A Geometric Approach

Graphical Statics and Analysis

- A single textbook that teaches graphic statics with a 21<sup>st</sup> century approach
- Techniques to inspire students of architectural engineering and architecture and structural engineering
- A comprehensive resource for two and three-dimensional graphical analyses of structures
- Numerous exercises and step-by-step solutions to problems that guide students as well as instructors and practitioners of structural engineering
- Detailed guides to using a parametric drawing tool

Graphic methods for structural design essentially translate problems of algebra into geometric representations, allowing solutions to be reached using geometric construction (ie: drawing pictures) instead of tedious and error-prone arithmetic. This was the common method before the invention of calculators and computers, but had been largely abandoned in the last half century in favor of numerical techniques. However, in recent years the convenience and ease of graphic statics has made a comeback in architecture and engineering. Several professors have begun using graphic statics in the classroom and studio environment. But until now, there had been no guidebook that rapidly brings students up to speed on the fundamentals of how to create graphical solutions to statics problems. Graphic Statics introduces all of the traditional graphic static techniques in a parametric drawing format, using the free program GeoGebra. Then, advanced topics such as indeterminate beams and three dimensional curved surfaces are covered. Along the way, links to wider design ideas are introduced in a succinct summary of the steps needed to create elegant solutions to many static equilibrium problems. Meant for students in civil and architectural engineering, architecture, and construction, this practical introduction will also be useful to professionals looking to add the power of graphic statics to their work.

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ISBN 978-3-319-98745-3 / BIC: TN / SPRINGER NATURE: SCT23004

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