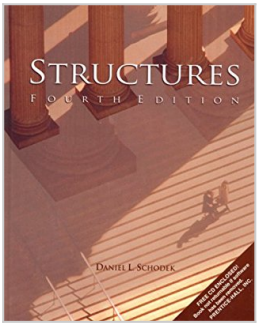


# Structures (4th Edition)

*By Daniel L. Schodek*



**Structures (4th Edition)** By Daniel L. Schodek

For sophomore/junior-level courses in Structures or Structural Analysis and Design.Comprehensive and flexible, this text offers single-volume coverage of all major topics in structural analysis and design--with particular focus on structural behavior and design issues. It begins with a self-contained, non-mathematical overview of the fundamental concepts of analysis and design, and then examines, individually, the common structural types used in buildings (e.g., trusses, beams, arches/cables)--discussing each in terms of both qualitative and quantitative analysis and then design methods--all illustrated with example analyses of real structures. A unique discussion of the logic of structural design as a part of the larger building design process concludes this treatment.

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## Editorial Review

Review

"This is a good text, and I think far outstrips many competing texts. I always recommend my students buy this text for the course and to use it in the future as a well-illustrated text that deals with most of the key issues and goes beyond to show how the principles of structural design are incorporated into practice." — Harry Giles, *University of Michigan*

"It is overall a very interesting text, addressing architecture students and design issues that go beyond stress and strain. It deals with typology, morphology, and configuration, which few texts are able to do. In this sense it spans engineering and architecture very well. The illustrations are great, and they are exactly what they should be in a book that is about principles. They are clear, well-drawn, well related to the text." — Michele Chiuini, *Ball State University*

From the Publisher
An introductory structures text which covers the primary structural elements used in buildings, and discusses their analysis and design. Appropriate for architecture and civil engineering students, as well as practicing architects and engineers.

From the Inside Flap
Preface

There exists an invariant set of physical principles founded in the field of mechanics that can be used by designers as aids to understanding the behavior of existing structural forms and in devising new approaches. The development of these principles has flowered during the past three centuries to the extent that they are amazingly well established and documented. Some new understandings, of course, are continuing to occur and will hopefully always occur. Still, the analytical tools already available to the designer are extensive and enormously powerful. This is true to the extent that the real challenge in the field of structures lies not so much in developing new analytical tools but in bringing those currently in existence to bear in the designing and formulation of creative structural solutions with the intent of making better buildings.

In this book we discuss in an introductory way the nature of the invariant physical principles that underlie the behavior of structures under load. The primary goal of the book, however, is not simply to teach analytical techniques but, more generally, to explore their role in the design of structures in a building context. Because of this larger goal, the book covers material discussed not only in specialized engineering curricula but also, to some extent, that covered in architecture curricula as well. The traditional hard boundaries between subdisciplines in engineering (e.g., statics and strength of materials) have also been deliberately softened and a more integrative approach taken.

The book is divided into three major parts. Part I is an introduction to the subject and to fundamental concepts of analysis and design. Part 11 introduces the reader to most of the primary structural elements used

in buildings and discusses their analysis and design. Each of the chapters in this part is divided into sections that (1) introduce the element considered and explain its role in building, (2) discuss its behavior under load in qualitative terms (an "intuitive" approach), (3) examine its behavior under load in quantitative terms, and (4) discuss methods for designing (rather than just analyzing) the element. Part III contains a unique discussion of the logic of structural design, as it is a part of the larger building design process. The Appendices generally discuss more advanced principles of structural analysis.

The book is intended largely as a resource for students and instructors wishing to design their own curriculum. For those wanting to adopt a strictly qualitative approach to the subject, for example, it is possible to read only Chapter 1 in Part I, the sections entitled "Introduction" and "General Principles" in each of the chapters in Part II, and all of Part III. This coverage will provide a brief qualitative overview of the field with a special emphasis on design rather than analysis. For those students who already have a background in the analytical aspects of structures, Part III contains summary information useful in a design context. Part III can be read independently by such students.

Within Parts I, II, and III there is a certain redundancy in the way analytical topics are covered so that students or instructors can integrate the material in the order they see fit. Shear and moment diagrams, for example, are first introduced in an abstract way in Chapter 2. They are reintroduced in connection with the analysis of a specific structural element—the truss. Where the different presentations are introduced, if at all, may be varied by the instructor. The author, for example, typically chooses to introduce shear and moment diagrams initially as a part of truss analysis and then follow up with the more abstract development of shear and moment diagrams in Chapter 2 before going into beam analysis and design. Other instructors may choose to approach the subject material differently. The book is designed to have sufficient flexibility to support different approaches. In any event, the material is presented in such a way that a direct cover-to-cover reading is also appropriate.

The author is, of course, indebted to a vast number of people in either a direct or an indirect way for the approach taken in this book. Professor Spiro Pollalis contributed his time and help in revising the manuscript and in preparing the accompanying student CD which contains examples and case studies. The endless patience and contributions of several years of students in the Graduate School of Design at Harvard who have taken courses involving the material contained herein are also greatly appreciated. Especially important are Kay, Ned, and Ben Schodek, who provided their own special form of support. Thanks also to the reviewers of this edition for their helpful comments and suggestions: James W. Axley, Yale University; and Kurt G. Benedict, Wentworth Institute of Technology.

Daniel L. Schodek
Cambridge, Massachusetts

## Users Review

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**Eva Burton:**

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