

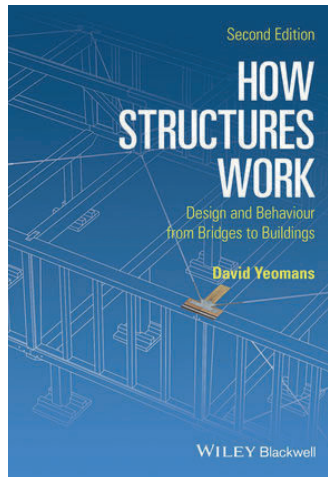
Review



Tianjian Ji finds this introduction to building structures to be aimed primarily at architectural students, although it will also make suitable supplementary reading for first-year civil and structural engineering students.

How Structures Work: Design and Behaviour from Bridges to Buildings (2nd ed.)

Author: David Yeomans
Publisher: Wiley-Blackwell
Price: £37.50 (paperback); £33.99 (E-book)
ISBN: 978-1-119-01227-6



easily understood and are memorable.

4. It demonstrates how to use knowledge of structural behaviour to explain the behaviour of existing structures and the causes of structural failures. The purpose of learning and understanding is for future application. It appears helpful and interesting to use real structures to learn about structural behaviour and to use structural knowledge to explain the behaviour of real structures.

The book contains a number of line drawings to illustrate structures, structural behaviour and qualitative analysis. Sometimes, figures are presented in pairs to compare the differences between the two and to provide a better understanding. Some concepts and definitions are provided in “elements of grammar” and the glossary at the end of this book, which will be helpful to the reader. Framed grey areas in the book highlight the insertions, such as examples and explanations. Perhaps reading this book could have been more enjoyable if the text font had been a bit larger.

The book is also suitable for first-year civil and structural engineering students as supplementary reading. After learning buckling from this book, they would establish an intuitive understanding that a longer compression member carries fewer loads for the same cross-section, which may help them to reach a conceptual understanding that the buckling load is inversely proportional to the column length squared in their later studies.

Dr Tianjian Ji FIStructE, CEng

Tianjian Ji is a Senior Lecturer in Structural Engineering at the University of Manchester. He is an author of *Understanding and Using Structural Concepts*, published in 2016.

This book is written for architectural students and for those who have a limited mathematics background, but want to understand the basics of building structures. Therefore, the approach used by the author to illustrate the basics of structures is different from that used in traditional textbooks. In this book, structural ideas are illustrated using simple examples and these ideas are then used to explain the behaviour of much more complex real structures, often well-known historical structures.

This new edition includes a new chapter on construction materials and a revision of the existing nine chapters; it has about 250 pages. The contents of the book relate to that found in courses on mechanics of materials, analysis of structures and design in civil engineering.

This book has four features that make it different from others:

1. The contents of the book are presented intuitively and descriptively, only involving limited calculations. Consider a statically determinate truss structure – a member in tension, or compression, is judged by the author through imagining the possible deformation, or failure pattern, when this member is removed from the truss. If the two nodes that are linked by the member move

apart from each other, the member is in tension; when they move closer, the member is in compression. This makes the judgement simple and straightforward, and is ideally suited for architectural students who have a good imagination.

2. Many historical structures are used to illustrate structural ideas and their uses. It is of interest to see these examples which were constructed before the use of computers. The examples include the Forth Bridge as a successful story, the Quebec Bridge as a story of failure and the Blackfriars Bridge that brought many debates about its structural form at that time. This provides knowledge about the history of buildings in addition to structural behaviour.

3. A story-like presentation is often used. In the chapter on frames, the Crystal Palace is used as an example, it being one of the earliest iron-framed structures. In addition to talking about the building from design to construction like a story, the author covers the technical contents of stability, rigid connections, bolts used for preventing rotation, effects of temperature and material characteristics of cast iron etc. Although these topics are lightly covered, they are