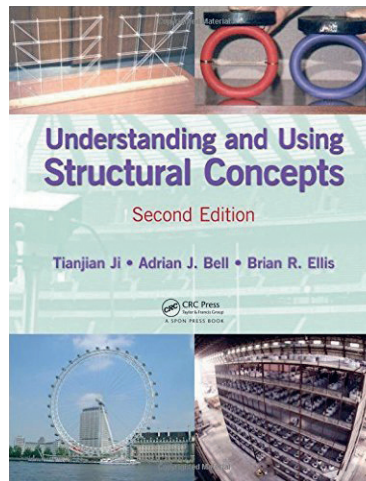


Review



Peter Bullman finds this to be an excellent book in which concepts are presented with admirable simplicity and clarity. However, it is let down by poor production, with low-quality illustrations and numerous typographical errors.

Understanding and Using Structural Concepts (2nd ed.)



Authors: Tianjian Ji, Adrian J. Bell and Brian R. Ellis

Publisher: CRC Press

Price: £44.99 (paperback); £31.49 (E-book)

ISBN: 978-1-498-70729-9

This is an excellent book. The authors are well known for their use of physical models to demonstrate structural concepts and this book will make their ideas more widely available. Advice on how students, lecturers and practising engineers can best use the book is included.

The book defines a structural concept as "...a qualitative and concise representation of a mathematical relationship between physical quantities... [which has] practical applications in structural engineering". Reducing structural behaviours to these simple concepts is a powerful learning tool.

Most chapters are about a single structural concept and are set out in the same way with:

- definition
- theory
- model demonstration
- practical examples
- questions

Often two models are shown to illustrate "difference seen and felt". Early chapters are about basic concepts such as equilibrium, centre of mass, stress distribution, bending, buckling, shear and torsion. Later chapters cover more advanced topics, and three chapters are intended as lecture material. The final chapter discusses the integration of

theory and practice.

The amount of theory presented varies a lot between the chapters. The chapter which discusses the tied ring shown on the cover of the book includes full working over several pages, while other chapters cover more complex theory in a few lines without showing the working. It is not clear why the authors chose to do this, though the missing working is available in the quoted references.

"REDUCING STRUCTURAL BEHAVIOURS TO THESE SIMPLE CONCEPTS IS A POWERFUL LEARNING TOOL"



The authors note that students are motivated by "hands-on" experience, so the best use of the book will be by those who make the models illustrated and can physically feel the effects. However, it is certainly possible to gain understanding of the concepts by studying the illustrations, which show how the models behave.

The later chapters cover structural vibrations, especially when humans and structures interact, and the interdependence

of static and dynamic behaviour is dealt with well. This reflects the research interests of the authors and is more specialised than the concepts in the earlier chapters, so it will not be of interest to all readers. Perhaps there are really two books here: one for all engineers and one more specialised. In all chapters, the method of presentation sets a challenge for other researchers to present their own findings with the same simplicity and clarity.

Sadly, the production of the book does not do justice to the contents. Many of the illustrations are of poor quality with low contrast, and some have distracting backgrounds behind the models which makes it difficult to pick out the important details. The reviewer's copy had extraneous vertical white lines through many of the illustrations. Better-quality versions of the same illustrations can be seen on the authors' website: www.structuralconcepts.org. In addition, there are too many typographical errors, omissions and mistakes in working. These faults mean that the reader sometimes has to work hard to get the best from the text, but the effort is worthwhile.

Peter Bullman

Peter Bullman worked for Felix J. Samuely and Partners, Taylor Woodrow Construction and Building Design Partnership before joining what is now the University of Bolton to lecture on structural engineering. He is now retired.