

## Book review

**Fundamentals of rock mechanics, 4th edn.** J. C. Jaeger, N. G. W. Cook and R. W. Zimmerman. Oxford: Wiley-Blackwell Publishing, 2007. 488 pp. ISBN 978-0-632-05759-7. £37.50

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This is the long awaited update of the third edition of this classic text, last published in 1979. This text provides the underpinning mathematical theory for many topics in rock mechanics. Tensor analysis and continuum mechanics are used extensively, covering applications in underground construction, mining, geophysics, nuclear waste storage and petroleum engineering. Previous editions have often been cited in papers to provide the authoritative underlying theory, leaving the authors free to develop further their own particular arguments.

The layout of the text is clear and the sequence of development logical, having changed from previous editions in some respects. References are used to guide the reader to the source material and to provide guidance for further reading where space has not allowed full development of a topic.

Over half the references are new and have been published since 1979, which is not surprising in this rapidly developing subject. A very good point is the use of book and journal references that are normally accessible through university libraries, rather than quoting conference proceedings and reports. The units used are mainly SI and the sign convention used is common to soil and rock mechanics.

I tested the book during the preparation of this review, looking up what has developed in areas of particular interest to me; I found that it did not let me down with well chosen, up-to-date references. I would certainly recommend this text to research students and practicing engineers in rock mechanics; it is not what I would consider to be a teaching text, lacking worked examples and end of chapter problems to check the reader's understanding, however it does not claim to be such a text.

The initial chapters follow a conventional form with the basics of stress and strain analysis in two and three dimensions, common failure criteria and laboratory testing. The chapters on poroelasticity and thermoelasticity are particularly welcome. Chapter 12 on hydromechanical behaviour of fractures is new to this text and the chapter on wave propagation in rock materials is greatly expanded from the third edition.

The addition of Robert Zimmerman to the authors builds on the practice of having the leading authorities in the subject author this book. Professor Zimmerman is the current Editor-in-Chief of the well regarded *International Journal of Rock Mechanics and Mining Sciences*.

I confidently expect this edition to become the standard work for rock mechanics theory and will be a welcome addition to any rock practitioner's bookshelf.

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*Géotechnique Advisory Panel*