agnostic tools to include disease symptoms and immunoassays would have enriched the encyclopedia. Rearrangement of chronological order of the sections to present chapters on crop diseases, pathogenesis and host defence mechanisms immediately after causal organisms could have enhanced the continuity of introductory descriptive passages on diseases and pathogens. These chapters would then have preceded sections on practical aspects related to diagnosis, epidemiology, forecasting models and disease management.

Vidhyasekaran deserves to be commended for his efforts in bringing out this publication, which will serve as an useful resource book and a valuable companion for researchers, students, extension workers and all stakeholders of pest management. The book is a must buy for libraries, plant pathologists and researchers from allied subjects.

K. R. KRANTHI

Central Institute for Cotton Research,
P.B. No. 2, Shankarnagar PO,
Nagpur 440 010, India
e-mail: krkanthi@satyam.net.in

An Introduction to Linear and Nonlinear Finite Element Analysis – A Computational Approach. Prem K. Kythe and Dongming Wei. Birkhauser, Boston. 2004. 445 pp. Price not stated.

Finite element analysis (FEA) is now half a century old. It is considered to be one of the great achievements of the last century in mechanical engineering and one cannot now think of a major engineering project where FEA does not play a central role. Its reach has gone beyond traditional engineering practice and FEA is now used extensively in physics, geophysics and applied mathematics. There are several hundred industry-standard commercial packages and an equally large number of excellent textbooks.

This new addition aims to address one more niche – that occupied by the new generation of students who are familiar with the latest computers and with computational tools like Mathematica and Matlab and industry-standard packages like Ansys. It is clear, as the authors express in their preface, that the book has evolved out of their recent teaching of two back-to-back courses on the finite element method covering linear and nonlinear analysis, straddling both the senior undergraduate and graduate classes.

The authors have attempted to cover a wide range of problems that can be solved by the finite element method. The chapters are logically structured to reflect the increasing complexity of the problems. After the customary introduction to the history of the finite element method and the weak variational and weighted residual formulations in chapter 1, the authors discuss one-dimensional problems in the next three chapters. Chapters 5 to 7 introduce many two-dimensional problems, and cover a range of topics like heat transfer, torsion, seepage and fluid flows. Axisymmetric FEA is explained through a heat transfer problem in chapter 8. Linear transient problems are discussed in chapter 9. Nonlinear problems which involve only a single nonlinear differential equation with one unknown are treated in chapter 10. The authors return to the linear problems of plane elasticity in chapter 11, and fluid-flow problems in chapter 12. Applications of FEA to vibration problems are discussed in chapter 13. Use of FEA in solving typical problems with commercial software is dealt with in chapter 14. An excellent feature is the collection of six appendices at the back of the book.

The mathematical aspects of FEA are brought out in a concise and lucid manner. Ample practical examples from many engineering applications are given throughout the book. Engineers outside the professions of mechanical, civil and aerospace engineering – the major users of FEA – would be much at ease with the manner in which the subject has been introduced. Each chapter has at the end, many interesting exercise problems. Most of these problems can be solved by hand, with minimal recourse to programming. Although the title of the book specifically mentions nonlinear finite element analysis, only a single chapter with a few examples addresses this important emerging area.

The presentation is compact and neat, and good illustrations profusely support the text. It is also a sign of the maturity of the finite element method that this book is intended for use as supporting a service course or two at the undergraduate and graduate level, with emphasis on interdisciplinary applications. Earlier, books were designed with specific specialized audiences in mind and thereby, with pointed reference and applications to a particular field of engineering or applied science.

GANGAN PRATHAP

CSIR Centre for Mathematical
Modelling and Computer Simulation
Bangalore 560 037, India
e-mail: gp@cmmacs.ernet.in