Introduction to the Finite Element Method: Theory, Programming and Applications

By Erik G. Thompson

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This text presents an introduction to the finite element method including theory, coding, and applications. The theory is presented without recourse to any specific discipline, and the applications span a broad range of engineering problems. The codes are written in MATLAB script in such a way that they are easily translated to other computer languages such as FORTRAN. All codes given in the text are available for downloading from the text's Web page, along with data files for running the test problems shown in the text. All codes can be run on the student version of MATLAB (not included).

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Editorial Review

From the Back Cover
The right balance of theory, programming, and applications

Erik Thompson presents the theory, applications, and programming skills you'll need to understand the finite element method and use it to solve problems in engineering analysis and design. Offering concise, highly practical coverage, this introductory text presents complete finite element codes that can be run on the student version of MATLAB or easily converted to other languages.

Master the basic theory: The text promotes an understanding and appreciation of the theoretical basis of finite element approximations by building on concepts that are intuitive. Throughout, the text uses matrix notation to help you visualize the finite element matrices. Study problems reinforce basic theory.

Experiment with the code: Numerical experiments show how to test programs for possible errors, experiment with boundary conditions, and study accuracy and stability. Code development exercises suggest ways to modify the codes to create additional capabilities. All codes are available on the book's web page along with sample data files for testing them. Each code can be immediately run using only the student version of MATLAB. Because each code is written using explicit programming, they also serve as pseudo-codes that can be used to develop programs in any computer language.

Gain hands-on experience: Projects, representing a wide variety of engineering disciplines, enable you to conduct analyses of fairly complex problems. Many of these projects encourage you to investigate new techniques for using the finite element method.

Users Review

From reader reviews:

Karen Jude:

As people who live in the particular modest era should be upgrade about what going on or information even knowledge to make these people keep up with the era which is always change and make progress. Some of you maybe can update themselves by reading through books. It is a good choice to suit your needs but the problems coming to an individual is you don't know what one you should start with. This Introduction to the Finite Element Method: Theory, Programming and Applications is our recommendation to make you keep up with the world. Why, because book serves what you want and wish in this era.

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