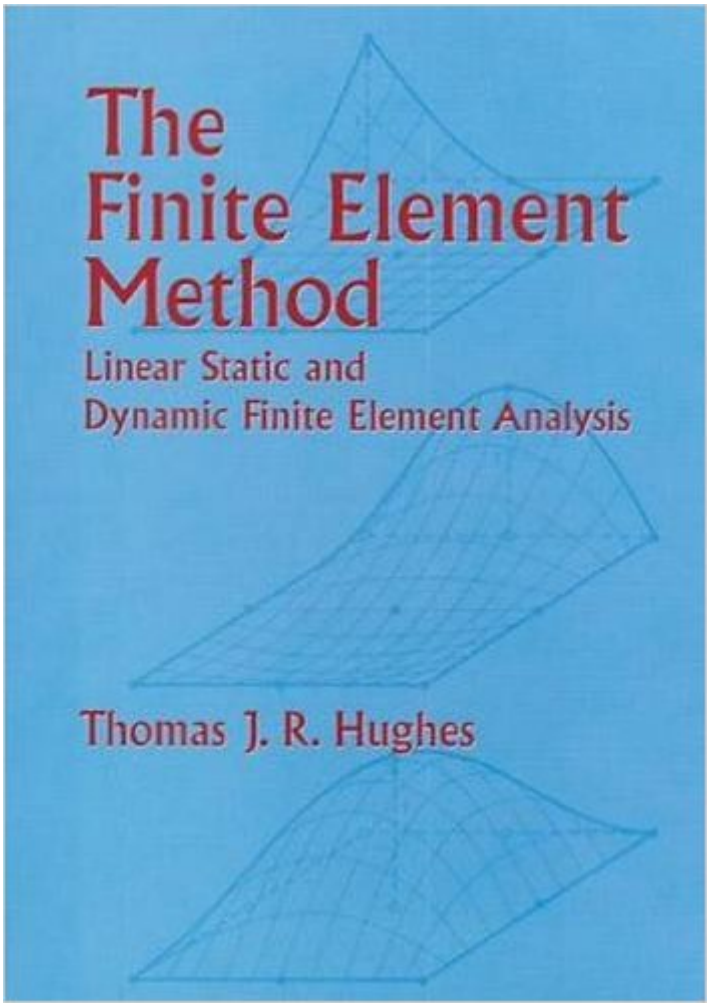
The Finite Element Method: Linear Static And Dynamic Finite Element Analysis (Dover Civil And Mechanical Engineering)



Synopsis

This text is geared toward assisting engineering and physical science students in cultivating comprehensive skills in linear static and dynamic finite element methodology. Based on courses taught at Stanford University and the California Institute of Technology, it ranges from fundamental concepts to practical computer implementations. Additional sections touch upon the frontiers of research, making the book of potential interest to more experienced analysts and researchers working in the finite element field.In addition to its examination of numerous standard aspects of the finite element method, the volume includes many unique components, including a comprehensive presentation and analysis of algorithms of time-dependent phenomena, plus beam, plate, and shell theories derived directly from three-dimensional elasticity theory. It also contains a systematic treatment of "weak," or variational, formulations for diverse classes of initial/boundary-value problems.Directed toward students without in-depth mathematical training, the text incorporates introductory material on the mathematical theory of finite elements and many important mathematical results, making it an ideal primer for more advanced works on this subject.

Book Information

Series: Dover Civil and Mechanical Engineering

Paperback: 704 pages

Publisher: Dover Publications; 1 edition (August 16, 2000)

Language: English

ISBN-10: 0486411818

ISBN-13: 978-0486411811

Product Dimensions: 6.5 x 1.3 x 9.2 inches

Shipping Weight: 2.1 pounds (View shipping rates and policies)

Average Customer Review: 4.3 out of 5 starsÂ Â See all reviewsÂ (37 customer reviews)

Best Sellers Rank: #45,648 in Books (See Top 100 in Books) #17 inÂ Books > Science & Math > Mathematics > Mathematical Analysis #17 inÂ Books > Textbooks > Engineering > Civil Engineering #103 inÂ Books > Engineering & Transportation > Engineering > Mechanical

Customer Reviews

This is the only book I consider a good introduction to Finite Elements. I found all the others have one or more severe shortcomings that leave out essential material. I’m sure they have different readers in mind, but.. this book is the only one that makes logical sense to me in how it is structured:- Explain the concept: Reformulate differential equations problem using a weak

formulation (Galerkin-Ritz), then approximate with basis functions around the Nodes.- Explain IN DETAIL the construction of the element shape functions: You actually don't need the concept of 'element' at all for the Galerkin method. The only time this comes up is when you look at how good the approximation is, and for this you group the local basis functions into 'elements' to see the effect across boundaries. If you haven't done FE before, you have never come across this anywhere else, so this is a new thing, and the devil is in the detail and takes some getting used to. Yet I swear this is the ONLY book I found that actually explains the shape functions properly. Very disappointed with the FE community for all this junk out there.I love how in the examples this book takes up the continuum mechanics equations properly, in their pure form (tensors), without trying to derive ad-hoc certain 'virtual work equations', which is BS. The 'virtual work' equation is the weak formulation of the motion equilibrium equation. I guess that's what you get when you start with beams and plates. Hughes sticks to explaining what the book is about, FE concepts, and doesn't go on a tangent like most other books trying to deduce some physics instead of teaching FE.

Design Process (Mcgraw-Hill Series in Mechanical Engineering)