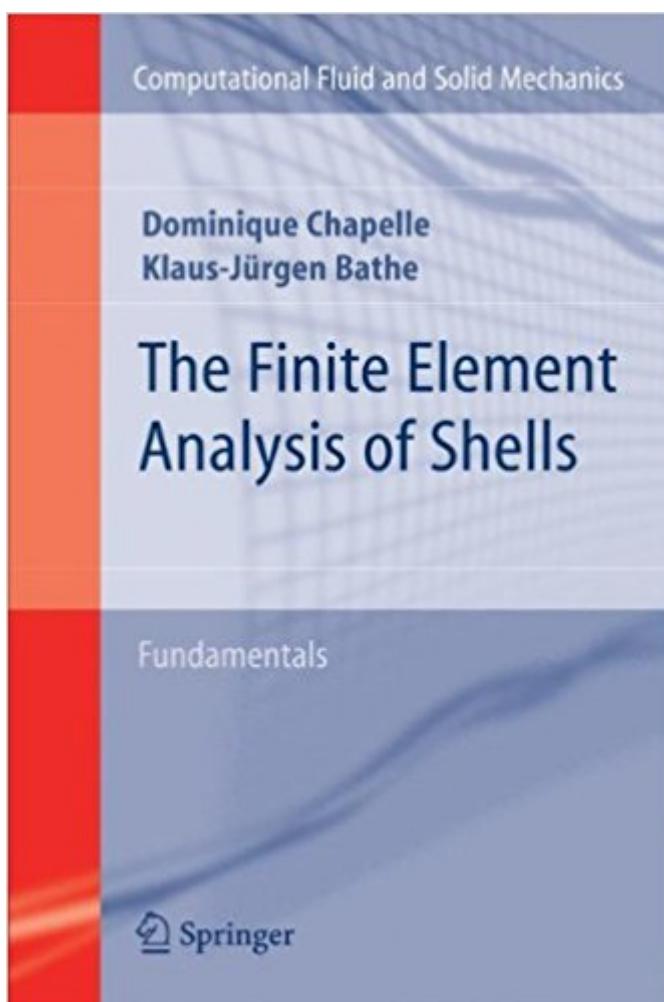The book was found

The Finite Element Analysis Of Shells - Fundamentals (Computational Fluid And Solid Mechanics)

Synopsis

This book presents a modern continuum mechanics and mathematical framework to study shell physical behaviors, and to formulate and evaluate finite element procedures. With a view towards the synergy that results from physical and mathematical understanding, the book focuses on the fundamentals of shell theories, their mathematical bases and finite element discretizations. The complexity of the physical behaviors of shells is analysed, and the difficulties to obtain uniformly optimal finite element procedures are identified and studied. Some modern finite element methods are presented for linear and nonlinear analyses. In this Second Edition the authors give new developments in the field and - to make the book more complete - more explanations throughout the text, an enlarged section on general variational formulations and new sections on 3D-shell models, dynamic analyses, and triangular elements. The analysis of shells represents one of the most challenging fields in all of mechanics, and encompasses various fundamental and generally applicable components. Specifically, the material presented in this book regarding geometric descriptions, tensors and mixed variational formulations is fundamental and widely applicable also in other areas of mechanics.

Book Information

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Customer Reviews

From the reviews of the second edition:Ã¢â ¬Å"This well-written book is a reader-friendly and good-organized monograph in the field of finite element analysis of shell structures. It can be highly

recommended for experts in mechanics of solids, for engineers, and for graduate, postgraduate and doctoral students.Ã¢â ¬Â• (Igor Andrianov, Zentralblatt MATH, Vol. 1211, 2011)

This book presents a modern continuum mechanics and mathematical framework to study shell physical behaviors, and to formulate and evaluate finite element procedures. With a view towards the synergy that results from physical and mathematical understanding, the book focuses on the fundamentals of shell theories, their mathematical bases and finite element discretizations. The complexity of the physical behaviors of shells is analysed, and the difficulties to obtain uniformly optimal finite element procedures are identified and studied. Some modern finite element methods are presented for linear and nonlinear analyses. In this Second Edition the authors give new developments in the field and - to make the book more complete - more explanations throughout the text, an enlarged section on general variational formulations and new sections on 3D-shell models, dynamic analyses, and triangular elements. The analysis of shells represents one of the most challenging fields in all of mechanics, and encompasses various fundamental and generally applicable components. Specifically, the material presented in this book regarding geometric descriptions, tensors and mixed variational formulations is fundamental and widely applicable also in other areas of mechanics.

This is the first (and only) book I have come across which gives a deep and comprehensive analysis of finite element methods for shell structures. The authors take a mathematical approach to the problem, and do a very nice job. Traditionally, finite element procedures for shells have been formulated intuitively hence resulting in mixed success. Mathematical analyses of finite element formulations give a deeper and meaningful insight into the underlying mathematical theory and the reasons why some formulations perform much better than others. This deeper mathematical understanding in turn gives better insight into the physical behaviour of shells as limiting cases are approached (i.e thin shells etc.). Research in finite element analysis, including shells, is very much alive and still has a lot of potential. This book is very valuable for people who want to dig further into mathematical aspects of finite element formulations, and are not just content with "coding" an existing formulation. This is not a "recipe" book, but a book which teaches you how to come up with new, mathematically consistent and meaningful formulations.

The book "The Finite Element Analysis of Shells - Fundamentals" represents a unique contribution to the field. While the literature on finite element analysis of shells is vast, there is not a single work

like this which successfully treats this topic with a broad perspective without sacrificing either physical understanding or mathematical rigor.Undoubtedly, shell mathematical and numerical analyses represent a very difficult and evolving subject, integrating advanced knowledge from engineering and applied mathematics. In this context, this book is an invaluable source to whomever wants do serious work in the fascinating field of shell finite element analysis and modeling.

It is an understatement to call this book excellent! Development of robust and reliable computational techniques for shell analysis continues to be a most challenging task. The level of profundity offered by this book on this traditional topic is truly astounding. Mathematical analysis has been wonderfully intertwined with engineering judgement. The presentation is brief and compact with an emphasis on mathematical rigor.

This book clearly explains shell structure mechanics from a mathematical and practical perspective. As a practicing engineer and finite element user, I found it extremely useful and easy to understand. This is also an invaluable reference for graduate students in applied mechanics. I think it will be a classic reference in that field.

I thinks that this book is a milestone in finite element analysis of shells.This provides valuable insight of shell mechanics and of its finite element formulation.There were countless papers and books on shells but now this is only necessary for shell researchers.

This is an excellent book for anybody interested in the analysis of shells. It uniquely presents the physical and mathematical aspects of shell behavior, and their finite element analysis. I believe this book is a MUST for researchers and practioners.

This is a great book for anybody working deeply in shell analysis. The authors bring mathematical concepts and physicalunderstanding together like no other available book. There is a lot to learn from this book but the time is well spent !

We all know KJ Bathe's books and here is another most valuable contribution. While the text is demanding, the physical and mathematical expositions of shell analysis are clearly unique, and should be of interest to anybody working with shells.

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