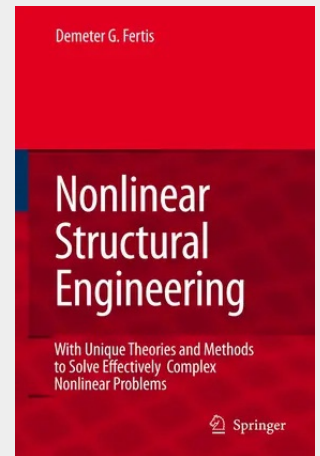


Nonlinear Structural Engineering

With Unique Theories and Methods to Solve Effectively Complex Nonlinear Problems

The practicing design engineer, who deals with the design of structures and structural and mechanical components in general, is often confronted with nonlinear problems and he/she needs to develop a design procedure that deals effectively with such types of problems. Flexible members, structures subjected to blast and earthquake, suspension bridges, aircraft structural elements, and so on, are only a few examples where understanding of their nonlinear behavior is extremely important for an adequate and safe design. Many of our nonlinear structures are composed of beam elements that can be taken apart from the structure, and their behavior can be studied by satisfying appropriate boundary conditions. Once we are in a position to understand completely the behavior of the nonlinear beam problem, we can then expand our knowledge effectively so that it includes a complete understanding of the nonlinear behavior of two-dimensional and three-dimensional structures and structural components. In part, the purpose of this book is to concentrate its efforts on the nonlinear static and dynamic analysis of structural beam components that are widely used in everyday engineering applications. The analysis and design of the beam component can become very complicated when it is subjected to a large deformation, or when its material is permitted to be stressed well beyond its elastic limit and all the way to failure.

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