DESCRIPTION

Plate and Shell Structures: Selected Analytical and Finite Element Solutions

Maria Radwańska, Anna Stankiewicz, Adam Wosatko, Jerzy Pamin

Cracow University of Technology, Poland

Comprehensively covers the fundamental theory and analytical and numerical solutions for different types of plate and shell structures

Plate and Shell Structures: Selected Analytical and Finite Element Solutions not only provides the theoretical formulation of fundamental problems of mechanics of plates and shells, but also several examples of analytical and numerical solutions for different types of shell structures. The book contains advanced aspects related to stability analysis and a brief description of modern finite element formulations for plates and shells, including the discussion of mixed/hybrid models and locking phenomena.
Key features:

• 52 example problems solved and illustrated by more than 200 figures, including 30 plots of finite element simulation results.

• Contents based on many years of research and teaching the mechanics of plates and shells to students of civil engineering and professional engineers.

• Provides the basis of an intermediate-level course on computational mechanics of shell structures.

The book is essential reading for engineering students, university teachers, practitioners and researchers interested in the mechanics of plates and shells, as well as developers testing new simulation software.

 ABOUT THE AUTHOR

Maria Radwańska, recently professor emeritus, worked for over 40 years at the Faculty of Civil Engineering of Cracow University of Technology, first at the Institute of Structural Mechanics, then at the Institute for Computational Civil Engineering. She has done research on statics and stability of elastic and elastic-plastic bars, plates and shells. She was a teacher of structural mechanics, theory of plates and shells, theory of stability and computational methods (including finite element method) at the level of doctoral, graduate and undergraduate studies, as well as at training courses for professional engineers. She is the author or co-author of seven monographs, books and textbooks, and of numerous journal papers. She was a member of the research team of Prof. Zenon Waszczyszyn, who implemented the FE Code ANKA for buckling and nonlinear analysis of structures and wrote in 1994 the Elsevier book on FEM for stability of structures. She received numerous awards from the Minister of Science and Higher Education of Poland.

Anna Stankiewicz, lecturer at the Institute for Computational Civil Engineering, Cracow University of Technology. She has taught computational methods, engineering graphics, computer science, mechanics of materials and structures, and since 2008 succeeded M. Radwańska as lecturer of the theory of plates and shells (both in the courses in Polish and English). She was the coordinator and lecturer in training courses on Shell Structures – modelling and FEM analysis and on Computational Methods in Civil Engineering, organized for professional engineers in years 2010-15 within EU Human Capital Operational Programme. Currently she is also involved in the research on thermoplasticity.

Adam Wosatko, assistant professor at the Institute for Computational Civil Engineering, Cracow University of Technology. He has taught applied mathematics and numerical methods, computational methods, engineering graphics, computer science,
mechanics of materials and structures, and the theory of plates and shells (both in the courses in Polish and English). He was the lecturer in training courses on *Shell Structures – modelling and FEM analysis* and on *Computational Methods in Civil Engineering*, organized for professional engineers in years 2010-14 within EU Human Capital Operational Programme. In 2014-15 post-doc at the Department of Civil and Environmental Engineering of University of Waterloo, Canada. Currently also involved in the research on the mechanics of structures in fire.

**Jerzy Pamin**, professor of Cracow University of Technology (CUT), since 2006 head of the Institute for Computational Civil Engineering. He was Ph.D. student at Faculty of Civil Engineering, Delft University of Technology, the Netherlands, where he obtained a Ph.D. in 1994 on the basis of broadly cited dissertation on *Gradient-Dependent Plasticity in Numerical Simulation of Localization Phenomena*, written under the supervision of R. de Borst. Since then he has been employed at CUT, in 1998-99 post-doc at Koiter Institute Delft, in 2002 Humboldt Fellow at the University of Kaiserslautern, Germany. In 2004 he obtained a D.Sc. degree at CUT for the monograph on *Gradient-enhanced continuum models: formulation, discretization and applications*, for which he won the M.T. Huber award of Division for Technical Sciences of the Polish Academy of Sciences in 2007. His field of expertise is mechanics of generalized continua and FE simulations in mechanics of materials and structures. He has taught mechanics of materials and structures, computational methods and advanced FEM (both in the courses in Polish and English), and coordinated of an undergraduate civil engineering course in English.

For additional product details, please visit [https://www.wiley.com/en-us](https://www.wiley.com/en-us)