

The Finite Element Analysis Of Shells - Fundamentals

[DOWNLOAD HERE](#)

1;Preface - Second Edition;6 2;Preface - First Edition;7 3;Contents;10 4;1. Introduction;13 4.1;1.1 Shells: from Nature to Engineering Designs;13 4.2;1.2 The Finite Element Analysis of Shells as Approached in this Book;16 5;2. Geometrical Preliminaries;20 5.1;2.1 Vectors and Tensors in Three-Dimensional Curvilinear Coordinates;20 5.1.1;2.1.1 Vectors and tensors;20 5.1.2;2.1.2 Covariant and contravariant bases. Metric tensor;22 5.1.3;2.1.3 Curvilinear coordinate systems;28 5.1.4;2.1.4 Covariant differentiation;31 5.2;2.2 The Shell Geometry;34 5.2.1;2.2.1 Geometric definition of a shell;34 5.2.2;2.2.2 Differential geometry on the midsurface;36 5.2.3;2.2.3 3D differential geometry for shells;48 6;3. Elements of Functional and Numerical Analysis;52 6.1;3.1 Sobolev Spaces and Associated Norms;52 6.1.1;3.1.1 General concepts in vector spaces;53 6.1.2;3.1.2 L₂ and other Sobolev spaces;59 6.2;3.2 Variational Formulations and Finite Element Approximations;69 6.2.1;3.2.1 Basic error estimates for displacement-based and mixed formulations;70 6.2.2;3.2.2 Interpolation and a priori error estimates;99 6.2.3;3.2.3 Effect of numerical integration;104 7;4. Shell Mathematical Models;106 7.1;4.1 Shell Kinematics;106 7.2;4.2 Derivation of Shell Models;110 7.2.1;4.2.1 The "basic shell model";111 7.2.2;4.2.2 The "shear-membrane-bending model";114 7.2.3;4.2.3 The "membrane-bending model";115 7.2.4;4.2.4 Plate models;118 7.2.5;4.2.5 Higher-order shell models, and the 3D-shell model;121 7.3;4.3 Mathematical Analysis of the Shell Models;125 7.3.1;4.3.1 Analysis of the s-m-b shell model;125 7.3.2;4.3.2 Analysis of the m-b shell model;134 7.3.3;4.3.3 Analysis of the basic shell model;136 7.3.4;4.3.4 Analysis of the 3D-shell model;141 8;5. Asymptotic Behaviors of Shell Models;146 8.1;5.1 General Asymptotic Analysis;147 8.1.1;5.1.1 Non-inhibited pure bending;154 8.1.2;5.1.2 Inhibited pure bending;157 8.1.3;5.1.3 Summary of asymptotic behaviors;161 8.1.4;5.1.4 Comparison of asymptotic behaviors for specific shell models;163 8.2;5.2 Analysis of the Subspace of Pure Bending Displacements;167 8.2.1;5.2.1 Elliptic surfaces;168 8.2.2;5.2.2 Hyperbolic surfaces;169 8.2.3;5.2.3 Parabolic surfaces;170 8.3;5.3 Influence of the Loading;172 8.3.1;5.3.1 Effect of the loadings that do not activate the pure bending displacements;172 8.3.2;5.3.2 Effect of non-admissible membrane loadings;177 8.4;5.4 Asymptotic Analysis of the 3D-Based Shell Models;190 8.4.1;5.4.1 Asymptotic

analysis of the basic shell model;191 8.4.2;5.4.2 Asymptotic analysis of the 3D-shell model;203 8.5;5.5 Asymptotic Considerations in Dynamic Analysis;219 8.5.1;5.5.1 Non-inhibited pure bending;219 8.5.2;5.5.2 Inhibited pure bending;220 8.5.3;5.5.3 Detailed numerical illustration for a clamped cylinder;221 9;6. Displacement-Based Shell Finite Elements;229 9.1;6.1 Discretizations of Shell Mathematical Models;229 9.2;6.2 Facet-Shell Elements;234 9.3;6.3 General Shell Elements;238 9.4;6.4 3D-Shell Elements;263 10;7. Influence of the Thickness in the Finite Element Approximation;269 10.1;7.1 Numerical Locking in Thin Structures;270 10.2;7.2 Treatments of Numerical Locking by Mixed Formulations;276 10.2.1;7.2.1 Basic principles: the Timoshenko beam example;277 10.2.2;7.2.2 Applications to the Reissner-Mindlin plate model;286 10.2.3;7.2.3 Basic principles of stabilized mixed formulations;301 10.2.4;7.2.4 MITC plate elements;305 10.3;7.3 Specific Difficulties Arising in the Analysis of Shells;314 11;8. Towards the Formulation of Effective General Shell Elements;325 11.1;8.1 Guidelines for Assessing and Improving the Reliability of Shell Finite Elements;325 11.1.1;8.1.1 Considerations on proper selection and use of test problems;325 11.1.2;8.1.2 Proposed set of test problems;333 11.2;8.2 Formulation of MITC Shell Elements;336 11.2.1;8.2.1 Formulation of quadrilateral MITC elements;336 11.2.2;8.2.2 Formulation of triangular MITC elements;3 EAN/ISBN : 9783642164088 Publisher(s): Springer, Berlin Discussed keywords: Finite-Elemente-Methode, Platten, Schale (bautechn.) Format: ePub/PDF Author(s): Chapelle, Dominique - Bathe, Klaus-Jrgen

[DOWNLOAD HERE](#)

Similar manuals:

[Mountain Platteneck In Front Of Mountain Setting Of Karwendelgebirge Bavarian Alps Upper Bavaria Germany](#)

[Eichstaett Eichstaett In The Altmuehltal Altmuehltal Upper Bavaria Germany Children Are Collecting And Searching For Fossils In The Sollnhofner Kalkstein Platten](#)

[Eichstaett Eichstaett In The Altmuehltal Altmuehltal Upper Bavaria Germany Family Collects And Searches For Fossils In The Sollnhofner Kalkstein Platten](#)

[Eichstaett Eichstaett In The Altmuehltal Altmuehltal Upper Bavaria Germany Children Are Collecting And Searching For Fossils In The Sollnhofner Kalkstein Platten](#)

[Eichstaett Eichstaett In The Altmuehltal Altmuehltal Upper Bavaria Germany Family Collects And Searches For Fossils In The Sollnhofner Kalkstein Platten](#)

[Refurbished And Un-refurbished Plattenbau Or Large-panel System Building In Potsdam, Brandenburg, Germany, Europe](#)

[At Laemmerensee Lake, View Of The Peaks Of Mt Atels, Mt Rinderhorn And Mt Plattenhoerner, Bernese Alps, Switzerland, Europe](#)

[Endogene Geomorphologie / Theorie Der Plattentektonik - Thomas Wittmann](#)

[Leiterplatten Erstellen Und BestÃ¼cken \(Unterweisung Elektroniker / -in FÃ¼r GerÃ¤te Und Systeme\) - Andreas Giersberg](#)

['Die Plattenfirma Der Zukunft' - Der Paradigmenwandel Der Musikverwertung Unter Analytischem Einbezug Einer Quo Vadis Perspektive Und Der Anforderunge - Mathias Dauer](#)

[Plattenbau 11er](#)

[SOUND MIXING: Schallplattenkratzen](#)