1. Record Nr. UNINA9910970361203321 Autore Simitses George J. <1932-> Titolo Fundamentals of structural stability // George J. Simitses, Dewey H. Hodges Amsterdam; ; Boston, : Elsevier/Butterworth-Heinemann, c2006 Pubbl/distr/stampa **ISBN** 9786611227661 9781281227669 1281227668 9780080507057 0080507050 Edizione [1st ed.] Descrizione fisica 1 online resource (402 p.) Altri autori (Persone) HodgesDewey H 624.1/71 Disciplina 624.171 Soggetti Structural stability **Buckling (Mechanics)** Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di bibliografia Includes bibliographical references and indexes. Nota di contenuto copyright; Contents; front matter; Preface; body; 1 Introduction and Fundamentals: 1.1 Motivation: 1.2 Stability or Instability of Structures: 1.3 Continuous Deformable Elastic Bodies; 1.4 Brief Historical Sketch; 2 Mechanical Stability Models; 2.1 Model A; A One-Degree-of-Freedom Model; 2.2 Model B; A One-Degree-of-Freedom Model; 2.3 Model C; A Two-Degree-of-Freedom Model; 2.4 Model D; A Snapthrough Model: 2.5 Models of Imperfect Geometries: 2.6 Discussion of the Methods: 3 Elastic Buckling of Columns: 3.1 Special Functions: 3.2 Beam Theory: 3.3 Buckling of Columns 3.4 The Kinetic Approach3.5 Elastically Supported Columns; 3.6 Critical Spring Stiffness; 3.7 Elastica Theory for Beams; 3.8 Buckling of Thin-Walled Beam-Columns; 4 Buckling of Frames; 4.1 Beam-Column Theory; 4.2 Application of Beam-Column Theory to the Buckling of Rotationally Restrained Columns; 4.3 Rectangular Rigid Frames; 4.4 The Simply Supported Portal Frame: 4.5 Alternate Approach: 4.6 Nonlinear

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A.3 Derivatives of the Principle of Virtual Work

## Sommario/riassunto

The ability of a structural assembly to carry loads and forces determines how stable it will be over time. Viewing structural assemblages as comprising columns, beams, arches, rings, and plates, this book will introduce the student to both a classical and advanced understanding of the mechanical behavior of such structural systems under load and how modeling the resulting strains can predict the overall future performance-the stability-of that structure. While covering traditional beam theory, the book is more focused on elastica theory in keeping with modern approaches. This text will be