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| Nota di contenuto | Front Cover; Basic Engineering Plasticity: An Introduction with Engineering and Manufacturing Applications; Copyright Page; Table of Contents; Preface; Acknowledgements; List of Symbols; CHAPTER 1. STRESS ANALYSIS; 1.1 Introduction; 1.2 Cauchy Definition of Stress; 1.3 Three Dimensional Stress Analysis; 1.4 Principal Stresses and Invariants; 1.5 Principal Stresses as Co-ordinates; 1.6 Alternative Stress Definitions; Bibliography; Exercises; CHAPTER 2. STRAIN ANALYSIS; 2.1 Introduction; 2.2 Infinitesimal Strain Tensor; 2.3 Large Strain Definitions; 2.4 Finite Strain Tensors 2.5 Polar Decomposition 2.6 Strain Definitions; References; Exercises; CHAPTER 3. YIELD CRITERIA; 3.1 Introduction; 3.2 Yielding of Ductile Isotropic Materials; 3.3 Experimental Verification; 3.4 Anisotropic Yielding in Polycrystals; 3.5 Choice of Yield Function; References; Exercises; CHAPTER 4. NON-HARDENING PLASTICITY; 4.1 Introduction; 4.2 Classical Theories of Plasticity; 4.3 Application of Classical Theory to Uniform Stress States; 4.4 Application of Classical Theory to Non-Uniform Stress States; 4.5 Hencky versus Prandtl-Reuss; References; Exercises |

CHAPTER 5. ELASTIC-PERFECT PLASTICITY 5.1 Introduction; 5.2 Elastic-Plastic Bending of Beams; 5.3 Elastic-Plastic Torsion; 5.4 Thick-Walled, Pressurised Cylinder with Closed-Ends; 5.5 Open-Ended Cylinder and Thin Disc Under Pressure; 5.6 Rotating Disc; References; Exercises; CHAPTER 6. SLIP LINE FIELDS; 6.1 Introduction; 6.2 Slip Line Field Theory; 6.3 Frictionless Extrusion Through Parallel Dies; 6.4 Frictionless Extrusion Through Inclined Dies; 6.5 Extrusion With Friction Through Parallel Dies; 6.6 Notched Bar in Tension; 6.7 Die Indentation; 6.8 Rough Die Indentation 6.9 Lubricated Die Indentation References; Exercises; CHAPTER 7. LIMIT ANALYSIS; 7.1 Introduction; 7.2 Collapse of Beams; 7.3 Collapse of Structures; 7.4 Die Indentation; 7.5 Extrusion; 7.6 Strip Rolling; 7.7 Transverse Loading of Circular Plates; 7.8 Concluding Remarks; References; Exercises; CHAPTER 8. CRYSTAL PLASTICITY; 8.1 Introduction; 8.2 Resolved Shear Stress and Strain; 8.3 Lattice Slip Systems; 8.4 Hardening; 8.5 Yield Surface; 8.6 Flow Rule; 8.7 Micro- to Macro-Plasticity; 8.8 Subsequent Yield Surface; 8.9 Summary; References; Exercises; CHAPTER 9. THE FLOW CURVE; 9.1 Introduction 9.2 Equivalence in Plasticity 9.3 Uniaxial Tests; 9.4 Torsion Tests; 9.5 Uniaxial and Torsional Equivalence; 9.6 Modified Compression Tests; 9.7 Bulge Test; 9.8 Equations to the Flow Curve; 9.9 Strain and Work Hardening Hypotheses; 9.10 Concluding Remarks; References; Exercises; CHAPTER 10. PLASTICITY WITH HARDENING; 10.1 Introduction; 10.2 Conditions Associated with the Yield Surface; 10.3 Isotropic Hardening; 10.4 Validation of Levy Mises and Drucker Flow Rules; 10.5 Non-Associated Flow Rules; 10.6 Prandtl-Reuss Flow Theory; 10.7 Kinematic Hardening; 10.8 Concluding Remarks; References Exercises

Sommario/riassunto

Plasticity is concerned with understanding the behavior of metals and alloys when loaded beyond the elastic limit, whether as a result of being shaped or as they are employed for load bearing structures. Basic Engineering Plasticity delivers a comprehensive and accessible introduction to the theories of plasticity. It draws upon numerical techniques and theoretical developments to support detailed examples of the application of plasticity theory. This blend of topics and supporting textbook features ensure that this introduction to the science of plasticity will be valuable for a wide
