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Autore	Oller, Sergio
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Note generali	Includes index
Nota di contenuto	Introduction -- Thermodynamic Basis of the Motion Equation -- Introduction -- Kinematics of the Deformable Bodies -- Basic definitions of tensors describing the kinematics of a point in the space -- Strain Measurements -- Mechanical variables relations -- The Objective Derivative -- Velocity -- Stress Measurements -- Thermodynamics Basis -- First Law of Thermodynamics -- Second Law of Thermodynamics -- Lagrangian local form of Mechanical Dissipation -- Internal Variables -- Dynamic Equilibrium Equation for a Discrete Solid -- Different types of Nonlinear Dynamic Problems -- Materials. Nonlinearity -- Solution of the Motion Equation -- Introduction -- Explicit-implicit solution -- Implicit solution -- Equilibrium at time $(t + t)$ -- Equilibrium solution in time --implicit methods -- Newmarks procedure -- Houbolts procedure -- Solution of the nonlinear-equilibrium equations system -- Newton-Raphson Method -- Modified Newton-Raphson Method -- Convergence accelerators -- Aitken accelerator or extrapolation algorithm -- B.F.G.S Algorithms -- Secant-Newton algorithms -- "Line-Search"algorithms -- Solution control algorithms -- "Arc-Length" -- Ecuación de control de desplazamiento -- Superficie esférica -- Convergence Analysis of the dynamic solution -- Introduction -- Reduction to the linear elastic problem -- Solution of second-order linear symmetric systems -- The dynamic equilibrium

equation and its convergence-consistency and stability -- Solution stability of second-order linear symmetric systems -- Stability analysis procedure -- Determination of A and L for "Newmark" -- Determination of A and L for central differences- Newmarks explicit form -- Solution stability of second-order non-linear symmetric systems -- Stability of the linearized equation -- Energy conservation algorithms -- APPENDIX - 1 -- APPENDIX - 2 -- Time-independent models -- Introduction -- Elastic behavior -- Invariant of the tensors -- Non-linear Elasticity -- Introduction -- Non-linear hyper-elastic model -- Stress based hyper-elastic model -- Stability Postulates -- Plasticity in small deformations -- Introduction -- Discontinuity behavior or plastic yield criterion -- Elasto-Plastic behavior -- Levy-Mises theory -- Prandtl-Reus theory -- The classic plasticity theory -- Plastic unit or Specific work -- Plastic loading surface. Plastic hardening variable -- Isotropic hardening -- Kinematic hardening -- Stress-Strain relation. Plastic consistency and Tangent rigidity -- Druckers stability postulate and maximum plastic dissipation -- Stability condition -- Local stability -- Global stability -- Condition of Unicity of Solution -- Kuhn-Tucker. Loading-unloading condition -- Yield or plastic discontinuity classic criteria -- Rankine criterion of maximum tension stress -- Tresca criterion of maximum shear stress -- Von Mises criterion of octahedral shear stress -- Mohr-Coulomb criterion of octahedral shear stress -- Drucker-Prager criterion -- Geomaterials plasticity -- Basis of the plastic-damage model -- Mechanical behavior required for the constitutive model formulation -- Some characteristics of the plastic damage model -- Main variables of the plastic-damage model -- Definition of the plastic damage variable -- Definition of the law of evolution of cohesion $c - p$ -- Definition of the variable internal friction angle -- Variable definition , dilatancy angle -- Generalization of the damage model with stiffness degradation -- Introduction -- Elasto-plastic constitutive equation with stiffness degradation -- Tangent constitutive equation for stiffness degradation processes -- Particular yield functions -- Mohr-Coulomb modified function -- Drucker-Prager Modified function -- Isotropic Continuous Damage -- Introduction -- Isotropic damage model -- Helmholtzs free energy and constitutive equation -- Damage threshold criterion -- Evolution law of the internal damage variable -- Constitutive tensor of tangent damage -- Particularization of the damage criterion -- General Softening -- Exponential softening -- Linear softening -- Particularization of the stress threshold function -- Simo -Ju. Model -- Setting of A parameter for Simo-Ju. Model -- Lemaitre and Mazars Model -- General model for different damage surfaces -- Setting of A parameter -- Time-dependent Models -- Introduction -- Constitutive equations based on spring-damping analogies -- Kelvin simplified model -- Maxwell simplified model -- Kelvin generalized model -- Kelvin multiple generalized model -- Maxwell generalized model -- Maxwell multiple generalized model -- Dissipation Evaluation -- Multiaxial generalization of the viscoelastic constitutive laws -- Multiaxial form of viscoelastic models -- Numerical solution of the integral and algorithms -- Kelvin model in dynamic problems -- Kelvin model dissipation -- Equation of the dynamic equilibrium for Kelvin model -- Stress considerations. Rayleigh vs. Kelvin model -- Dissipation considerations. Rayleigh vs. Kelvin model -- Cantilever beam -- Frame with rigid beam and lumped mass -- Viscoplasticity -- Limit states of viscoplasticity -- Over stress function -- Integration algorithm for the viscoplastic constitutive equation -- Particular case of the Duvaut-Lyon model a Von Mises viscoplastic material.
