PLASTICITY AND DAMAGE MECHANICS

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Class: Fridays 15:00-18:00
Office Hours:

Textbook:
J. Lubliner, 2008. Plasticity Theory. Dover Macmillan Publishing Company, New York (1990), Pearson Education, Inc.
Recommended Reading:
P. Chadwick, 1999. Continuum Mechanics. Concise Theory and Problems. 2nd edition, Dover Publications. Mineola, New York
A UNIFORM APPROACH TO ELASTO-PLASTIC ANALYSIS OF ROTARY DEFORMATION BASED ON THE USE OF HYPERELASTIC CONSTITUENT EQUATIONS by J.C. SIMO. M. ORTIZ
Jean Lemaitre A Lesson in Mechanical Damage

CONTENTS

Topics:
Reminders from Continuum Mechanics
Principle of possible projects
Conservation of energy
Rates of change of strains and stresses
Constitutive theories
Thermoelasticity
Incompressibility
Yield condition/ Flow law/ yield surface consequence
Thermomechanical state/ internal parameters/ free energy density

Tangential stiffness
Plastic diffusion/ 2nd Thermodynamic law
Small elastoplastic deformations
Uniqueness of solution
Thermodynamics of microfracturing
Constitutive laws of microfracturing
Internal parameters of microcracking