

Elements of Nonlinear Elasticity

Professor

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Institution

University of Pisa

General Information

The course will provide basic elements of nonlinear theory of elasticity. The theoretical part is accompanied by selected examples in which explicit calculations are possible.

It is highly recommended to have attended in advance the following courses: Introduction to Tensor Calculus (C. Padovani), Solid Mechanics (M. Lucchesi) and Mathematical theory of elasticity (R. Paroni)

The course will be held in presence in Aula Piero Villaggio, former Department of Structural Engineering, University of Pisa.

Materials

Selected readings will be suggested during the course

Schedule

Dates	Description
09/04/2025 17:00-19:00	Introduction to the general theory of elasticity
14/04/2025 14:00-17:00	Homogeneous deformations on a prismatic solid. Material Indifference Principle. Isotropic nonlinear elasticity. Rivlin-Ericksen representation Theorem
15/04/2025 8:00-10:00	Materials with internal constraints. Traction of an incompressible bar.
16/04/2025 10:00-12:00	Inflation of a hollow sphere.
17/04/2025 9:00-12:00	Variational hyperelasticity
22/04/2025 15:00-18:00	Existence results for convex, quasi-convex and poly-convex energies (Part 1)
23/04/2025 10:00-13:00	Existence results for convex, quasi-convex and poly-convex energies (Part 2)
Total 18 Hours - 3 Credits	

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