

**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Curriculum in Structural and Geotechnical Engineering, Mechanics and Materials
a.a. 2021/2022 (XXXVII ciclo)**

(course is open for participation of students from other PhD cycles or programs)

1. Title

Lattice-type Models in Mechanics and Applied sciences.

2. Course Description

Introduction to molecular theories of Elasticity. Concept of local and non-local interaction. Central and non-central interactions. Cauchy relations, Voigt model. Lattice-type models and spring network representation of continua. Lattice spring and lattice beam networks. Kirkwood model. Elastic constants, energy equivalence. Peridynamic theory. Pairwise and multibody potentials in Peridynamics. Bond-based and state-based models. Micropolar formulation. Fracture and non-local effects. Influence functions and discretization. Anisotropic materials. Models for Heat transfer, electrical conduction and general diffusion problems.

3. Course Organization

The course consists of 15 hours of lectures. The contents are developed directly by the teacher and the slides of the course are available for the students.

4. Teacher

Vito Diana

5. Duration and credits

The course is developed in two or three weeks in according with the students. The number of credits is 3.

6. Activation mode and teaching period

The course is given in the period January-February.
Application: email message to the teacher (vito.diana@unige.it)

7. Deadline for registration

One week before the beginning of the Course.

8. Final exam

Final oral exam at the end of the course