**Course offered for the PhD program
in Civil, Chemical and Environmental Engineering
Curriculum in Structural and Geotechnical Engineering, Mechanics and Materials
a.a. 2023/2024 (XXXVII ciclo)**

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

1. Title
Lattice-type Models in Solid Mechanics

2. Course Description
Molecular models for Elasticity. Local and non-local interactions. Mechanistic vs Phenomenological description, Central and non-central interactions.. Pairwise interactions and Lagrangian description. Cauchy relations, Voigt model. Born model and rotational invariance. Identification of equivalent local and non-local continua. Micro-macro moduli correspondence scheme.
Continuum-molecular models, Peridynamic theory. Bond-based and state-based models. Micropolar formulation. Anisotropy, influence functions and meshfree discretization. Correspondence models for elasticity and diffusion-type problems. Modeling of damage and fracture.

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 accordance 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 month before the beginning of the Course.

8. Final exam
Final oral exam at the end of the course