

International Doctorate in Civil and Environmental Engineering

DOCTORAL COURSE – A.Y. 2020/21

Variational Methods in Mechanics: a Primer

Teacher: Prof. Dr. Paolo Maria MARIANO

University of Florence

Email: paolomaria.mariano@unifi.it

Calendar	
Wednesday 20/01/2021, h. 17.00-19.00, Webex	Wednesday 17/02/2021, h. 17.00-19.00, Webex
Wednesday 27/01/2021, h. 17.00-19.00, Webex	Wednesday 24/02/2021, h. 17.00-19.00, Webex
Wednesday 03/02/2021, h. 17.00-19.00, Webex	Friday 26/02/2021, h. 17.00-19.00, Webex
Wednesday 10/02/2021, h. 17.00-19.00, Webex	Thursday 04/03/2021, h. 17.00-19.00, Webex
Total	hours 16 (2 hours can be added); 8 credits

Program
<p>Syllabus</p> <ol style="list-style-type: none">1. Calculus of variations in mechanics: why and how2. Necessary functional elements3. Minimizers: conditions assuring existence (and their pertinence to finite strain elasticity)4. Constraints (and their role in plasticity)5. Symmetry: the Nöther theorem and its non-conservative extension <p>Aim and scope:</p> <p>The course discusses the role of variational views in mechanics of continua. It provides an elementary introduction to direct methods in calculus of variations. We discuss notions of compactness, coercivity and lower semicontinuity, connected with the concept of weak solutions that play a role in computational techniques. The course has basic character.</p>