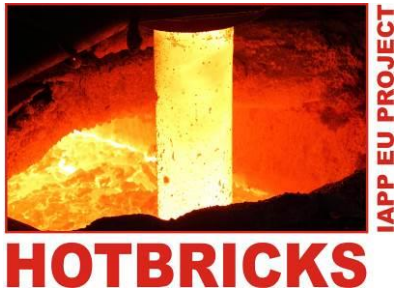




UNIVERSITÀ DEGLI STUDI  
DI TRENTO

Dipartimento di Ingegneria Civile,  
Ambientale e Meccanica



Mechanics of refractory  
materials at high-temperature  
for advanced industrial  
technologies  
[hotbricks.unitn.it](http://hotbricks.unitn.it)



## COURSE ANNOUNCEMENT

### Experimental characterization of materials

**Prof. Matteo Leoni**

*Associate Professor at University of Trento, Italy*

**Dr. Sébastien Gregoire**

*Material Modelling & Characterization Engineer at Vesuvius, Belgium*

October 27, 2014 -Monday-			October 28, 2014 -Tuesday-			October 29, 2014 -Wednesday-			October 30, 2014 -Thursday-		
11:00-13:00	Leoni	Q2	9:00-11:00	Leoni	Q2	9:00-11:00	Gregoire	Q2	9:00-11:00	Gregoire	C2
14:00-16:00	Leoni	Q2	11:00-13:00	Leoni	Q2	11:00-13:00	Gregoire	Q2	11:00-13:00	Gregoire	C2

**Prof. Leoni:** The problem of measuring macrostress, residual stress and phase composition non-destructively on a specimen will be addressed. This approach allows the same quantities to be evaluated independently of the sample environment (including temperature and atmosphere). The course will be divided into:

- Brief introduction to concepts of strain and residual strain/stress and how they can be generated.
- Traditional techniques for the measurement of residual stresses and possible limits for high-temperature materials.
- X-ray diffraction: introduction and list of applications
- Measurements of macro and residual stresses with diffraction (X-rays, synchrotron, neutrons)
- Quantitative phase analysis with X-ray diffraction

**Dr. Gregoire:** Experimental characterization of the refractory ceramics. A yield function characterizing the refractory ceramic mechanical behavior is developed. The mechanical tests done on refractory ceramics to determine that yield function are detailed. The yield function implementation in Abaqus and its validation through a comparison between experimental full scale tests and the results coming from the equivalent numerical model are discussed.