

## Course unit : THE CRITICAL ZONE (56h – 6 ECTS – elective)

### Content

Role of biota in clay genesis  
Microorganism/clay interactions  
Plant/clay interactions  
Oxydo-reduction and lamellar structures  
Metal speciation and dynamic of pollutants  
Field investigations

### Learning outcomes

The objective of this course unit is to provide the students with an actualised background in  
i) clay-microorganism-organic matter interaction processes in soils and their implications on soil structure, yield, fertility...  
ii) metals speciation, processes, bio accessibility and bioavailability.

### Horary

Lecture : 14h  
Supervised works : 23h  
Practical works : 19h  
Additional seminars

### Evaluation

Final examination : 50% of the mark.  
Laboratory report : 50% of the mark.

### Teaching staff

Laurent Caner (University of Poitiers)  
Guillaume Morin (CNRS, Paris)  
Claire Chenu (Agro Paris Tech)  
Marie Pierre Turpault (INRA)  
Fabienne Trolard (INRA)