Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLUkurs

Syllabus

PNS0134 Minerals in soils and sediments and their X-ray identification and quantification, 5.0 credits

Syllabus approved

2015-11-16

Subjects

Soil Science

Education cycle

Third cycle

Grading scale

Pass / Failed
The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

The course is open to any interested PhD student but members of the "Focus on Soils and Water" PhD school will be prioritized in case of overbooking. PhD students should have basic knowledge in an earth science or chemistry.

Objective, including learning outcomes

After the course, the PhD student should be familiar with the main groups of minerals most commonly encountered in soils and sediments and have a basic knowledge of their structures properties, occurrence and origins. They will understand how minerals are defined and classified. Students will also understand basic diffraction theory and gain a practical knowledge of how to identify minerals by X-ray diffraction methods, particularly how these methods and ancillary techniques are applied to clay mineral identification. They will also have a basic understanding of the principles and methods of using X-ray powder diffraction to quantify minerals.

Content

The course will cover the basic concepts necessary to understand what minerals are and how they are classified according to their crystal structures and compositions. It will explain how these features affect mineral properties, and in turn how such properties may influence the properties of soils and sediments. Emphasis will be placed on mineral groups that are of the most common occurrence in soils and sediments. The structure and properties of different clay minerals will be covered in detail along with the classification of clay minerals. The origins of minerals in soils and sediments will be explained in terms of the concepts of neoformation, transformation and inheritance. X-ray methods and identification of minerals, particularly clay minerals, will be covered in some detail including practical exercises. Students will also learn the basics of how to quantify minerals in soils and sediments by the application of X-ray powder diffraction methods.

Requirements for examination

Active participation in all seminars and exercises including group work and presentation of group work.

Additional information

The language is English. Exercises and lectures are held during one intensive week at SLU in April 2016. Participants work with individual project assignments after the scheduled week . The course is given by the research school Focus on Soils and Water. Responsible department: Soil and Environment

Responsible department

Department of Soil and Environment