Swedish University of Agricultural Sciences

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

Syllabus

Valid from: VT2016

Level within study regulation:

Third cycle

Subject:

- Soil Science

Grading scale:

Pass / Failed

Course language:

Swedish

Entry requirements:

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.

Objectives:

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.

Modes of assessment:

Active participation in all seminars and exercises including group work and presentation of group work. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may also issue an adapted examination or provide an alternative way for the students to take the exam.

- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.

- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

Organisation:

Department of Soil and Environment

Supplementary information

Other information:

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.