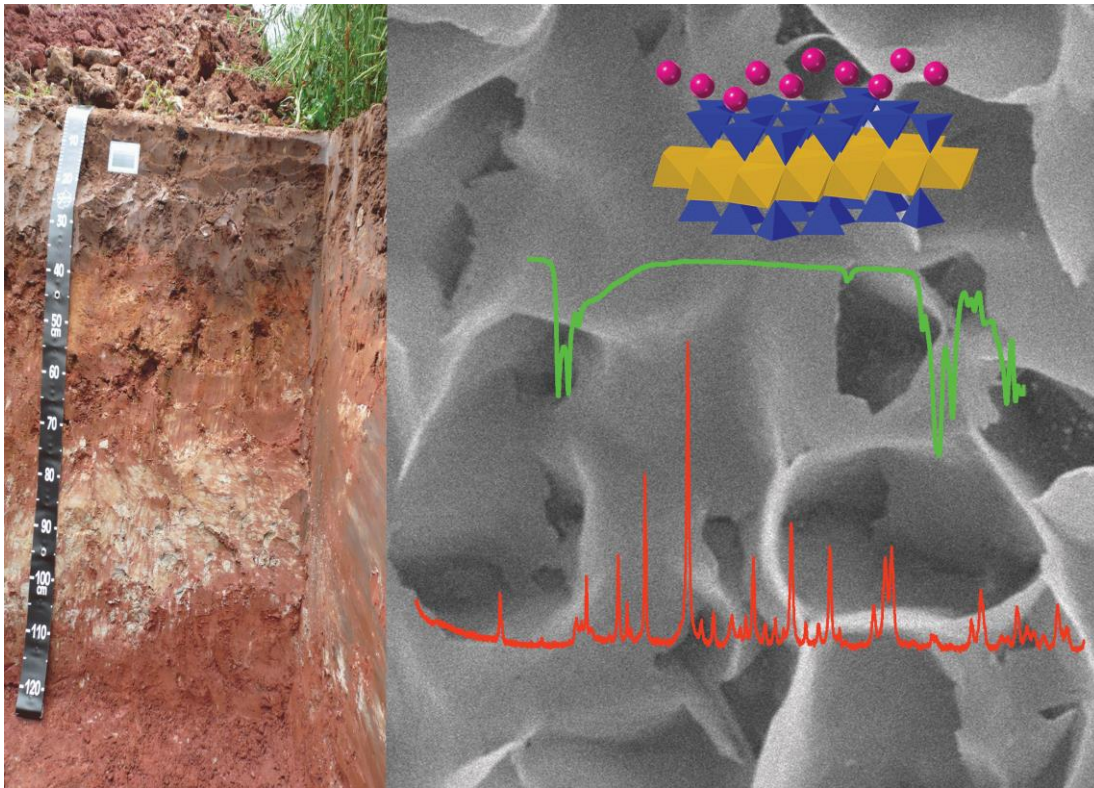


## Minerals in soils and sediments and their X-ray identification and quantification, 5.0 credits



In 2021, the Department of Soil and Environment, SLU, will give a graduate course, "Minerals in soils and sediments and their X-ray identification and quantification", 5.0 credits, originally planned for 2020 but postponed due to the Corona situation. The course consists of lectures and exercises led by **Stephen Hillier** from The James Hutton Institute in Aberdeen, Scotland. Steve is a highly qualified scientist in mineralogy in sediments and has held a guest professorship at our department at SLU. With his team at James Hutton he has won first (2008, 2018) and second (2006, 2012, 2014) place in The Reynolds Cup competition in quantitative mineralogy (see <http://www.clays.org/Reynolds.html> ).

### Contents

- Introduction to minerals in soils and sediments
- Lectures on mineral groups, clay minerals, mineral characterization techniques etc.
- Hands-on exercises in X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR)
- Applications of mineralogy in soils and sediments
- Literature assignments handed in after the scheduled part of the course

### Course set-up

- On-line lectures and exercises during May 2021 (see schedule on the last page of this flyer)
- Practical "hands-on" exercises on SLU-Campus, Uppsala, Sweden, 13-14 October 2021
- Literature assignments handed in no later than 31 October 2021

Please note that the “hands-on” exercises may be converted to on-line activities if the Corona restrictions continue during autumn 2021.

### **Prerequisites and access**

The course is open to any interested PhD student with basic knowledge in an earth science or chemistry. The course is given in English. A maximum of 20 participants will be accepted; members of the SLU PhD school "Focus on Soils and Water" will be prioritized in case of overbooking.

### **Application**

Potential participants should send an e-mail to [jon-petter.gustafsson@slu.se](mailto:jon-petter.gustafsson@slu.se) no later than 2021-04-01. In the subject line, please give the course code PNS0134, and in the text body, include the following details: your name, affiliation, and the title of your PhD project!

### **Webpage**

The webpage for this year's course is not yet activated, but you can find the course syllabus here:

<https://www.slu.se/en/education/programmes-courses/courses/?sprak=en&anmkod=P0066.1920>.

During the course, the Canvas platform will be used for messages, distribution of course literature etc.

### **Questions**

For contact and addition information, contact:

- Jon Petter Gustafsson at the Department of Soil and Environment:  
[jon-petter.gustafsson@slu.se](mailto:jon-petter.gustafsson@slu.se) , for practical questions.
- Stephen Hillier at the James Hutton Institute:  
[Stephen.Hillier@hutton.ac.uk](mailto:Stephen.Hillier@hutton.ac.uk) for questions on topics, literature etc.

**Schedule for course PNS0134, “Minerals in soils and sediments and their X-ray identification and quantification”**

<b>Time</b>	<b>Event</b>	<b>Teacher</b>	<b>Room</b>
<i>Monday 17 May</i>			
14.15-15	Introduction	SH, JPG, VK, MS	Zoom
15.15-17	<i>Lecture: Minerals – what are they?</i>	SH	Zoom
<i>Wednesday 19 May</i>			
14.15-16	<i>Lecture: Soil and sediment mineralogy</i>	SH	Zoom
<i>Thursday 20 May</i>			
14.15-17	<i>Lecture: Minerals groups and occurrences</i>	SH	Zoom
<i>Monday 24 May</i>			
14.15-17	<i>Lecture: Clay Minerals</i>	SH	Zoom
<i>Wednesday 26 May</i>			
13.15-17	<i>Lecture/exercise: X-ray diffraction: theory and PC-based exercise</i>	SH	Zoom
<i>Thursday 27 May</i>			
14.15-17	<i>Lecture/exercise: X-ray diffraction: theory and PC-based exercise - continued</i>	SH	Zoom
<i>Monday 31 June</i>			
14.15-17	<i>Lecture: Other mineral characterization techniques and recap</i>	SH	Zoom
<i>Wednesday 2 June</i>			
14.15-17	<i>Lecture/Discussion : Practical applications/assignments</i>	SH	Zoom
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<i>Wednesday 13 October*</i>			<u>SLU campus</u>
9.15-12	<i>Lecture/Exercise: Recap/Mineral examination</i>	SH, MS	<i>To be decided</i>
13.15-16	<i>Exercise: XRD PC-based exercise</i>	SH	<i>To be decided</i>
<i>Thursday 14 October*</i>			
9.15-12	<i>Exercise: XRD, SEM, FTIR – hands-on</i>	SH, VK, GS	Biocenter labs
13.15-17	<i>Exercise: XRD, SEM, FTIR – hands-on</i>	SH, VK, GS	Biocenter labs

*\*If the Corona situation continues to be a problem during autumn 2021, please be aware that these activities could be converted to on-line exercises*

*Teachers: SH = Stephen Hillier, MS = Magnus Simonsson, VK = Vadim Kessler, GS = Gulaim Seisenbaeva, JPG = Jon Petter Gustafsson*