

3-årig emneevaluering: GEOV241

Emne: Microscopy

Semester og år for gjennomført emneevaluering: H21

Navn på emneansvarlig(e): Andreas Beinlich

Innhold:

1. **Beskriv og begrunn pedagogiske valg i emnet, reflekter over studentens læring som følge av disse valgene.**

The course was taught 6 hours per week with the main purpose to teach skills in optical microscopy. Some background and theoretical knowledge are required to be successful in the practical part. This background and theoretical knowledge were taught as front-lectures in the first month, after which the course transitioned into a practical-style interactive activity. In this second part, students were given thin sections that were discussed among the students and together with the instructor in class. In the beginning, this practical part was focused on familiarizing the students with the microscope and microscopy techniques. Subsequently, the course focused on recognizing and describing minerals in thin section. In addition, I implemented a small case study about mid-way. In this case study, the students were assigned to three groups and each group was given an unknown thin section for them to conduct a guided research project. This project consisted of three parts, optical microscopy, Raman spectroscopy, and Scanning Electron Microscopy (SEM). For the Raman and SEM parts, I provided focus-oriented lectures to familiarize the students with the basic principles and practical aspects. Subsequently, each group had a 4-hour 'hands-on' practical session with the Raman spectrometer and the SEM. I presented to the students also strengths, weaknesses, and limitations of each of the methods, trained them in instrument calibration, made them aware of potential pitfalls, and discussed data interpretation and presentation. This group work activity has the following purposes:

- engage the students more strongly by working in smaller individual groups and with 'their own' research samples
- foster collaboration and teamwork among the students
- familiarize the students with modern quantitative analytical techniques
- provide the students with self-developed and structured template for solid sample characterization for their MSc research project

Grading was based on three assignments:

- a mid-term multiple choice online quiz that focused on knowledge acquired during the theoretical part in the beginning of the course
- a written final mineral determination quiz for which the students were given two unknown thin sections
- a written report about the case study. This report was expected to be developed in collaboration between group members and was to be based on a journal template from the American Geophysical Union (AGU) that I purpose-modified for the course. The students were expected to not only summarize and illustrate their observations but also to reflect on the complementarity of the employed analytical methods.

Emneevalueringer skal også minst omfatte:

2. Oppfølging av tidligere evalueringer

This course has not been previously evaluated.

3. Studentevaluering og andre evalueringer som er relevante for emnet

Students evaluated the course with A (13%), B (50%), C (38%).

4. Erfaringer fra andre som bidrar i undervisningen på emnet, både studenter og ansatte

Does not apply

5. Strykprosenten på emnet

H21: 0%

6. Eventuell fagfelleevaluering

Does not apply

7. Vurdering av samsvar mellom emnets læringsutbyttebeskrivelse og undervisnings-, lærings- og vurderingsformer

The learning outcomes of this course are defined as knowledge of methods necessary for the identification of rock-forming minerals in thin sections of ways how to interpret some of the most common textures in magmatic, metamorphic, and sedimentary rocks. These have been clearly achieved since the students successfully completed the final quiz of mineral determination in unknown thin sections.

8. Vurdering av om framdrift og opplegg for emnet er i samsvar med de fastsatte målene for emne og program

The objectives of the course are recognition of rock-forming minerals in magmatic, metamorphic, and sedimentary rocks by means of plane- and cross-polarized light optical microscopy, interpretation of textural relationships among minerals in magmatic, metamorphic and sedimentary rocks, and to familiarize with electron microscopy. Through the chosen format, i.e., theoretical teaching in the beginning followed by abundant practical session, and in combination to the outlined case study, all objectives were met.

9. I de tilfellene det er tilknyttet praksis eller arbeidsrelevans i emnet, skal det evalueres om ordningen fungerer tilfredsstillende.

Does not apply