

3-årig emneevaluering: GEOV265

Emne: Pure and Applied Geophysics

Semester og år for gjennomført emneevaluering: (Vår) 2022-2024

Navn på emneansvarlig(e): Henk Keers

Innhold:

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

GEOV265 is a relatively new course. It was first taught in 2021 and therefore has been taught now for 4 years. It is the 4th mandatory course for bachelor students in geophysics. Its overall aims are to further increase knowledge of geophysics and develop scientific skills that a bachelor in geophysics should have and that are used in the master studies.

This is done by: 1. to introduce some important geophysical/numerical techniques (both the theory as well as the numerical implementation), 2. to give an overview of 'Earth systems' on a global scale and how this influences local and regional phenomena, 3. to have students read papers on relevant topics in geophysics, 4. to do a literature project on a topic of interest.

The geophysical/numerical techniques introduced vary a bit from year to year, but mostly include 2D/3D numerical interpolation, ray tracing and an introduction to seismic tomography. The numerical methods are explained and discussed in class and Matlab programming exercises are given to increase and assess the acquired skills.

The global Earth system approach emphasizes the importance of structure and dynamics of the inner core, outer core, lower mantle, upper mantle and crust as well as the main boundaries (ICB, CMB, 660, 410 and Moho). Introductory papers on these topics are read and discussed. Moreover, the reading comprehension as well as writing skills are practiced and assessed.

The last part of the course involves a literature project on a topic that the students choose themselves. The assessment is done using a report and oral presentation (and this includes a preliminary written summary and short presentation halfway the project). Extensive feedback and guidance on the project is given throughout the project's duration. This is needed as for most of the students this is the first time they do a literature project. It is also emphasized that all skills used in this project will be useful in their master thesis research, as well as for many jobs they will have after they finish their bachelor and/or master studies.

The topics for the literature project vary significantly and include: seismic exploration, earthquake seismology, dynamics of volcanoes and magma chambers, large scale structure and dynamics of the mantle or core, landslides, monitoring of CO₂ storage, ocean floor exploration etc.

The skills and knowledge taught in the course are key for their further studies as well as employment in the industry. It is therefore believed that the course in its current form is very fitting. It would perhaps be good if there would be a follow-up course, that included more extensive explanations of tomography and/or imaging as well as a research, rather than literature, project.

2. Oppfølging av tidligere evalueringer

In 2024, for the first time, all students were bachelor students. In other words, there were no master and PhD students taking the course. This made the teaching a bit easier as the level of the students was quite similar. In contrast to previous years, the scientific papers were a bit lower level and more time was spent on reading the papers. The amount of time that the students spend on the course should be the same as for other courses (i.e. about 6-8 hours a week on top of the normal teaching hours). It is felt, that given the extensive explanations of the methods, discussions of the papers and feedback it should be possible to do very well in the course with this workload.

3. Studentevaluering og andre evalueringer som er relevante for emnet

The students generally are very positive and typically give the course a high grade (mostly A or B, sometimes a C). The students like the variety of topics, the programming, the projects as well as the active learning techniques. The main drawback is that the course is considered difficult and time consuming. It is emphasized in the course that all topics and skills are taught.

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

No other person is involved in teaching the course. The assessment of the project (both report and presentation) is done together with an external sensor, who is familiar with the geophysics bachelor and master program, and this collaboration goes well.

5. Strykprosenten på emnet

No students failed the course.

6. Eventuell fagfelleevaluering

Not applicable.

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

The final grade of the course is based on exercises (30%), quizzes (30%), oral presentation (20%) and written report (20%). The exercises are mainly Matlab exercises corresponding to the techniques mentioned above, the quizzes examine scientific writing and reading skills. Both of these forms of assessment include extensive formative feedback (i.e. feedback given during the course). The literature project is assessed using an oral presentation as well as written report at the end of the semester. The report is handed in before the presentation and grading of both includes extensive summative feedback. There is one-one alignment between the course description, the teaching methods and the assessment methods (see also point 1 above).

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

The course is the final mandatory course and a useful starting point for higher level courses as well as the master program.

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

Not applicable.