**GEOV219 Computational Methods in Solid Earth Physics** N.B.: this is a proposal

**Mål og innhold**

*Mål:*

Computer programming is a core skill for geophysicists working in the industry and academia. The overall goal of this course is to provide the students with a good understanding of computational geophysics and why this topic is important in geophysics. A first subgoal of this course then is to provide the students with an intermediate level of understanding and programming kills in computational geophysics. A second subgoal of this course is for the students to learn how to do a literature study or a small research project on a topic in computational geophysics.

*Innhald:*

In this course the students will learn a number of tools from numerical mathematics, including interpolation, differentiation, integration, signal processing and solving simple ordinary/partial differential equations and write computer programs (in Matlab) that apply these methods on topics in geophysics. These topics include seismic exploration, earthquake seismology and gravity. The student will then do a literature or research project on a specific topic in computational geophysics, write a brief paper on this topic, with special emphasis on the numerical and programming aspects, and finally will give a presentation on this project.

**Læringsutbytte**

Kunnskaper

Studenten

* Understands various issues related to computer programming (including computer programming style and debugging)
* Has a good basic understanding of fundamental concepts in numerical methods (such as interpolation/differentiation/integration in 1D/2D/3D, signal processing and solving differential equations)
* Can discuss and apply these numerical methods to specific problems in computational geophysics (as found, for example in seismic exploration, earthquake seismology and gravity).
* Knows how to conduct a literature study on a topic on computational geophysics and/or a small research project
* Can use tools from the library as well as online tools for this project in computational geophysics

Ferdigheter

Studenten

* Can **write** computer programs in Matlab to illustrate and solve scientific problems in geophysics
* Can explain why computational geophysics is important in industry and academia
* Can write a short scientific paper on a topic of relevance in computational geophysics
* Can give a presentation on this topic in computational geophysics to peers and experts

Generell kompetanse

Studenten

* Can write computer programs of relevance in geophysics
* Has knowledge of the importance of computational geophysics in industry and academia
* Can do an independent literature study and/or research project in the area of computational geophysics
* Is able to participate in a discussion on a research topic in computational geophysics

**Obligatorisk undervisningsaktivitet/ obligatoriske arbeidskrav:**

Mandatory active participation in all classes; all exercises have to be handed in all exercises have to have the minimum grade of an E.

**Vurderingsform:** mappevurdering, exercises (30%), paper (40%), presentation (30%), A-F