GISN22, GIS: GIS and Climate Change, 7.5 credits

GIS: GIS och klimatförändringar, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2013-03-21 to be valid from 2013-03-22, autumn semester 2013.

General Information

The course is an elective course for second-cycle studies for a Degree of Master of Science (120 credits) in geographic information science.

Language of instruction: English

Main field of studies	Depth of study relative to the degree requirements
Geographical Information Science	A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to give advanced theoretical and practical knowledge within spatial analysis and geographic information processing with special focus on how these can be used for studies and analysis of climate changes and its consequences. The course also intends to provide relevant knowledge about mechanisms and reasons for climate change and how different climate models are used to describe this.

Knowledge and understanding

On completion of the course, the student should be able to:

- describe the climate and causes of climate changes
- describe the principles of climate models and how these function
- account for consequences of climate changes in global and regional perspectives,
- account for ongoing actions to decrease climate changes global,
- account for regional and local consequences of climate changes

- develop and discuss how GIS can be used to study consequences
- analyse data requirements and data quality for climate change consequence analyses using GIS.

Skills and ability

On completion of the course, the student should be able to:

- collect knowledge in the area in a more or less self-governing or independent way
- use simple climate models with corrected geographic data
- plan and carry out analyses of consequences at the detailed and regional level with relevant geographic data,
- critically review results of different analyses and with these as starting point suggest appropriate measures to decrease negative consequences
- present results of analyses in writing and as maps for different audiences.

Judgement and approach

On completion of the course, the student should be able to:

- compile, evaluate and discuss choice of analytical method to solve a given problem
- review and discuss the reliability of analyses critically
- describe and evaluate the use of GIS for climate change consequence analysis in the society.

Course content

The course aim is to highlight how climate changes will influence the society from many different perspectives. The course gives a broad background to further work with climate changes and to consider climate changes in different type of work with a focus on community planning and development. The contents of the course can be divided into different parts:

Basic climatology:

Under this section, knowledge of the climate system of the Earth and its components are treated, for example connections between biosphere, atmosphere and land use, and the large-scale cycles of energy, carbon, water and nutrients.

Modelling of climate change:

Principles of the most common climate models, problems with reliability and validation of models and results. Problems with scale variations and transfer of results from global to regional/detailed level.

The effects of the climate change:

Treated here are effects that a global climate change could inflict on ecosystems, political systems and the society as a whole.

The response of society to climate change:

Under this heading, the international actions that are made within the scope of the UN's climate conventions and other initiatives at local and global level will be discussed. Treated here is also how the society can be adapted to an ongoing climate change.

GIS and climate changes:

How are Geographic Information Systems used to facilitate and improve preparedness and understanding of climate changes in e.g. a municipality or a region? Which data are needed to analyse consequences and which methods are appropriate to use. How good are the results and what are the largest problems? Which solutions exist and which should be developed to improve analyses and results?

Course design

The course is a distance course and is distributed on the Internet. It is flexible designed which facilitate for the student to carry out the course on full-, half-, or part-time.

Assessment

Examination takes place through written take-home examination at the end of the course combined with passed written assignments during the course. For students who have failed the regular examination, additional occasion in close connection to this is offered.

Subcourses that are part of this course can be found in an appendix at the end of this document.

Grades

Marking scale: Fail, Pass, Pass with distinction.
To pass the entire course, approved examination, passed written assignments and passed project reports are required.

Entry requirements

For admission to the course, general entry requirements are required, English B and 90 credits completed courses including 30 credits courses in GIS. Equivalent knowledge in a different way acquired, give also admission to the course.

Subcourses in GISN22, GIS: GIS and Climate Change

Applies from V13

1301   Geographical Information Systems and Climate Change, 7,5 hp
      Grading scale: Fail, Pass, Pass with distinction