Faculty of Science

GISN32, 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 2021-05-05 to be valid from 2021-05-05, spring semester 2022.

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 general aim of the course is that the student, on completion of the course, should having acquired deeper theoretical and practical knowledge in spatial analysis and geographic information processing with special focus on 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 shall be able to:

- describe climate and causes of climate changes,
- describe the principles of climate models and how these operates,
- account for consequences of climate changes in global and regional perspectives,
- account for ongoing actions to decrease climate changes globally,
- 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 analysis using GIS.

Competence and skills

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

- collect knowledge in the thematic area in an independent way
- use simple climate models in combination with adapted geographic data,
- plan and carry out analyses of consequences at detailed and regional level with relevant geographic data,
- present results of analyses in written format and as maps for different audiences.

Judgement and approach

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

- compile, evaluate and discuss choice of analytical method to solve a given problem,
- critically review results of different analyses and with these as starting point suggest appropriate measures to decrease negative consequences,
- critically review and discuss the reliability of analyses,
- 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 basis to further work with climate changes and to consider climate changes in different types of activities with a focus on community planning and development. The contents of the course can be divided into different parts:

Basic climatology

During this section, knowledge of the climate system and its components is discussed, 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

This part treats effects that a global climate change could inflict on ecosystems, political systems and the society as a whole.

Mitigation activities relating 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. This section also deals with how the society can be adapted to an ongoing climate change.

GIS and climate changes

This part deals with how geographic information systems are used to facilitate and improve preparedness and understanding of climate changes in e.g. a municipality or a region and which data that are needed to analyse consequences and which methods are appropriate to use. Furthermore, the results are treated and identification of the largest problems and which solutions that are available 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 flexibly designed giving the student options to to carry out the course at full time or half time study tempo.

Assessment

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

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

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

Grades

Marking scale: Fail, Pass.
To pass the course, approved examination and passed written assignments are required.

Entry requirements

Entry to the course requires general entry requirements, English B/6 and 90 credits scientific studies, including 30 credits in GIS. Equivalent knowledge acquired in a different way, also gives admission to the course.

Further information

The course cannot be included in qualification together with GISN22 GIS and climate changes 7.5 credits.

Subcourses in GISN32, GIS: GIS and Climate Change

Applies from V22

2201   Exam and exercises, 7,5 hp
       Grading scale: Fail, Pass