



Department of Earth and Environmental Sciences

GISN11, GIS: GIS and Biodiversity, 7.5 credits

GIS: GIS och biodiversitet, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-03-01 and was last revised on 2013-01-17. The revised syllabus comes into effect 2013-01-17 and is valid from the spring 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.

Language of instruction:

Main field of study Specialisation

Physical Geography A1N, Second cycle, has only first-cycle course/s as entry requirements

Learning outcomes

The aim of the course is to give theoretical and practical understanding of the concept biodiversity (biological diversity) and highlight how GIS can be used to analyse different aspects of biodiversity.

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

- account for the background of and contents of the convention about biological diversity,
- at a general level describe the largest threats against biological diversity and give example of strategies to preserve and improve a biological diversity
- account for underlying concepts and theories for genetic, species and landscape diversity,
- describe biodiversity by means of index and understand advantages and disadvantages with different index,

- account for the main driving forces of biodiversity on gene-, species- and community level, both local and global,
- account for the main components in ecosystem modeling and their individual and joint functions in natural ecosystems,
- account for the importance of different geographic data formats in analysis and/or cartographic presentation of biological diversity,
- discuss strengths and weaknesses regarding the use of GIS for studies of biodiversity.

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

- analyse and describe the spatial distribution and the diversity of genes, species or vegetation types by means of different methods and index,
- handle relevant programs to analyse geographic data and present results for studies of biodiversity
- analyse, understand and solve problems related to different data sources and data quality,
- use and understand spatial modelling e.g. spatial distribution of vegetation types or species departing from different scenarios of climate change,
- independently carry out a study of biodiversity including components as: selection and transformation of data format, choice of analytical tools, analytical method and presentation of results and discuss these results from an ecological and geographic perspective.

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

- compile, evaluate and discuss choice of data and analytical method to solve a given problem
- critically review, evaluate and discuss the reliability of the method, analyses and results.

Course content

The course consists of six subparts:

- Introduction to the concept biodiversity (biological diversity). How was the convention about biological diversity developed and what components are included? How does the current situation for biological diversity (global and regional) look like?
- Genetic diversity. Basic concepts within the genetics. Sampling design for studies of genetic diversity and overview of a couple of examples of studies of genetic diversity.
- Species diversity. Which factors influence the species diversity and how does the global distribution of species diversity look like? Which index are used to describe the species diversity?
- Diversity of landscapes. What is a landscape and how is it shaped? The landscape structures and its organisation. An example: The traditional the cultural landscape. Which index are used to describe the structure and nature of the landscape?

- Global environmental changes and biodiversity. How do ecosystems function and which are the factors that influence its function? The climate and global vegetation patterns.
- Independent project where the student examines and describe the biological diversity in her or his native country and suggest strategies to preserve a biological diversity.

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 approval of written assignments and independent advanced assignments during the course. For students who have failed the regular examination, additional occasion in close connection to this is offered.

Grades

Grading scale includes the grades: Fail, Pass

To pass the entire course, approved examination, passed written assignments and passed reports from independent advanced assignments are required.

Entry requirements

General entry requirements including English B and 90 credits including 30 credits GIS.

Further information

The course may not be included in a higher education qualification together with GIS414 GIS and biological diversity, 5 credits.