



Department of Earth and Environmental Sciences

GISN08, GIS: Digital Remote Sensing and GIS, 7.5 credits

GIS: Digital fjärranalys och GIS, 7,5 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2007-06-14. The syllabus comes into effect 2007-07-01 and is valid from the autumn semester 2007.

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 study Specialisation

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

Learning outcomes

The course highlights the use of digital remote sensing (satellite images) for image interpretation of e.g. land use, understand the spectral properties of different objects and temporal differences at seasonal level or trends over longer periods for detection of changes.

The aim of the course is that students should be able to:

Knowledge and understanding

Account for:

- basic electromagnetic radiation theories and the influence of the atmosphere on incoming radiation,
- the radiometric and spectral resolution of a satellite image, in raw format as well as conversion to physical properties,
- image classification algorithms for digital satellite data as well as practical experience,
- reflection characteristics of different objects in different wavelength bands,

- accuracy assessment and sampling methods,
- how information is extracted from multiple satellite data to study seasonal effects
- how satellite data can be used to calculate trends for long time series as well as create a resultatkarta that describes change over the time.

Competence and skills

- carry out and report an image interpretation project independently
- extract statistics and other information from satellite data,
- on-screen digitising
- carry out both automatic and supervised classification of digital satellite data,
- carry out an accuracy assessment of a classification
- carry out analyses of satellite data integrated with other geographic information in a geographic information system.

Judgement and approach

The student is expected to be able to:

- evaluate and discuss choice of satellite data and analytical method to solve a given problem
- critically review, evaluate and discuss the reliability of classifications that are based on satellite data.

Course content

The course consists of the following six components.

- Electromagnetic radiation theory
- Satellite image classifications and classification accuracy assessment in theory and practice
- Classification algorithms, classification of high resolution satellite images
- Phenologic changes of vegetation during the growing season.
- A change detection study over a 20 years time series of satellite data.
- Down loading of free satellite data, importing data and conversion to physical units.

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 open book examination at the end of the course combined with grading of written assignments and project work 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 project reports are required.

Entry requirements

For admission to the course the following courses (or equivalent) are required: English B and 90 credits including 30 credits GIS.

Further information

The course may not be included in degree together with

GIS417 Digital remote sensing and GIS, 5 credits

NGE609 Remote sensing and biogeosphere dynamic processes, 10 credits

NGENXX Satellite remote sensing, 15 credits

VFT051 Remote sensing, 5 credits

VFTXX Remote sensing, 7.5 credits