Faculty of Science

NGEU08, Physical Geography: Satellite Remote Sensing, 15 credits

Naturgeografi: Satellitbaserad fjärranalys, 15 högskolepoäng

Second Cycle / Avancerad nivå

Details of approval

The syllabus was approved by Study programmes board, Faculty of Science on 2020-01-23 to be valid from 2020-01-23, spring semester 2020.

General Information

The course is offered as a commissioned education.

The course is an elective course for second-cycle studies for Master of Science with a specialisation in physical geography and ecosystem analysis, geomatics or atmosphere science and biogeochemical cycles.

Language of instruction: English

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

Learning outcomes

The aim of the course is that students upon its completion should have acquired the following knowledge and skills:

Knowledge and understanding
On completion of the course, the students shall be able to:

- describe the basic physical principles of remote sensing,
- account for the basic technical principles of satellites, sensors and ground receiving and treatment systems for data collection and the properties of available data from these systems

- account for the principles of digital image handling and image processing within remote sensing,
- describe important fields of application for satellite remote sensing in research, society and private activities, and
- illustrate and suggest use remote sensing in different climate areas and for various types of ecosystem and land use, and understand and account for limitations with the current technology.

Competence and skills

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

- independently analyse digital remote sensing data with existing image handling software packages,
- independent and in groups plan and carry out a field survey connected to an application of remote sensing
- based on literature choose right data and method for applying remote sensing in applications that concern soil, vegetation, water and human use of these resources
- integrate remote sensing data with other data in geographic information systems.
- actively contribute to discussions and present the results from remote sensing analyses in writing, orally and as maps for specialists and laymen, and
- collect knowledge in the field of remote sensing in a more or less independent way

Judgement and approach

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

- compile, evaluate and discuss choice of data and analytical method to solve a given problem by the use of remote sensing
- review, evaluate and discuss the reliability of analyses that are based on remote sensing data critically.

Course content

The aim of the course is to communicate advanced knowledge and skills within digital satellite remote sensing for studies of the environment and human influence on it. The course consists of two sub-parts of 7.5 credits each:

1. remote sensing theory and image processing
The sub-part treats basic physical principles, terminology for remote sensing and an overview of existing satellites and sensors. Further, data processing, basic image processing methods within remote sensing including radiometric and geometric correction, image enhancement, image classification methods and image transformations and integration of field data and thematic map production are dealt with.

2. Applications within environment, society and research
The sub-part treats the use of satellite remote sensing in important application fields e g environmental problems, agriculture, forestry, urban applications, water management or using satellite data in different time - and room resolution, using models in remote sensing, analysis of data from different climate areas and applications within society and research.

Course design

The teaching consists of lectures, laboratory sessions, field exercises, seminars, group work and project work. Participation in laboratory sessions, field exercises, seminars, group work and project work and thereby integrated other teaching is compulsory.

Assessment

Examination is done by a written exam at the end of the course and through evaluation of submitted work. Students who have not passed the ordinary examination are offered a re-examinations shortly after.

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, Pass with distinction.
To pass the entire course, approved examination and passed results of written assignments are required as well as completed project presentations and participation in all compulsory parts.

Entry requirements

For admission to the course, 90 credits science studies are required.

Further information

The course may not be included in a higher education qualification together with GISN09 Digital remote sensing and GIS, 10 credits, NGEN09 Remote sensing - digital methods 7.5 credits and NGEN08, Physical Geography: Satellite Remote Sensing, 15 credits.

Subcourses in NGEU08, Physical Geography: Satellite Remote Sensing

Applies from H21

2101   Satellite Remote Sensing, 15,0 hp
       Grading scale: Fail, Pass, Pass with distinction

Applies from V20

2001   Satellite Remote Sensing, 15,0 hp
       Grading scale: Fail, Pass, Pass with distinction