Reg No: NGGA29/20222

Faculty of Health, Science and Technology
Geo-Science

Syllabus

Remote Sensing and Digital Photogrammetry

Course Code:	NGGA29
Course Title:	Remote Sensing and Digital Photogrammetry *Fjärranalys och digital fotogrammetri*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
MAT (Surveying and Mapping)
NGA (Physical Geography)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2021-08-30, and is valid from the Autumn semester 2022 at Karlstad University.

Prerequisites
Geographic Information Systems I, 7.5 ECTS credits

Learning Outcomes
Upon completion of the course, students should be able to:
- describe methods of distance analysis and give examples of applications,
- give a basic account of the level of the physical properties of the atmosphere relevant to distance analysis and of the spectral qualities of different objects,
- describe the underlying technique of airborne laser scanning and give examples of applications,
- give an account of the theoretical foundations of photogrammetry,
- describe application areas for photogrammetric products,
- give an account of digital image processing techniques in photogrammetry for producing

ortophotos and height models,
- assess the pros and cons of photogrammetric methods in mapping and surveying, and
- take issues of sustainability and gender equality into account when working with remote sensing data.

Content
Students acquire knowledge of the electromagnetic spectrum, atmospheric physical properties and the spectral qualities of different object for an understanding of the potentials and limitations of the remote sensing technique. Different techniques for registering and producing digital images are treated, such as IR-thermography, multispectral scanning, radar and laser.

Digital images with several information layers are processed in computer programmes in laboratory sessions. Methods of image enhancing and image classification, including accuracy score assessment, are studied. The accessibility of remote sensing data are treated, along with the integration of raster data from distance analysis as one of several data sources in GIS.

Following on an overview of analogue and analytical photogrammetry until the development of digital photogrammetry, the following components are treated:
- data sources and planning photogrammetric projects
- the properties of digital images registered from planes or satellites
- methods for producing digital height models and ortophotos
- accuracy score assessment in photogrammetry applications
- alternative or supplementary methods for collecting data such as airborne laser scanning.

Instruction is in the form of lectures and laboratory work.

Student groups for the seminar assignment are created based on a gender equality perspective.

Reading List
See separate document.

Examination
Assessment is based on a written exam and hand-in assignments. Laboratory sessions are mandatory.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

Grades
One of the grades 5 (pass with distinction), 4 (pass not without distinction), 3 (pass, or U (Fail) is awarded in the examination of the course.

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.