



Faculty of Health, Science and Technology  
Geo-Science

# Syllabus

## Digital photogrammetry and visualization in 3D

<b>Course Code:</b>	NGGB48
<b>Course Title:</b>	Digital photogrammetry and visualization in 3D <i>Digital fotogrammetri och 3D-visualisering</i>
<b>Credits:</b>	7.5
<b>Degree Level:</b>	Undergraduate level
<b>Progressive Specialisation:</b>	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 2022-09-07, and is valid from the Spring semester 2023 at Karlstad University.

### Prerequisites

45 ECTS credits completed in the Surveying Technology and Geographic IT programme or the Surveying and Mapping programme, plus Geographic Information Systems I, 7.5 ECTS credits, and 2.5 ECTS credits completed in Remote Sensing and Digital Photogrammetry (7.5 ECTS credits), or equivalent

### Learning Outcomes

Upon completion of the course, students should be able to

- explain and describe basic photogrammetric concepts and data,
- plan and perform aerial photography with UAS,
- apply photogrammetric methods for producing photogrammetric material,
- explain relevant concepts and standards for 3D geovisualisation,

- use programs to create different 3D models (height, city and building models), and
- take issues of sustainability, gender equality, and data privacy into account when working with UAV and 3D data.

## **Content**

Digital photogrammetry

- Photogrammetric sensors and systems
- Photogrammetric survey: geometric properties, error estimates and correction
- Photogrammetric products: maps, height models and orthophotos
- Photogrammetric digital data standards
- Processing, resampling, compression, measuring in and image matching of digital images
- Quality aspects of aerial measuring and planning
- Planning and performing data collection with UAS

3D visualisation

- Collecting 3D data
- Representing 3D data
- Data formats and standards
- Analysing 3D data
- Software
- Height models, city models and building models
- Building Information Modelling (BIM)

Project groups are created based on a gender equality perspective.

## **Reading List**

See separate document.

## **Examination**

Assessment is based on individual written hand-in assignments and an oral and written report of the group project. Submissions for assessment must clearly indicate individual contributions.

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 with Some Distinction), 3 (Pass), or Fail (U) 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.

