AH2915 Laser Scanning Technology 7.5 credits

Laserskanning

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for AH2915 valid from Autumn 2019

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

- Bbachelor's degree in civil engineering, urban planning, geomatics, engineering physics, computer science, statistics, or mathematics. mathematics.
- At least 3 ECTS in each of the following: Programming , Linear Algebra, Calculus in One Variable, and Probability & Statistics;
- Proficiency in English corresponding to English B

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The overall goal is to give the students theoretical and practical knowledge about laser scanning measurement procedure, data processing and modelling. After the course the students should be able to:

- Explain the principle for terrestrial and airborne laser scanning
- Explain the principle of photogrammetric production of point clouds
- Evaluate different methods for production of point cloud and choose an appropriate method for given application
- Plan airborne laser scanning projects
- Plan and perform terrestrial laser scanning projects
- Produce products from point cloud and assess their quality

Course contents

- Basic principles of laser scanners and electronic distance measurement
- Terrestrial and air-born laser scanning
- Photogrammetric metod of point cloud production
- Metrological aspects: error analysis and calibration
- Transformation (registration) of multiple scans
- Different methods for geo-referencing of laser scanning data
- Basic principles of inertial navigation system, its combination with GPS and its use for georeferencing of airborne data
- Different methods for point cloud visualization
- Data processing and modeling

Disposition

Lectures 20h

Laborations 48h

Course literature

Jie Shan and Charles K. Toth (2009). Topographic Laser Ranging and Scanning Principles and Processing. CRC Press 2009, Print ISBN: 978-1-4200-5142-1, eBook ISBN: 978-1-4200-5143-8

HDS training manual.

Examination

- LAB2 - Laboratory Work, 2.0 credits, grading scale: P, F
- TEN1 - Examination, 2.5 credits, grading scale: A, B, C, D, E, FX, F
- PRO3 - Project, 3.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Approved lab reports

Approved project report

Närvaro vid fältmätningar

Oral examination, at least grade E

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.