Master’s Programme in

Geoinformatics

Geoinformatics is a modern field of science related with computers, communication technologys, mobile and location aware applications, applied mathematics and statistics and decision making tools. The Master’s Programme in Geoinformatics offers studies in three subject areas.

Geodesy, Positioning and Navigation

Geodesy and Positioning is about techniques used for obtaining precise georeference objects on the Earth surface. Navigation does the same for sensors on moving platforms, also in real time.

The programme offers in-depth understanding of GNSS, today’s dominant location sensor technology, while also providing essential mathematical tools for mapping the Earth and the natural and built environment.

Earth System Geodesy places it all in a broader context of Earth science, teaching students to understand the Earth in her full complexity as a living, moving, changing planet.

Geoinformation Technology and Cartography

Geoinformation technology introduces the tools required in geospatial data modeling and analysis. Geospatial data models include 3d-models from the largest to small scale views of the world. In spatial analysis both mathematical and computational methods are used in their spatial versions. In analysis, visual methods play an important role and traditional cartography is extended with interactive explorative methods. Cartography, however, is still an important topic within Geoinformatics. Maps appear in many digital forms and contexts as well as in printed pieces of cartographic art.

Geoinformation technology studies can be well supported by courses of computer science or any other related subject such as applied mathematics or even graphic design.

Photogrammetry, Laser Scanning and Remote Sensing

Photogrammetric methods allow the acquisition of 3D point clouds, creation of maps, 3D models and orthoimages, monitoring movement and change, interpretation of scenes, image-based navigation, and quality estimates of measurements.

Laser scanning methods provide 3D point clouds, data beneath forest canopies, tomographic information of sparse structures, and information of surface reflectances.

Remote sensing methods enable monitoring of land use, changes, and health of the environment, measuring of 3D structures, creation of orthoimages, and classification of materials.

Master’s thesis (30 cr)

Elective studies (30 cr)

Major studies (30 cr)

Students select 30 cr courses (5 cr each)
- Advanced Laser Scanning
- Advanced Photogrammetry
- Advanced Remote Sensing
- Advanced Spatial Analytics
- Digital Image Processing and Feature Extraction
- Earth System Geodesy
- GNSS Technologies
- Least-Squares Methods in Geoscience
- Topographic Information Management
- Project course (10 cr)

Major studies, common (30 cr)

Obligatory courses (5 cr each)
- From Measurements to Maps
- Geodesy and Positioning
- Introduction to Spatial Methods
- Photogrammetry, Laser Scanning and Remote Sensing
- Spatial Analytics
- Visualization of Geographic Information

Responsible professors lecturers and university lecturers: Henrik Haggrén, Miina Rautiainen, Martin Vermeer, Kirsii Virrantaus

aalto.fi/studies

11/2015 (changes possible)