Swedish University of Agricultural Sciences

P000056, Introduction to GIS for applications in forest and landscape, 3.0 Hp

Syllabus

Finalized by: Finalized by: FUN, 2023-09-12, 2023-09-12

Valid from: VT2024

Level within study regulation:

Third cycle

Subject:

- Technology

Grading scale:

Pass / Failed

Course language:

Swedish

Entry requirements:

Admitted to studies at advanced level, doctoral education.

Objectives:

The aim with the course is for the student to get a basic understanding and practical experience in Geographic Information Systems (GIS), specifically within forestry applications and within a landscape matrix context. This will be achieved by theoretical GIS-basics, data sampling and management, map projections and reference systems, spatial analysis and visualization.

After completed course the student should be able to

- understand the basics of GIS theory

- perform editing in different data structures

- perform queries in (non-/spatial) large datasets

- perform basic spatial analysis

- describe fundamental concepts of remote sensing

- describe the landscape and landscape change with the help of GIS

- describe origin and structure of spatial data

- apply quantitative analysis of spatial forest and landscape attributes

- critically assess precision and usage of GIS.

Content:

The course gives an introduction to GIS systems. This refers to database management, visualisation and processing of spatial data and information. In the course the students will learn about origin and structure of spatial data, in vectorised features and in rasters, and how this information can be assessed and visualized. Current open data sources for forestry attributes and landscape data is part of learning activities and the students have the opportunity to critically assess and use the contemporary used GIS in Swedish forestry. Exercises in GIS is combined with knowledge transfer on how landscape and land use changes over time. The course includes quantitative analysis of forest attributes and how to sample own data in a field mobile application.

The course is organized in four modules. First module introduces the basics of GIS and geospatial data, and outlines main components of GIS interface. Second module addresses main features of vector data, attribute table management, and basics of spatial analysis based on the vector data. Third module introduces raster data and its main sources, basics of satellite imagery, and spatial analysis based on raster data. Fourth module is focused on an applied landscape analysis involving field data collection linked to GIS software.

The course have no mandatory elements but to write and peer review the assignments, which is the basis for examination.

The course will more specifically use ArcGIS PRO and R studio for the exercises as long as the status of licensed ESRI software is maintained for SLU students. For field based data collection, we will introduce ESRIs software ArcGIS online and Field maps, or similar corresponding software if the development changes over time.

Modes of assessment:

Write and peer review the assignments, is the basis for examination. - If a student has failed an examination, the examiner has the right to issue supplementary assignments. This applies if it is possible and there are grounds to do so.

- The examiner can provide an adapted assessment to students entitled to study support for students with disabilities following a decision by the university. Examiners may also issue an adapted examination or provide an alternative way for the students to take the exam.
- If this syllabus is withdrawn, SLU may introduce transitional provisions for examining students admitted based on this syllabus and who have not yet passed the course.
- For the assessment of an independent project (degree project), the examiner may also allow a student to add supplemental information after the deadline for submission. Read more in the Education Planning and Administration Handbook.

Organisation:

Department of Southern Swedish Forest Research Centre

Supplementary information

Other information:

- The right to participate in teaching and/or supervision only applies for the course instance the student was admitted to and registered on.
- If there are special reasons, students are entitled to participate in components with compulsory attendance when the course is given again. Read more in the Education Planning and Administration Handbook.