

English Title:

An introduction to Geographic Information Systems (GIS)

Swedish Title:

En introduktion till Geografiska informationssystem (GIS)

Higher Education Credits:

4,5 (3 weeks)

Subject: Other Social Science

Possible Additional Subjects: Rural Development, Agrarian History, Landscape Architecture, Environmental Communication

Course Type: General course

Language: English

Prerequisites: Admittance to a PhD program.

Objective:

Upon completion of the course, the student should:

- Understand different kinds and uses of geographic information and cartographic principles.
- Become familiar in the main uses of and important sources for vector and raster data.
- Understand the basic principles of remote sensing in general, and, in particular, understand how NDVI is calculated and used.
- Be able to produce different kinds of vector and raster maps, taking into account various potential sources of error and controlling for potential misrepresentation of the underlying geographic information.
- Be able to critically read maps, and put them in context, so that one can uncover meanings, implications and politics from maps that are not always immediately evident.

Content:

This course is an introduction to Geographic Information Systems (GIS). As an introductory course there are no prerequisites, but the level of ambition in the course will be targeted to PhD students. Students will become familiar with the main uses GIS in general. More specifically, students will work with vector and raster data in hands-on exercises where students learn basic GIS skills, such as: manual vectorization; finding and processing different sources of geographic data, including satellite data; “wrangling” geodata so that it is suitable for geographic analysis; calculating Normalized Difference Vegetation Index (NDVI) based on satellite data; making different kinds of maps, in particular choropleth maps; making final, “print-ready” maps that convey useful information in aesthetically appropriate ways to map-users and that can be inserted into texts. A critical dimension on GIS and cartography will also be presented and discussed in this course: i.e. that maps are not neutral – they simultaneously reflect and promote particular power relations and/or political agendas, even as they may conceal these commitments. In this sense, we will discuss in this course how maps can be read critically to uncover meanings, implications and politics that are not always evident from cursory inspection. The forms of instruction include lectures in which the basic principles of cartography, GIS and remote sensing are presented and explained. Some of the lectures will be in a tutorial format where the teacher will present information, but where different aspects of GIS and map-making will be discussed actively by students as well, based in part on readings. Another important form of instruction are exercises where students will receive detailed instructions and the necessary data in advance, but also receive active help from the responsible teacher. Finally students will receive an assignment to make their own map(s), which should be connected to their own PhD

research, and which will be presented, discussed and assessed in a seminar format at the end of the course.

Examination:

Seminar presentation of own map(s) explaining the purpose of the map, why it is important, and how it is connected to the student's PhD research. The presentation should also include an account of the different steps taken to produce the map, and how potential sources of error were avoided.

Contact for application and further information:

Name: Brian Kuns

Email: brian.kuns@slu.se

Literature:

The following book will be obligatory for this course

- Monmonier, Mark (2018). *How to Lie with Maps*. University of Chicago Press: Chicago
- Mitchell, Andy (2020). *The ESRI Guide to GIS Analysis, 1: Geographic patterns and relationships*, ESRI Press: Redlands, CA

And the following books are recommended:

- Brewer, Cynthia (2015). *Designing Better Maps: A Guide for GIS Users Second Edition*. ESRI Press: Redlands, CA.
- Janson, Ulf (ed.). 2011. *Agriculture and Forestry in Sweden since 1900, National Atlas of Sweden*. KSLA: Stockholm.

Additional Information:

The primary software applications used in this course will be QGIS, which is “free and open source software” (FOSS), and Microsoft Excel. QGIS works on all computer platforms (Microsoft, Apple and Linux). The course may also involve the use of a limited amount of scripting/coding on platforms or with programs that either are completely FOSS or in any case free to use and that work on all operating systems.