

SOSGEO4023 – Spatial Data Analysis

Course content

Everything that happens, happens somewhere—whether events such as crime or conflict, individuals' interactions with neighbours and institutions, or mobility within cities and across countries. These processes also unfold in specific socio-economic and physical contexts. This course examines how spatial data can be used and combined to answer socio-spatial questions central to both sociology and human geography.

The course introduces analytical approaches for working with diverse spatial data, including maps, surveys, administrative registers, satellite imagery, and other georeferenced sources. Students learn to create maps, analyse point and area data, and link individual-level information (such as survey respondents) with broader socio-economic and environmental spatial data. Core analytical topics include spatial point pattern analysis, spatial autocorrelation and dependence, spatial regression, distance-based measures, and network analysis of mobility and connectivity. The course also covers principles of spatial visualisation and cartography and discusses uncertainty and error in spatial data.

Learning outcome

Knowledge objectives

Throughout this course, you will acquire in-depth knowledge about

- The specific properties of spatial data and how they differ from non-spatial data
- Spatial relationships, neighbourhood structures, and spatial dependence
- Core methods in spatial data analysis, including point patterns, spatial regression, and networks
- Principles of spatial visualisation and cartographic design
- Sources of uncertainty and error in spatial data

Skill objectives

Throughout this course, you will learn how to

- Collect, manage, and preprocess spatial data from diverse sources
- Analyse spatial patterns using methods such as spatial autocorrelation and point pattern analysis
- Apply regression models tailored to spatial data
- Quantify distances, proximity, and connectivity, including basic network analysis
- Visualise spatial data and communicate analytical results clearly
- Prepare spatial datasets for further statistical analysis

General competence

This course will enable you to conduct independent spatial data analyses of socio-spatial phenomena at the master's level. You will be able to assess spatial methods critically and

results, reflect on the limitations and uncertainties of spatial data, and communicate findings effectively in written and visual formats.

Admission to the course

Admission to the course is dependent on admission to one of the master's degree programs at the Department of Sociology and Human Geography.

Recommended previous knowledge

It is recommended that students have completed SOSGEO4000 or equivalent, and have basic experience with GIS and R. A preparatory program will be made available for students to complete before the start of the course.

Teaching

Lectures and seminars.

The practical seminars will make use of R and GIS in a data lab.

Examination

Individual project report.

Language of examination

The examination text is given in English. You may submit your response in Norwegian, Swedish, Danish or English.

Grading scale

Grades are awarded on a pass/fail scale. Read more about the grading system.