



FAG3170 Spatial Data Analysis in Practice 7.5 credits

Tillämpad rumslig dataanalys

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

Establishment

Course syllabus for FAG3170 valid from Spring 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Anyone who is a PhD student in any relevant subject area (e.g., Urban and Regional Planning, Economics, Real Estate, Geography, Demography, Criminology, Environmental Sciences) is eligible to take this course. However, having knowledge in Geographical Information Systems and/or basic statistics is an advantage.

The first week provides students with basic introduction to the course and tools. A set of introductory practical exercises will be provided to those unfamiliar with ArcGis, GeoDa and ScanStat. The first chapters in Haining (2003) should be read by the students before the first class (available in BILDA three weeks before the course starts).

Language of instruction

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

Intended learning outcomes

In this course students are trained to become users of spatial data analysis techniques. Students will gain a broad knowledge of the diversity of current approaches, which methods are at hand and examples of applications using spatial data analysis in different fields (e.g., economic geography, epidemiology and urban safety). The learning outcomes of the course are:

- identify the appropriate approaches/techniques in spatial data analysis
- use relevant knowledge to solve spatial-related problems using real-life data sets and spatial statistical tools, including visualization, interpolation, pattern identification and modeling (spatial regression analysis)
- develop both technical and social skills by working in pairs to solve real-life problems using different statistical software
- to analyze results of practical exercises and be able to point out challenges and advantages with those tested techniques
- develop, interpret and critically reflect upon results of a case study using one (or more) spatial data analysis technique(s) learned during the course.
- be able to use their new skills in spatial data techniques and communicating them to an audience (written, graphically and orally).
- recognize and express the value of incorporating the spatial dimension of phenomena and processes in social sciences

Course contents

The course is divided in three parts. In the first part the nature of the geographical data is discussed whilst the identification of spatial patterns is the focus in the second part of the course. The third part refers to confirmatory spatial data analysis using regression analysis, its applications and assessment (case study).

PART I - Lecture 1 - Thinking spatially: introduction to GIScience, Lecture 2 - The nature of spatial data, Lecture 3 - Data quality.

PART II - Lecture 4 – Spatial structure of spatial data, Lecture 5 - Non-parametric methods of spatial interpolation, Lecture 6 - Areal interpolation. Lecture 7 - Exploratory spatial data analysis (ESDA) and cluster detection methods Lecture 8 –Introduction to confirmatory analysis.

PART III - Lecture 9 –Regression analysis. Lecture 10 – Implementing space in social sciences: a summary, Lectures 11- 12 – Applications, Project (study case) and Project presentation.

Course literature

The readings required for the course are: a book of Haining 2003 "Spatial data analysis: theory and practice"; a collection of articles; and excerpts from books. All lectures require pre-reading.

The book and the collection of articles to be read for each meeting are handed out at course start.

Examination

- INL1 - Homework, 7.5 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

In order to pass the course, students need to:

- attend lectures and perform practical exercises
- participate in discussion in class ("forum-time" and hand in results on time)
- participate in and contribute to the work with the case study in group (maximum 2 individuals) that involves the development, the interpretation and critical reflection of results using spatial data analysis techniques learned during the course. Use of own datasets is encouraged.
- Present their case study in a poster session at the department (written, graphically and orally). Department personnel (researchers, PhD students) and peers assess each group performance together with the content presented in the poster. The written report is handed in to the head teacher.

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.