Course Title: Statistical Analysis for Geographers

Teaching Hours: 3 hours per week

Course Description

The course *Statistical Analysis for Geographers* introduces students to the fundamental principles, methods, and tools of quantitative analysis, with particular emphasis on their application to geographical research. Its main objective is to develop students' statistical reasoning and their ability to collect, organize, describe, analyze, and interpret spatial, demographic, socioeconomic, and environmental data.

The course begins with the basic concepts of statistical data and descriptive data presentation. It then examines measures of central tendency and dispersion, highlighting their role in describing and comparing geographical variables, such as population characteristics, climatic conditions, and socioeconomic indicators. Students are subsequently introduced to the fundamental principles of probability theory and to the main characteristics and applications of the binomial, Poisson, and normal distributions. The course concludes with correlation analysis, providing students with the statistical tools needed to investigate and interpret relationships between geographical variables.

Throughout the course, statistical concepts and methods are systematically linked to geographical applications, enabling students to transform raw data into meaningful information and draw evidence-based conclusions about spatial phenomena.

Learning Outcomes

Upon successful completion of the course, students will be able to:

Knowledge and Understanding

- Explain the importance of statistical analysis in investigating geographical and spatial problems.
- Understand the fundamental concepts of descriptive statistics, including population, sample, and statistical variables.
- Distinguish between and explain measures of central tendency and dispersion.
- Understand the basic principles of probability theory.
- Describe the characteristics and identify appropriate applications of the binomial, Poisson, and normal distributions in geographical research.
- Explain the concept of correlation and its role in examining relationships between variables.

Skills and Competences

- Collect, organize, summarize, and present statistical data using appropriate tables and diagrams.
- Calculate and interpret measures of central tendency and dispersion for geographical datasets.
- Apply basic probability distributions to model real-world geographical phenomena.

- Analyze correlations between two geographical variables and draw evidence-based conclusions.
- Use appropriate computational tools and statistical software to process, analyze, and visualize geographical data.

Teaching and Learning Methods

The learning outcomes are achieved through a combination of theoretical lectures, problem-solving exercises, case studies, and practical applications using geographical datasets.

Teaching activities draw on examples from human and physical geography, including population distribution, demographic change, population ageing, precipitation patterns, seismic activity, and socioeconomic indicators. Students also undertake practical exercises involving the calculation, visualization, and interpretation of statistical measures, thereby connecting theoretical knowledge with empirical geographical research and spatial analysis.