SGO1910 – Introduction to Geographical Information Systems (GIS)

Written school exam

<mark>November 20 at 9:00 AM (3 hours).</mark>

The exam consists of three parts:

- Part 1 involves five questions (30 % of grade)

- Part 2 involves two questions (35 % of grade)

- Part 3 involves answering one questions (35 % of grade)

You may submit your responses in Norwegian, Swedish, Danish or English.
It is allowed to use English terms if you use one of the Scandinavian languages.

Examination support material

Dictionaries handed in before the examination.

Questions during the exam

If you have any questions during the exam, please contact the senior supervisors in the room.

After the exam

After the examination you will see your submission under **Archive**.

Good luck!

Part 1: Short Answer Questions (30% of grade)

Give a short answer to *all* five questions. You are welcome to use examples.

Q1: Describe what makes spatial data unique compared to non-spatial data. Provide one example to illustrate your point (max 150 words).

Q2: Explain what vector and raster data are with an example for each and note one key difference between them (max 150 words).

Q3: Summarize the concept of the Modifiable Areal Unit Problem (MAUP) in GIS (max 150 words).

Q4: Outline Tobler's first law of geography and its significance in spatial analysis (max 150 words).

Q5: Briefly explain the necessity of coordinate systems and map projections in GIS (max 150 words).

Part 2: Applied Questions (35% of grade)

Answer *both* questions.

Q1: Identify and describe common sources of spatial data in raster and vector formats, with one example for each. Discuss one advantage and one limitation of each format in GIS (max 300 words).

Q2: Discuss the potential sources of error in spatial data and explain how uncertainty can affect different stages of GIS analysis (max 200 words).

Part 3: Essay Question (35% of grade)

Q1: The figures provided display results from two types of spatial autocorrelation analyses of the percentage of votes to the labor party (Arbeiderpartiet). On the left the unit of analysis is municipalities, and on the right electoral districts in Oslo. Describe what each figure represents, and interpret the outcomes shown. Discuss the implications of these results for understanding spatial patterns in the data (max 500 words).