EPFL

ENG-440 **Spatial statistics and analysis**

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Cursus	Sem.	Type
Civil & Environmental Engineering		Opt.
Digital Humanities	MA1, MA3	Opt.
Energy Management and Sustainability	MA1, MA3	Opt.
Environmental Sciences and Engineering	MA1, MA3	Opt.
Mineur STAS Russie	H	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**3 weekly**
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

The main objective is to make the students understand the importance of the spatial issues in environmental sciences and engineering, for example for mapping and interpolation. Presentation of different concepts and techniques devoted to spatial data.

Content

- Modeling, analysis and statistics of continuous phenomena (mainly Geostatistics)
- Modeling, analysis and statistics of discrete phenomena
- Classification / regionalization
- Analysis of topographical data
- Exercises and application projects (combining the different components of the course)

Learning Prerequisites

Recommended courses

Basics of Statistics
Basics of GIS

Learning Outcomes

By the end of the course, the student must be able to:
- Expound importance of spatial dimension in the analysis of environmental data
- Apply basic geostatistical tools for structural inference (variogram) and interpolation (kriging)
- Assess / Evaluate the global and local spatial dependence within a spatial dataset (autocorrelation)
- Compute most important landscape and spatial metrics
- Design complex spatial analysis processes

Transversal skills

- Use a work methodology appropriate to the task.

Teaching methods

Ex-cathedra + exercises + project

Assessment methods

30 % Two spot written checks during the semester (one for each teacher)
70 % One written exam (in two parts of 90 min each) during the exam session