EPFL | COURSEBOOKS

/ Study plans / Coursebooks / Exploratory data analysis in environmental health

ENV-444

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Theory | Exercises | Time for group work

	Period 1 **Monday 8^{15} à 9^{00}**	Period 2 **Monday 9^{15} à 10^{00}**	Period 3 **Monday 10^{15} à 11^{00}**	Period 4 **Monday 11^{15} à 12^{00}**
Week 1 **Introduction** September 9, 2024	**S. Joost** – Introduction to exploratory spatial data analysis and environmental health	**S. Joost** – Description of the course, explanations about requirements	**Exercise 1a** – Introductory readings (Morgenthaler and Anselin)	**Exercise 1b** – Introductory readings (Morgenthaler and Anselin) + short report writing = answer questions
Week 2 **Exploratory Spatial Data Analysis** September 23, 2024	**S. Joost** – Typical exploratory approach - Structuring spatial data analysis	**S. Joost** – Cognitive processes for geodata exploration	**Exercice 2a** – Basic data handling in Geoda	**Exercice 2b** – Histograms and other plots in Geoda + short report writing (include parts a and b)
Week 3 **Population epidemiology** September 30, 2024	**S. Joost** – Study of the relationship between health and place – The concept of exposome	**M. Nehme** – Introduction to population epidemiology	**Exercice 3** – Environmental dataset for Geneva	**Exercice 3** – Environmental dataset for Geneva + short report writing
Week 4 **Spatial epidemiology** October 7, 2024	**S. Joost** – Introduction to spatial epidemiology	**Exercice 4** – Health data handling and aggregation	**Exercice 4** – Health data handling and aggregation + short report writing	Start discussing the constitution of groups
Week 5 **Order stats and rate smoothing** October 14, 2024	**S. Joost** – Order statistics and rate smoothing	**S. Joost** – Confounding factors and variable adjustment	**Exercice 5** – Confounding factors and variable adjustment + short report writing	Constitution of ~8 groups Finalize group composition in Moodle
Holiday				
Week 6 **Writing of a scientific paper** October 28, 2024	**S. Joost** – Structure of a scientific paper – Collaborative writing and open data publication	**S. Joost** – Instructions for the description of the group semester project	**Exercice 6** – Prepare and upload open dataset to Zenodo	Time for group discussion and work on project
Week 7 **Medical cohort studies** November 4, 2024	**S. Joost** – Geographically Weighted Regressions (GWR)	**M. Nehme** – Medical cohorts, presentation of Specchio and Bus santé studies	**Exercice 7** – Geographically weighted Regression (GWR)	Submission of **description of the semester project** **Deadline**: Nov 8, 23h59
Week 8 **Spatial clustering** November 11, 204	**S. Joost** – Hierarchical Ascendant Classification (HAC) and Principal Component Analysis (PCA)	**S. Joost** – Exploratory Spatial Data Analysis for the analysis of cancer screening participation rate	**Exercise** 8 – PCA and HAC with GeoDa	Time for group discussion and work on project
Week 9 **Relative risk** November 18, 2024	**S. Joost** – Spatial Relative Risk (SPARR)	**Exercice 9** – Spatial Relative Risk (SPARR)	**Exercice 9** – Spatial Relative Risk (SPARR)	Time for group discussion and work on project
Week 10 **Metabolic syndrome** November 25, 204	Time for group discussion and work on project	Time for group discussion and work on project	**M. Nehme** – Environmental pollution and metabolic syndrome	Time for group discussion and work on project
Week 11 **Thematic mapping** December 2, 2024	**S. Joost** – Thematic mapping, synthetic reminder and analytical design (how to improve thematic maps)	**A. Ladoy** (DGS Vaud) – How geographic information can be used in the domain of public health policies application and elaboration	Time for group discussion and work on project	Time for group discussion and work on project
Week 12 **Work on semester project** December 9, 2024	Time for group discussion and work on project	Time for group discussion and work on project	Time for group discussion and work on project	Time for group discussion and work on project
Week 13 **Presentation semester projects** December 16, 2024	Presentation of semester projects (collective presentation)	Presentation of semester projects (collective presentation)	Presentation of semester projects (collective presentation)	Presentation of semester projects (collective presentation)
Deadline : submission of collective scientific paper on January 6 (Monday), 2025, at 23h59				

*For all exercises, a one page individual short report (compte-rendu) must be uploaded on Moodle. The submission of 7/9 short reports (9 exercices) gives 20% of the total grade. In case of fraud or cheating the 20% are lost.