DOCTORAL SCHOOL OF INFORMATICS
COMPLEX EXAM SUBJECT

Spatial Data Visualisation (main subject)

The exam covers the visualization of geospatial data, emphasizing the optimal representation of cartographic conventions and user requirements. Students are expected to demonstrate understanding of the informatics foundations of digital cartography and GIS, including the theory and practice of raster and vector data storage, as well as the most commonly used file formats in GIS and digital mapping. Knowledge of the software tools used to produce maps—both for paper and web-based applications—is required, including an understanding of software types and, in some cases, specific programs. A key component of the exam concerns visualization principles, particularly color representation for both print reproduction and digital display. Students should also be familiar with introductory pre-press techniques relevant to print cartography.The course emphasizes output-oriented skills, including the characteristics and use of cartographic output devices such as printers, plotters, and web platforms. Students are expected to understand the specific requirements of screen display, global and national web map services, relevant standards, and current development trends in web cartography.Upon completion of the exam, students should be able to select and apply appropriate visualization methods and cartographic tools for both traditional and digital outputs in research contexts.

- Principles and methods for effective visual representation of spatial data.
- Understanding traditional cartography and customised map design to audience requirements.
- Theory and practice of raster and vector data storage.
- Commonly used formats, their properties, and applications.
- Overview of software types and, where relevant, specific tools for paper and web-based mapping.
- Principles of color usage for print and digital display in cartographic outputs.
- Introductory skills for preparing maps for print reproduction.
- Knowledge of printers, plotters, and other output technologies for map production.
- Characteristics of screen display, global and national web map services, standards, and development trends.
- Selecting and applying appropriate tools, methods, and outputs in scientific contexts.

Literature

- Kraak, MJ–Ormeling, F.: Cartography, Visualization of Spatial Data, Fourth edition, CRC Group, 2021, 261 p., ISBN 9781138613959
- United Nations: Mapping for a Sustainable World, United Nations, 2020, DOI: https://doi.org/10.18356/9789216040468c001
- Field, K.: Cartography, ESRI Press, 2018, 576 p., ISBN: 9781589484399
- Del Lima, M.: Handbook of Cartography, Callisto Reference, 2015, 326 p., ISBN 1632393778
- Cynthia Brewer: Designing Better Maps, 250 p., ESRI Press, 2015, ISBN 9781589484405