DOCTORAL SCHOOL OF INFORMATICS
COMPLEX EXAM SUBJECT

Navigation technologies
(main subject)

The exam covers the principles, technologies, and applications of navigation and mobile mapping. Students are expected to demonstrate an understanding of navigation techniques, including the use of maps, compasses, and modern GNSS technology to determine position and plan routes. The course also addresses mobile mapping, focusing on the collection of geospatial data using mobile devices such as smartphones and tablets. Students should be familiar with various types of data collected in mobile mapping, including GNSS data, photographs, videos, and sensor readings, and understand their applications in areas such as street-level mapping, asset management, and disaster response. Students are required to integrate both theoretical knowledge and practical skills, demonstrating the ability to apply navigation and mobile mapping technologies effectively in research and applied contexts.

- Fundamentals of determining position and planning routes.
- Use of maps, compasses, and other manual methods.
- Modern navigation using satellite signals for positioning and routing.
- Concepts and goals of mobile geospatial data collection.
- Smartphones, tablets, and other portable data collection tools.
- GNSS data, photographs, videos, and sensor readings.
- Street-level mapping, asset management, disaster response, and other use cases.
- Combining positioning technologies with data collection for practical solutions.
- Applying knowledge and techniques in research and applied mapping contexts.

Literature

- Wilmott, C. (2020). Mobile mapping: Space, cartography and the digital (p. 346). Amsterdam University Press. ISBN: 9789462984530. Download here: https://library.oapen.org/handle/20.500.12657/37349
- Farman, J. (2020). Mobile interface theory: Embodied space and locative media. Routledge. eISBN: 9781405124331
- Jin, S. (Ed.). (2012). Global navigation satellite systems: signal, theory and applications. BoD–Books on Demand. ISBN978-953-307-843-4
- Google Maps: https://www.google.com/maps
- Waze: https://www.waze.com/
- HERE Maps: https://www.here.com/
- OpenStreetMap: https://www.openstreetmap.org/
- ArcGIS Online: https://www.arcgis.com/home/signin.html
- MapQuest: https://www.mapquest.com/
- Bing Maps: https://www.bing.com/maps/
- TomTom Maps: https://www.tomtom.com/en_gb/
- OsmAnd: https://osmand.net/
- Sygic GPS Navigation & Maps: https://www.sygic.com/