

ERM153 Spatial Data Management with Geographic Information Systems Applications.

- Semester: First
- Type: Elective
- Instructor: Sotiris Koukoulas
- ECTS Credits: 6

The main aim of this course is to introduce students to basic concepts of GIS and data management and analysis.

The first four lectures and practicals introduce the students to basic GIS concepts regarding the type of data used, data input, data editing, data conversions (Vector to Raster and Raster to Vector), data filtering using logical queries, data coding, coordinates transformation and projection systems. Subsequently, the course deals with thematic mapping and some caveats in mapping.

For the rest of the course, students become familiar with data analysis (overlay techniques such as buffer, clip, union and map algebra) and their applications to real world problems. Working with 2.5D surface data (spatial interpolation) and spatial autocorrelation are also part of the course. Finally, a site suitability analysis is carried out based on overlay techniques studied before and multi-criteria analysis.

Assessment

Students' evaluation is project based (project outputs and a scientific report to be submitted).

Explicitly defined assessment criteria are accessible to students in the regulations of the Joint Postgraduate Program (Article 15).

Indicative Bibliography

- Heywood I., S. Cornelius, S. Carver, 2012. An Introduction to Geographical Information Systems, Pearson, 4th Edition.
- Burrough P.A., R.A. McDonnell and C. D. Lloyd. 2015, Principles of Geographical Information Systems, Oxford University Press, 3rd Edition
- Longley P.A., M. F. Goodchild, D. J. Maguire and D. W. Rhindm, 2015. Geographic Information Science and Systems, Wiley, 4th Edition.
- Longley P.A., M. F. Goodchild, D. J. Maguire and D. W. Rhindm, 2015. Geographic Information Systems, Abridged Edition
- Lo C. P. and Yeung A.K.W. 2005. Concepts and Techniques of Geographic Information Systems. Prentice Hall.
- Monmonier M., 2018. How to Lie with Maps, University of Chicago Press, 3rd Edition
- Slocum T.A., R. B. McMaster, F. C. Kessler and H.H. Howard, 2022. Thematic Cartography and Geo-visualization, CRC Press, 4th Edition
- O'Sullivan D. and D. Unwin, 2010. Geographic Information Analysis, Wiley, 2nd Edition
- Malczewski J. and C. Rinner, 2015. Multi-criteria Decision Analysis in Geographic Information Science, Springer.

Related academic journals:

- Computers, Environment and Urban Systems
- Applied Geography
- International Journal of Applied Earth Observation and GeoInformation
- *Cities*