UNIVERSITY OF WARMIA AND MAZURY IN OLSZTYN

Faculty of Geoengineering

Course title: GEOSTATISTICS

ECTS credit allocation (and other scores): 3

Semester: spring

Level of study: ISCED-7 - second-cycle programmes (EQF-7)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 45

Course coordinator/ Department and e-mail: Marek Ogryzek, Ph.D., Institute of Geography and Land Management, marek.ogryzek@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Exploratory analysis of spatial data. Spatial creation of probability and improbability measure. Semivariogram modelling. Map creation using deterministic interpolation methods. Geostatistical volatility modelling. Creating a one-variable estimation, coded data and multivariate estimation. Verification of the correctness of geostatistical models using the cross-validation procedure and jackknifing. Evaluation of the quality of the estimations and building a spatial simulation.

LECTURES: Visualizing spatial data. Geostatistical methods - mathematical foundations. Geostatistical data analysis. Spatial covariance, correlation and semi-variance. Deterministic and stochastic interpolation methods. Anisotropic and isotropic modeling. One-variable and multivariable estimations, estimation of the local probability distribution. Assessment of the estimation quality. Estimation quality statistics. Validation of the estimation results. The principles of use and examples of the application of geostatistical methods, for the spatial distribution of environmental and anthropogenic phenomena analysis.

Learning purpose: Mastering geostatistical methods in the process of phenomena of a continuous and discontinuous nature imaging. Understanding the methods of describing spatial continuity and principles of using statistical dependencies to study spatial phenomena.

On completion of the study programme the graduate will gain:

Knowledge: Has general knowledge covering key issues of geostatistic.

Skills: Is able to use theoretical knowledge in practical modelling.

Social Competencies: Can interact and work in groups, can organize and coordinate geostatistical modeling.

Basic literature:
1) Krivoruchko, K., Spatial Statistical Data Analysis for GIS Users Esri Pres, Dvdr edition, ArcGIS, 2011,
2) Hengel, T., A Practical Guide to Geostatistical Mapping of Environmental Variables, Office for Official Publications of the European Communities, Italy, 2007.
Supplementary literature:
1) Tobler, W., A Computer Model Simulating Urban Growth in Detroit Region., t. 46 (2), Economic Geography, 1970,
2) CRESSIE N.A. C., Statistics for spatial data., T., John Wiley & Sons, 1993.

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 45

Student's independent work: 5