Syllabus of the doctoral examination course

STUDY PROGRAM: PHYSICAL GEOGRAPHY, GEOECOLOGY AND GEOINFORMATICS

Geomorphometry

1) Definition and scope of geomorphometry

- Definition of geomorphometry and its position within different morphometric approaches

- Development of geomorphometry – geomorphometric schools

- Main topics of contemporary geomorphometry

- Role of geomorphometry in geomorphological theory

2) Digital models in geomorphometry

- Main types of digital models used in geomorphometry (DEM, DTM, DSM)

- Data sources for digital models

- Data formats and networks used

- Interpolation methods

- Scale and generalization

- Applications of digital models in geomorphometry

3) Geomorphometric characteristics

- Classification of geomorphometric characteristics

- Definition and calculation of geomorphometric characteristics

- Use and interpretation of geomorphometric characteristics

- Geomorphometric characteristics in time and space

4) Geomorphometry and land surface segmentation

- Fields and objects in terrain analysis (differences, complementarity, compatibility)

- Statistical and analytical approaches

- Different types of segmentation algorithms

- Segmentation at different scales

- Use and interpretation of segmentation results (with emphasis on GmIS)

Recommended literature:

REUTER, H. I.,GROHMANN, C.H. & LECOURS, V. (eds.) 2026. Geomorphometry: concepts, software, applications. *2nd edition*. Amsterdam: Elsevier.

KRCHO, J. 2001. *Modelling of Georelief and its Geometrical Structure Using DTM: Positional and Numerical Accuracy*. Bratislava: Q 111.

MINÁR, J., DRĂGUŢ, L., EVANS, I.S., FECISKANIN, R., GALLAY, M., JENČO, M. & POPOV, A. 2024. Physical geomorphometry for elementary land surface segmentation and digital geomorphological mapping. Earth Sci. Rev. 248, 104631. https://doi.org/10.1016/j.earscirev.2023.104631