

# Geoinformatics

## Purpose of education:

### a) knowledge

- Comprehensive knowledge of the principles, methods and procedures for the design, development and operation of geoinformatics, in particular in the following areas: operating systems and database management, design and development of web-based geoinformatics tools and services, geoinformatics-related programming principles, geospatial application development.

- Knowledge of the specific tools of the field of cartography and geoinformatics, the mathematical and cartographic principles of editing maps for different purposes, the ability to apply survey procedures, representational solutions and various reproduction technologies.

- Ability to create maps and geoinformatics systems that can be used by economic sectors or clients in the desired field.

### b) abilities

- Ability to interpret and formalise complex professional problems in the field of cartography and geoinformatics, to identify the necessary theoretical and practical background and to solve the problem. Ability to provide consultancy, problem-solving, design, development, operation and management of cartographic and geoinformatics systems, decision support systems and expert systems.

- Ability to interpret, plan, organise, manage and control processes in the field of cartography and geoinformatics.

- Ability to learn and apply new problem-solving methods and procedures in the field.

### c) attitude

- It monitors professional and technological developments in the field of cartography and geoinformatics and the opportunities that will enable it to work in the public sector, in various companies or to set up and run its own business.

- Shares his/her own knowledge and values the dissemination of professional results in cartography and geoinformatics.

- It is committed to meeting and enforcing quality standards (accuracy, commitment).

### d) autonomy and responsibility

- Able to work independently in IT, carrying out tasks, thinking through and developing technical issues in a self-directed manner and at a pace.

- Responsible for meeting and enforcing deadlines. Assumes responsibility for his/her own work and that of his/her colleagues working under his/her direction and with him/her (in a project).

- In the case of mission-critical mapping and geoinformatics systems, may be given development and operational responsibility appropriate with his/her professional competences.

## Content of education:

The aim of the course is to overview the most commonly used concepts in the application of GIS and to explain their context. The topics covered during the semester are: vector and raster data systems; topologies and types of geodatabases and an overview of the OGC standard; dimensions and attributes; the relationship between databases and visualisation and geoinformatics modelling; geoinformatics in society, data communication; interpretation of geoinformatics data (principal component analysis, BigData, machine learning, etc.).

**Evaluation system:** oral and/or written exam.

## Literature:

### Obligatory:

- Albert, G.: Tematikus térképek és geoinformatika a földtudományokban. ELTE, Budapest, Hungary, pp. 380., 2017
- Elek, I.: Adatbázisok, térképek, információs rendszerek. ELTE Eötvös kiadó, 2011, 181 p. ISBN 978963312039

### Recommended:

- Karimi, H. A. (Ed.): Big Data: techniques and technologies in geoinformatics. Crc Press.2014

- Egenhofer, M. J., Clarke, K. C., Gao, S., Quesnot, T., Franklin, W. R., Yuan, M., & Coleman, D.: Contributions of GIScience over the past twenty years. Advancing geographic information science: The past and the next twenty years, 9-34. 2016