ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

1000 София
ул. „Сердика“ № 4
http://edu.bas.bg

email: tdc-phd@cu.bas.bg
тел.: 02 987 31 67
02 979 52 60

Basic Information:
Course Title: Introduction to GIS and work with ArcGIS
Lecturer: prof. Stoyan Nedkov
Phone: 0877690207
Email: snedkov@gmail.com
Total Teaching Hours: 30

Annotation (up to 150 words)

The main objective of the course is to give the basics of the Geographic Information Systems (GIS) and skills for working with ArcGIS software. The course participants will gain knowledge on the main features and principles of Geographic Information Systems, data models and structures in GIS, coordinate systems and different tools in ArcGIS. They will also develop skills in data editing in GIS, mapping, use of spatial analysis and modeling within ArcGIS.

Course content (brief description by topics or modules)

Topic 1. Geographic Information Systems – definition, functions, application. GIS as a computer system. Introduction to the ArcGIS interface: basic components, functions, tools and manipulations. 2 hours of lecture, 3 hours of exercises.

Topic 2 Data models and structure in GIS. Data types, geometry and topology of data, digital relief models, attribute data. Data integration and visualization. 2 hours of lecture, 3 hours of exercises.

Topic 3. Coordinate systems. Working with coordinate systems, setting a projection, projection transformations. Registering a scanned map, digitizing relief elements and the hydrographic network, working with data editing tools. 1 hour of lecture, 4 hours of exercises.

Topic 4. Creating and editing data. Creating a shapefile, formatting attribute data. Geodata – structure, types, advantages. Creating geodata. 1 hour of lecture, 4 hours of exercises.

Topic 5. Creating maps using ArcGIS. Working in Layout view. Basic map elements in ArcGIS. Designing the map. Using mapping tools. Exporting finished cartographic products. Developing thematic maps. 1 hour lecture, 4 hours exercises.

Topic 6. Spatial analysis and modeling in ArcGIS. Model and types of models. Analysis and modeling tools in ArcGIS – calculation of spatial parameters, overlay, buffering, generalization, interpolation, spatial statistics, river basin modeling. Features of spatial analysis when working with raster and vector data. Developing a spatial model for assessing the suitability of a given territory. 1 hour lecture, 4 hours exercises.

Teaching and assessment methods
In-person, online or mixed.

Exam in the form of solving a practical problem.

Competencies acquired as a result of training (3–5 points)

Knowledge of the basic principles and features of modern geographic information systems.

Skills for working with the most common GIS software - ArcGIS.

Skills for working with spatial data, map development, georeferencing and elementary spatial analyses.

Literature:

Berry, J. K. (1999). GIS technology in environmental management. Handbook of global environmental policy and administration, 49-80.

Brimicombe, A. (2009). GIS, environmental modeling and engineering. CRC Press.

Hoag Tu, Le et al. GIS Application in Environmental Management: A Review. VNU Journal of Science: Earth and Environmental Sciences, [S.l.], v. 39, n. 2, june 2023. ISSN 2588-1094.

Additional information (optional) (e.g., special requirements, laboratory equipment, prior knowledge)

Provision of a personal laptop.