Tárgy neve: GIS in R

Tárgyfelelős neve: Dr. Magyari Enikő
Tárgyfelelős tudományos fokozata: DSc
Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja:
a, knowledge
- Comprehensive knowledge of the problem-solving principles, methodology and processes of the planning, development and operation processes of the geoinformatics field, especially in the following areas: database management, Big Data data-mining, primary and secondary data collection, Earth observation, spatial and temporal data analysis, modelling and simulation of processes, network analysis, 3-dimensional modelling, geovisualization, geostatistical solutions, web-based geoinformatics services, spatial services development, geoinformatics programming, development of geospatial applications, open source geoinformatics.
- Knowledge of the specific tools of geoinformatics, ability to apply field survey procedures, data management and analysis, and visualization solutions. Knowledge and use of spatial data collection technologies, available databases and spatial information software, as well as open source and commercial geoinformatics software, cloud-based geoinformatics solutions.
b, abilities
- Ability to interpret complex professional problems in the field of geoinformatics, to explore the necessary theoretical and practical background and to solve problems.
- Ability to interpret geographical/spatial phenomena, processes and information, and to plan, organize, manage and control processes in the field of geoinformatics.
- Ability to creatively and methodically process, evaluate, interpret and analyse measurement results and draw conclusions from them.
c, attitude
- Monitors professional and technological developments in the field of geoinformatics and the labour market trends.
- Committed to adhering to and making others adhere to quality requirements.
- Committed to environmentally conscious behaviour in his/her field and laboratory activities.
- Accepts and adheres to the ethical principles of work and organizational culture, especially with regard to the copyright related to geoinformatics.
d, autonomy and responsibility
- Independence regarding the thorough examination and elaboration of professional issues and processes.
- Feels responsible for meeting and making others meet the deadlines. He/she is responsible for his/her work and for his/her co-workers' work in projects.
- With his/her knowledge and skills of geoinformatics, he/she cooperates responsibly with professionals in other fields.

Az oktatás tartalma: The aim of this course is to briefly introduce students to the basics of R programming language and then describe the ability of R, the software widely used by researchers and statisticians to help the work of geographers, cartographers and GIS specialist. During the course, the following four main topics are concerned: (1) GIS data management (raster/vector databases, cooperation with other geospatial software); (2) solving GIS tasks (geometric operations, transformations, interpolations); (3) visualization of geospatial data (map display, additional map symbols, base maps, interactive maps); (4) calculation with spatial descriptive statistics.

A számonkérés és értékelés rendszere: practical course mark based on course work.

Kötelező irodalom:
- W. N. Venables, D. M. Smith, R Core Team: An introduction to R. https://cran.r-project.org/doc/manuals/r-release/R-intro.pdf
- Roger S. Bivand, Edzer J. Pebesma, Virgilio Gómez-Rubio: Applied Spatial Data Analysis with R. http://gis.humboldt.edu/OLM/r/Spatial%20Analysis%20With%20R.pdf

Ajánlott irodalom:

- Barry Rowlingson: Geospatial Data in R And Beyond!
  www.maths.lancs.ac.uk/~rowlings/Teaching/UseR2012/static/talk1.pdf
- Francisco Rodriguez-Sanchez: Spatial data in R: Using R as a GIS. http://pakillo.github.io/R-GIS-tutorial/
- Robin Lovelace, James Cheshire, Rachel Oldroyd és mtsai.: Introduction to visualising spatial data in R. cran.r-project.org/doc/contrib/intro-spatial-rl.pdf