

Tárgy neve: Spatial Databases

Tárgyfelelős neve: Dr. Gede Mátyás

Tárgyfelelős tudományos fokozata: PhD

Tárgyfelelős MAB szerinti akkreditációs státusza: AT

Az oktatás célja:

a, knowledge

- Comprehensive knowledge and understanding of the key relationships and concepts in the field of geoinformatics, in particular in the following areas: geolocation data collection technologies, 2- and 3-dimensional geoinformatics modelling, geovisualization, spatial data infrastructures, geoinformatics programming and application development, vector and raster geoinformatics, digital image processing, web-based geoinformatics solutions, geoinformatics databases, applied geoinformatics systems.

b, abilities

- Ability to collect data independently and organize spatial data into a database, as well as to organize the data with the tools of geoinformatics. Ability to perform operations and models with independently organized databases.

- Ability to create geoinformatics systems to support and assist decision makers.

- Ability to recognize and apply new problem-solving methods and procedures in his/her field and apply what he/she has learnt in a diverse, multidisciplinary environment.

- Ability to use the professional vocabulary of geoinformatics in his/her mother tongue and English.

c, attitude

- Accepts and adheres to the ethical principles of work and organizational culture, especially with regard to the copyright related to geoinformatics

- Committed to adhering to and making others adhere to quality requirements.

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:

Main topics:

Introduction to PostgreSQL (where clauses, simple and aggregating functions join among tables /left, right, inner, outer joins/, subqueries)

Spatial data storing in PostGIS. WKT and WKB format, EWKT. Data conversion functions, handling projections. Spatial indexing. Graphic visualization of spatial data.

Measuring and calculation object sizes (for example: distances, area, perimeter, azimuth, bounding boxes)

Geometry processing: buffer, centroid, convex and concave hull, line simplification, line smoothing.

Creating different types of geometries.

Geoprocessing in PostGIS (difference, intersection, symmetrical difference, union), topological evaluation

Complex geoprocessing in PostGIS

Creating, modifying and deleting spatial databases.

Working with raster data: satellite images and digital elevation models (data storing, georeferencing, data conversion, multi-channel satellite image, raster mathematics)

Developing simple websites visualizing spatial data.

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

Kötelező irodalom:

- PostGIS Documentation: <https://postgis.net/documentation/>
- Nagy G.: Spatial databases online lecture notes 1-6. chapters.
https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO1/index.html
https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO2/index.html
https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO3/index.html

https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO4/index.html
https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO5/index.html
https://regi.tankonyvtar.hu/hu/tartalom/tamop425/0027_SDO6/index.html

Ajánlott irodalom:

- PostgreSQL Documentation: <https://www.postgresql.org/docs/>
- Obe.E Regina: PostGIS in Action. Shelter Island, Manning, 2015. ISBN: 9781935182269