

## Geographic Information Systems (GIS)

Code: MK5GEO1S5TX17-EN

ECTS Credit Points: 5

Evaluation: mid-semester grade

Year, Semester: 1<sup>st</sup> year, 1<sup>st</sup> semester

Its prerequisite(s): -

Further courses are built on it: No

Number of teaching hours/week (lecture + practice): 0 + 4

### Topics:

GIS tasks of the urban planning procedure. Generation of settlement's spatial information, and realization in GIS environment. Common function of the OPENJump, its structure and appearance. Creating vector database, importing vector data from CAD environment, filling database, generating geometrical objects, editing vector data. Loading raster data. Importing external databases. Joining tables. Thematic map implementation. Integrating the interdisciplinary criteria system (according the URGE project) into a working geographical information system. Spatial and statistical queries according to indicators. Presentation of the results of the queries.

Comparing GIS and CAD applications. Review of an Open JUMP project. Spatial data, vector and raster formats. Attributes. The concept of the sample project. Basic indicators of the project. NDVI, URGE criteria. Building geodatabase, processing data. Queries from own GIS project. Criteria aspect GIS operations. Visualization of the results, charts, cartographic presentations. Discussing of the occurring problems.

The goal of the practice is to train the project approach GIS in a most economical way.

### Literature:

Required:

- Paul A. Longley (2005): Geographical information systems and science, ISBN: 047087001X
- CHRISTOPHER B. JONES (1997): Geographical information systems and computer cartography, ISBN: 0582044391.
- [http://www.tankonyvtar.hu/hu/tartalom/tamop425/0027\\_BGD1/index.html](http://www.tankonyvtar.hu/hu/tartalom/tamop425/0027_BGD1/index.html)
- <http://openjump.org>

Recommended:

- GEORGE F. PINDER (2002): Groundwater modelling using geographical information systems, ISBN: 0471084980

### Schedule

#### 1<sup>st</sup> week Registration week

#### 2<sup>nd</sup> week:

**Practice:** Comparing CAM and GIS applications. Various data-sources in GIS. Introduction the OPENJump project.

#### 4<sup>th</sup> week:

**Practice:** Setting of objectives of a GIS project. Converting spatial data. CAM inputs. Loading vector data.

#### 6<sup>th</sup> week:

#### 3<sup>rd</sup> week:

**Practice:** Introduction to OPENJump software. Opening tutorial and sample project tasks. Investigate existing well-working projects.

#### 5<sup>th</sup> week:

**Practice:** Processing vector data. Transform and replicate vector data.

#### 7<sup>th</sup> week:

**Practice:** Editing, converting geometric data. Quality control of vector data. Topological monitoring.

**8<sup>th</sup> week:** 1<sup>st</sup> drawing week

**9<sup>th</sup> week:**

**Practice:** Loading raster data into the GIS project. Transformations, corrections.

**11<sup>th</sup> week:**

**Practice:** Loading attributes, filling attribute tables. Edit view/attributes.

**13<sup>th</sup> week:**

**Practice:** Statistical analyses, indicators, queries. Possibilities of the Sextante modul.

**15<sup>th</sup> week:** 2<sup>nd</sup> drawing week

**Practice:** Automated and semi-automated data sources. Extract data by geometry type. Extract data by attribute.

**10<sup>th</sup> week:**

**Practice:** Extract geometrical data from raster.

**12<sup>th</sup> week:**

**Practice:** Edit schema, styles.

**14<sup>th</sup> week:**

**Practice:** Project presentations, evaluation of the personal project implementation

## Requirements

### A, for a signature:

Participation at practice is compulsory. Students have to attend the practice classes and may not miss more than three times during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Students can't make up a practice class with another group. Attendance at practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practice classes should be made up for at a later date, to be discussed with the tutor. Students are required to bring a USB storage drive to each practice. Active participation is evaluated by the teacher in every class. If a student's behaviour or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

Students have to make a GIS project presentation or essay from an existing or an accomplished/working project. If it is correct the student gets a signature.

### B, for a grade:

The course ends with a practical grade.

During the semester the students have to make an own GIS project, and they have to send all of the project files to the leader of the practice at the end of the semester. According to the basic requirements of a GIS the practice leader evaluate the student's work and offer him/her a practical grade. Evaluating consideration: completeness, integrity, operability, through the viewpoints of the acquainted criteria system.

Students can make up or improve their grades at the last week of the semester.