

Surveying and Topography L

Purpose of education

a) knowledge

- know the types of geodetic measurements, the most commonly used methods and instruments;
- knowledge of the technical content of spatial data obtained by modern geodetic methods, their applicability in the process of creating map databases.
- knowledge of the structure and content of topographic maps and map databases;
- knowledge of the tools and processes of topographic survey and database construction;
- is familiar with the Hungarian state topographic map databases and the possibilities of using state data.

b) abilities

- is able to select the most appropriate geodetic data acquisition method for the given task, based on the technical accuracy requirements of the task;
- be able to evaluate the technical content of spatial data generated by geodetic methods and their incorporation into map databases, and to use spatial data obtained by geodetic methods.
- be able to select the most appropriate state topographic mapping data for the task in hand, depending on the complexity of the task;
- be able to participate in the production of topographic maps and map databases.

c) attitude

- Familiarisation with geodetic survey methods and tools, data acquisition technologies and the acquisition of a map database approach will help to develop the right attitude towards professional cooperation with professionals working with public cartographic data in related fields.
- Open and committed to critical feedback and evaluation based on self-reflection. Adopts and enforces with co-workers ethical principles of work and organizational culture, with particular attention to the copyright environment related to 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 student will learn about the role of surveying and topography in mapmaking and spatial databases. The student will learn the basics of Global Navigation Systems, types of measurements and tools for surveying, and modern field data acquisition and topographic survey methods.

The course gives a general idea of the technologies and tools of topographic survey and database construction. It provides overview information on the state topographic maps and map databases of Hungary, the topographic mapping of the country, the available analogue and digital map series, the usability of state digital topographic map data. It introduces modern digital topographic map database development concepts and projects.

1. Introduction to the concepts of surveying and topography, the term of state topographic data and databases.
2. Geodetic measurements, measuring instruments. Measurement procedures, classical measuring instruments. Modern data acquisition technologies, point cloud.
3. GNSS surveying applications. Systems, measurement technologies, services.
4. Detailed survey. Basics of geodetic surveys.
5. Surveying base map, DAT, cadastral maps.
6. Basics of topographic mapping. Perspective, survey tools, survey techniques.
7. State topographic maps, databases. Historical overview of system maps, databases, their characteristics.

8. Creation of digital topographic map databases. Theoretical and technical basis, methods of implementation.
9. Restoration of topographic maps and databases
10. Quality control of survey works. Quality control system, documentation. State acceptance procedure. Accuracy of topographic maps, databases.
12. Archiving of topographic maps.
- 13-14 Introduction to modern measuring instruments and practical demonstration of the process and technology of producing state topographic map databases and database-based map production in a visit to a military cartographic production facility

Evaluation system: oral or written exam

Literature:

Obligatory:

- Csepregi Szabolcs–Gyenes Róbert–Tarsoly Péter: GEODÉZIA I. NyME, Székesfehérvár, 2013 (digitális jegyzet)
- Dr. Tarsoly Péter: GEODÉZIA II. NyME, Székesfehérvár, 2013 (digitális jegyzet)
- Mélykúti Gábor: Topográfia, NyME, Geoinformatikai Kar 2010, digitális jegyzet
- Mélykúti Gábor: Topográfiai adatbázisok, BMEEOFTASJ3 segédlet a BME Építőmérnöki Kar hallgatói részére, BME 2007. digitális jegyzet
- 2/2014. (I. 10.) VM rendelet az állami topográfiai térképi adatbázisról
- 15/2013. (III. 11.) VM rendelet a térképészetért felelős miniszter felelősségi körébe tartozó állami alapadatok és térképi adatbázisok vonatkoztatási és vetületi rendszeréről, alapadat-tartalmáról, létrehozásának, felújításának, kezelésének és fenntartásának módjáról, és az állami átvétel rendjéről
- 39/2014. (XII. 18.) FM rendelet az állami alapadatok adatbázisainak selejtezési és archiválási rendjéről, valamint a földügyi és távérzékelési levéltárról

Recommended:

- Bácsatyai László: Geodézia erdő és környezetmérnököknek, Geomatika Közlemények VI. MTA GGKI, Sopron, 2002
- Kállai Attila: Topográfia (Egyetemi jegyzet) 1999. Zrínyi Miklós Nemzetvédelmi Egyetem, pp. 243