**ETG5130** Topographic surveying

ECTS credits**: 6 EAP**

assessment form**: exam**

Course aims

Review topographical surveying as an essential part of engineering projects. Familiarizing with requirements of topographical surveying and as-built surveying of technical utilities (such as power and communication cables, sewage, water etc). Familiarizing with symbols of digital topographical maps and their use. Compilation of the 3D terrain model. Disseminating skills on all the stages of the topographical surveys, including reporting.

**The content of the course:**

Applications of Topographical Surveying. Estonian engineering geodesy regulations. Fundamentals and concepts of the surveys. Methods, requirements and data processing of the geodetic control. Methods and accuracy requirements applied for surveying of relief, buildings and landscape elements. Requirements for Topographical Surveying.
Fundamentals of as-built surveying of technical utilities (such as power and communication cables, sewage, water etc). Symbols of digital topographical maps and their use. Compilation of the 3D terrain model. Generating a complete survey report.

Home assignments:
Calculating of geodetic control: traverses and trigonometric levelling.

Practical assignments:
1. Reconnaissance of a survey site
2. Determination of the optimum locations of the geodetic control points and their establishment
3. Traverse measurements (and RTK GPS if available)
4. Trigonometric levelling of the control points (simultaneously with traversing)
5. Measurements on a survey site
6. Computer drawing of the site-plan
7. 3D digital terrain modelling
8. Acquiring and recording the data on technical utilities (such as manholes etc) and other appendices of the survey report.
8. Creating the final technical report

**Learning outcomes (basic level):**

A successful student :

1. Performs the preliminary works and establishes the geodetic control network on the surveying site
2. Knows the requirements of Topographical Surveying;
3. Knows the symbols of digital topographical maps and uses them in practice.
4. Performs the measurements in a surveying site, draws the site-map and assembles all the required parts and appendices of the topographical survey report.

| **Learning outcomes** | **Grading method** | **Evaluation criteria** |
|---|---|---|
| 1. Performs the preliminary works and establishes the geodetic control network on the surveying site | Field exercises in small teams (surveying), followed by individual data processing in the computer class, adequate assessment of the follow-on home assignment | Pass/fail assessment<br>*The threshold corresponds to the basic level*<br>Active participation in the tem work, correctness of the data processing and home assignment. |
| 2. Knows the requirements of Topographical Surveying | Evaluation of the home assignment | Pass/fail assessment<br>*The threshold corresponds to the basic level*<br>Presence in ¾ of classes, active participation, correctness of the topical home assignment. |
| 3. Knows the symbols of digital topographical maps and uses them in practice | Adequate assessment of the computer exercises | Pass/fail assessment<br>*The threshold corresponds to the basic level*<br>Presence in ¾ of classes, active participation, correctness of the topical class assignment. |
| 4. Performs the measurements in a surveying site, draws the site-map and assembles all the required parts and appendices of the topographical survey report. | Field exercises in small teams (surveying), followed by individual data processing in the computer class, adequate assessment of the follow-on home assignment | Pass/fail assessment<br>*The threshold corresponds to the basic level*<br>Correctness of the topographical surveying map and 3D terrain model. Explanation of the workflow. |
| | **Preconditions of the assessment** | Passing of the home and practical assignments is the prerequisite. Presence in ¾ of the classes. |
| | **Formation of final grade** | The grade (0 to 5) of the exam depends on the adequacy of the answers.<br>The examination result forms 100% of the overall grade |