**Department of Geodesy and Surveying**

**Automated Survey System**

**Detailed course program, 2025 Spring semester**

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| **week** | **date** | **lecturer** | **topic** |
| 1. | 13 February |  | Python and Colab basics. Command prompt. Colab, Debugger (idle), GitHub, StackExchange, ChatGPT. Python modules. |
| 2. | 20 February |  | Python data types, array operations.Load text files, simple calculations, statistics, and plots. |
|  | 20 February |  | Reading and writing dxf files.  |
| 3. | 27 February |  | Section of a point cloud. Using CloudCompare graphical user interface (GUI) and command-line interface (CLI). |
| 4. | 6 March |  | Loading and manipulating point clouds with Python programs. Generate sections. Save as coordinate list, image and to dxf files. **1st project definition**  |
|  | 6 March |  | Point cloud segmentation, application of artificial intelligence. |
| 5. | 13 March |  | Total station programming. Terminal emulator. |
| 6. | 20 March |  | Introduction to ULYXES. |
|  | 20 March |  | Applications and development of ULYXES.  |
| 7. | 27 March |  | OEM GNSS receivers. |
| 8. | 3 April |  | Processing raw GNSS measurements with RTKLIB. CLI and GUI. **Submission of 1st project**  |
|  | 3 April |  | Digital image processing. Using OpenCV and Python.  |
| 9. | 10 April |  | Movement detection using digital images.**2nd project definition** |
| 10. | 17 April |  | Spring holiday |
|  | 17 April |  | Spring holiday |
| 11. | 24 April |  | Spring holiday |
| 12. | 1 May |  | National holiday |
|  | 1 May |  | National holiday |
| 13. | 8 May |  | Measurements on “Erzsébet híd”. |
| 14. | 15 May |  | Processing of bridge measurements 1. (total station, GNSS) |
|  | 15 May |  | Processing of bridge measurements 2. (video and sound evaluation) |
| 15. | 22 May |  | **Submission of 2nd project.** Presentations, evaluation. |