

## Geodesy and Topography

- The subject of geodesy. Positioning, units of measure.
- Locating points. Gravitational space, surfaces, elevation. Surfaces replacing the Earth. Projections, distortions. Sheet systems.
- Measurements, geodetic problems on plane. Measurement errors, accuracy, propagation of error.
- Point system of surveying. Networks. Marking points on the terrain.
- Geodetic instruments. Basics of optics.
- Theodolites.
- Horizontal measurement of angle. Methods of measuring. Orientation tools. Regular errors of theodolite.
- Positioning of points. Methods, calculations, building networks.
- Measuring distances. Optical tools of telemetry. Trigonometry. Measurement errors.
- Measuring elevations. Methods of determining elevation differences. Trigonometric, geometric and physical levelling. Levelling by satellites.
- Global positioning in geodesy. Types of GNSS (GPS, GLONAS, GALILEO, local navigation systems). Measurement methods and errors. GNSS services (permanent networks, GPRS).
- Detailed surveying. Instruments (Cartesian system, polar system, use of GPS, elevations, longitudinal and cross profiles, point clouds of mobile mapping systems).
- Cartographic visualization methods. Analogue and digital maps. Cartographic data models. Cadastral base maps and their content. Digital base maps. Standards and regulations.
- Surveying public utilities. Public utility maps.

### Literature:

B. Hofmann-Wellenhof and H. Moritz, Physical Geodesy, Springer-Verlag Wien, 2005.  
Lu, Zhiping, Qu, Yunying, Qiao, Shubo: Geodesy, Introduction to Geodetic Datum and Geodetic Systems, Springer, 2014.  
Wolfgang Torge, Jürgen Müller: Geodesy  
Walter de Gruyter, 2012

### Suggested literature:

Günter Seeber: Satellite Geodesy  
Walter de Gruyter, 2003  
Peter J.G. Teunissen, Alfred Kleusberg: GPS for Geodesy  
Springer Science & Business Media, 2012