# Surveying II. (BSc)

# Spring semester, 2023/24

# Detailed course plan

## Lectures (Thursday 10-12)

week	date	topic
1	15 February	Electrooptical distance measurements. Processing distance
		measurements. Measuring control points.
2	22 February	Tacheometry. Total stations.
3	29 February	Setting out with polar coordinates and offsets. Setting out software of
		total stations. Radial and transition curves. Setting out curves.
4	7 March	3D coordinate determination with Global Navigation Satellite
		Systems (GNSS). Constellations. Principle of positioning. Observations.
		Accuracy.
5	14 March	GNSS error sources. Methods (standalone, differential, static, real-time
		kinematic) and their applications. GNSS infrastructure. Transformation
		into national reference system.
6	21 March	Random error. The mean error and the weight. Propagation of
		mean error.
7	11 April	Adjustment of repeated observations of a single quantity
8	18 April	Construction tolerances. Fundamentals of geometrical quality
		control of construction. Checking of walls.
		Planning of setting out.
		Public utilities and their registry. Detecting and mapping underground
		pipes.
9	25 April	Movement detection. Settlement monitoring.
		Surveying of buildings.
10	2 May	Point cloud techniques and their applications. Photogrammetry, UAV,
		laser scanning.
11	9 May	Underground lines Determine the position of. Public utility registration.
		e-public utility planning support.
12	16 May	(TBD)
13	23 May	(TBD)

## Practicals (Thursday)

week	Date	topic
1	15 Ferbuary	Traversing, traverse types. Calculation of free traverse.
2	22 February	Calculation of the linked (closed line) traverse
3	29 February	Calculation of a trigonometrical line
4	7 March	1 <sup>st</sup> mid-term test: Computation of the closed line traverse
5	14 March	Fundamentals of mapping. Reading maps. Height representation. Digital
		maps.
6	21 March	Data acquisition from maps. Methods of area calculation. On-line maps
		and geoinformatic systems. Maps in civil engineering practice.
7	11 April	Large scale digital mapping with digitizing analogue maps.
8	18 April	Computational adjustment of repeated observation of a single
		quantity.
9	25 April	Computational exercises for the propagation of mean error.
10	2 May	Levelling in multi-storey buildings. Transferring height systems between
		various floors.
11	9 May	2 <sup>nd</sup> mid-term test: Mapping, computational adjustments and error
		theory
12	16 May	Measurement of the height of buildings using trigonometric
		heighting.
13	23 May	GNSS practical: absolute positioning using code-pbservations, DGPS, RTK.
		Accuracy measures.

## Practicals (Friday)

week	date	topic
1	16 Ferbuary	Traversing, traverse types. Calculation of free traverse.
2	23 February	Calculation of the linked (closed line) traverse
3	1 March	Calculation of a trigonometrical line
4	8 March	1 <sup>st</sup> mid-term test: Computation of the closed line traverse
5	22 March	Fundamentals of mapping. Reading maps. Height representation. Digital
		maps.
6-7	19 April	Data acquisition from maps. Methods of area calculation. On-line maps and geoinformatic systems. Maps in civil engineering practice. / Large scale digital mapping with digitizing analogue maps.
8	26 April	Computational adjustment of repeated observation of a single quantity.
9	3 May	Computational exercises for the propagation of mean error.
10	10 May	Levelling in multi-storey buildings. Transferring height systems between various floors.
11	(out of schedule)	2 <sup>nd</sup> mid-term test: Mapping, computational adjustments and error theory
12	17 May	Measurement of the height of buildings using trigonometric heighting.
13	24 May	GNSS practical: absolute positioning using code-pbservations, DGPS, RTK. Accuracy measures.

Dates of the retakes of the midterm tests:

2024.03.21 at 16:15 - retake of the 1st midterm test (Computation of the closed line traverse) 2024.05.27 at 12:15 - retake of the 2nd midterm test (Mapping, computational adjustments

and error theory)

2024.05.30 at 12:15 - re-retake of the 1st or the 2nd midterm test