

Surveying II. (BSc)

Spring semester, 2024/25

Detailed course plan

SCHEDULE OF THE SEMESTER:

Lectures (Thursday 10-12)

week	date	topic
1	13 February	Electrooptical distance measurements. Processing distance measurements. Measuring control points.
2	20 February	Tacheometry. Total stations.
3	27 February	Setting out with polar coordinates and offsets. Setting out software of total stations. Radial and transition curves. Setting out curves.
4	6 March	3D coordinate determination with Global Navigation Satellite Systems (GNSS). Constellations. Principle of positioning. Observations. Accuracy.
5	13 March	GNSS error sources. Methods (standalone, differential, static, real-time kinematic) and their applications. GNSS infrastructure. Transformation into national reference system.
6	20 March	Random error. The mean error and the weight. Propagation of mean error.
7	27 March	Adjustment of repeated observations of a single quantity
8	3 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	10 April	Movement detection. Settlement monitoring. Surveying of buildings.
10	8 May	Point cloud techniques and their applications. Photogrammetry, UAV, laser scanning.
11	15 May	Underground lines Determine the position of. Public utility registration. e-public utility planning support.
12	22 May	(TBD)

Practicals (Thursday)

week	Date	topic
1	13 February	Traversing, traverse types. Calculation of free traverse.
2	20 February	Calculation of the linked (closed line) traverse
3	27 February	Calculation of a trigonometrical line
4	6 March	1st mid-term test: Computation of the closed line traverse
5	13 March	Fundamentals of mapping. Reading maps. Height representation. Digital maps.
6	20 March	Data acquisition from maps. Methods of area calculation. On-line maps and geoinformatic systems. Maps in civil engineering practice.
7	27 March	Large scale digital mapping with digitizing analogue maps.
8	3 April	Computational adjustment of repeated observation of a single quantity.
	8 April	16.15-17:00: short-test (online) from the 5-7 practicals
9	10 April	Computational exercises for the propagation of mean error.
10	15 May	Levelling in multi-storey buildings. Transferring height systems between various floors.
11	8 May	2nd mid-term test: Mapping, computational adjustments and error theory
12	22 May	Measurement of the height of buildings using trigonometric heighting.
13	22 May	GNSS practical: absolute positioning using code-observations, DGPS, RTK. Accuracy measures.

Practicals (Friday)

week	date	topic
1	14 February	Traversing, traverse types. Calculation of free traverse.
2	21 February	Calculation of the linked (closed line) traverse
3	28 February	Calculation of a trigonometrical line
4	7 March	1st 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	28 March	Large scale digital mapping with digitizing analogue maps.
	8 April	16.15-17:00: short-test (online) from the 5-7 practicals
8	11 April	Computational adjustment of repeated observation of a single quantity.
9	9 May	Computational exercises for the propagation of mean error.
10	17 May (Saturday!)	Levelling in multi-storey buildings. Transferring height systems between various floors.
11	16 May	2nd mid-term test: Mapping, computational adjustments and error theory
12	23 May	Measurement of the height of buildings using trigonometric heighting.
13	23 May	GNSS practical: absolute positioning using code-observations, DGPS, RTK. Accuracy measures.

Dates of the retakes of the midterm tests:

- 2025.03.20 at 16:15 - **retake of the 1st midterm test** (Computation of the closed line traverse)
- 2025.05.26 at 10:15 - **retake of the 2nd midterm test** (Mapping, computational adjustments and error theory)
- 2025.05.29 at 12:15 - **re-retake of the 1st or the 2nd midterm tests**

ADDITIONAL REMARKS:

How the grade is determined?

1. Results of the mid-semester tests:

Short-test	max. 10 point (no expected minimal point)
1st mid.term test	max. 30 point (minimum 15 points should be achieved)
2nd mid.term test	max. 30 point (minimum 15 points should be achieved)

Total: max. 70 point (minimum 35 points should be achieved)

2. The mid-semester mark:

fail (1)	0	-	34	point
pass (2)	35	-	42	point
satisfactory (3)	43	-	52	point
good (4)	53	-	61	point
excellent (5)	62	-	70	point

3. Final mark:

The theoretical part will be assessed orally. Three questions are drawn in the oral exam.

The mark for the exam is the arithmetic mean of the marks obtained for each question (only if all has been answered to at least pass level) and the mid-semester mark, but the mark is fail (1) if the oral exam is failed.

Budapest, 2025. január 28.

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