Assessment criteria of subject ADVANCED GEODESY – ETG5150

LEARNING OUTCOME	ASSESSMENT METHOD	ASSESSMENT CRITERIA
1. Describes subdivisions of theoretical geodesy, figure of the Earth, relationships of it's dimensions, coordinate systems.	**Structured written test, part B1. Elaborated short answers to questions**	**Marking** **"1" ("sufficient")** *Insignificant shortages by completing of basic criteria are presented* **"2" ("satisfactory")** *Threshold criteria* Knows the 3 main parts of the subject and the subdivisions of one of them; Knows the 2 main models of the Earth and the subdivisions of one of them; Knows and describes geodetic coordinates
2. Describes fundamentals of precise angle and distance measurements, distinguishes methods of connecting the networks, practises measurements of them	**Structured written test, part B1. Elaborated short answers to questions**	**Marking** **"1" ("sufficient")** *Insignificant shortages by completing of basic criteria are presented* **"2" ("satisfactory")** *Threshold criteria* Can draw the open and the closed traverse, knows their advantages and faults and the conceptions – diagonal of the traverse and the nodal point; Knows the point of the traverse with the largest error before adjustment and after adjustment and their probable relation; Knows 5 main rules of the high accuracy angle measurement; Knows the main sources of the traversing angle measurements' errors; Knows, which axes of the theodolite must be perpendicular to one another; Knows, which instrumental errors of the theodolite eliminate in surveying with the two faces; Knows, which corrections the total station takes into account automatically and which semi-automatically by means of the initial data; Knows the conception of the dangerous circumference (circular error) of the resection and can establish if the point in question is too close to the dangerous circumference; Knows the conception of the intersection; Knows the value of the minimum intersection angle.
3. Practises	**Structured**	**Marking**

traversing initial data processing and estimates the accuracy of the measurements 5. Practises high precision levelling and it's initial data processing	**written test by means of partial auxiliary materials, part A. Computation of written problems**	**"1" ("sufficient")** *insignificant shortages by completing of basic criteria are presented* **"2" ("satisfactory")** *Threshold criteria* Can select the appropriate equations according to conditions of the task; Can (when needed) reduce the coordinates to the central meridian and point of origin; Can (when needed) compose the right oriented scheme of the angle by coordinates of the sides' endpoints; Can find the mean height of the two benchmarks by height one of them and the elevation between them; Can find the values of the Bouguer anomalies from the corresponding chart. Uses the correct units.
4. Describes the fundamentals of establishing of the national vertical control, requirements to the equipment and sources of the errors. 5. Practises high precision levelling and it's initial data processing	**Structured written test, part B1. Elaborated short answers to questions**	**Marking** **"1" ("sufficient")** *Insignificant shortages by completing of basic criteria are presented* **"2" ("satisfactory")** *Threshold criteria* Knows the main types of the benchmarks and their usage; Knows recommendations to location and soil of the benchmark; Knows the method of connecting the line levelling of the I and II classes with existing lines; Knows the main parameters for evaluation of the levels for exploitation in high-precision levelling; Knows the factors, have effect on accuracy of the digital levels and which part of the field of view have to filled with bar code (levels of Leica and Trimble-Zeiss)); Knows personal, instrumental and external (environmental) errors of levelling by means of the tilting level. Knows the mean tests of the invar-rod; Lists 3 types of the geoid (depending on the method of the determination and calls out each method (group of the methods); Knows the concepts of the height anomaly, the geoid height and the

		reference plane for normal height, orthometric height and geodetic height; Knows the computation of the elevation's correction due to the difference of the pair of rods from their nominal length; Knows the components of the correction due to the difference of rods' temperature
1. Describes subdivisions of theoretical geodesy, figure of the Earth, relationships of it's dimensions, coordinate systems	**Structured written test, part B2. Elaborated short answers to questions**	**"3" ("good") – "5" ("excellent")** *In addition to criterions of part B1* Knows the principles, advantages and faults of the trilateration; Knows the triangulation's principles, mean elements, typical figures and nets; Knows points and azimuths of Laplace and their application;
2. Describes fundamentals of precise angle and distance measurements, distinguishes methods of tying the networks, practises measurements of them	**Structured written test, part B2. Elaborated short answers to questions**	**"3" ("good") – "5" ("excellent")** *In addition to criterions of part B1* Knows the cases, when the collimation error and inclination error do not influence the results of the angle measurements; Knows the Struve's rule about values of initial angle readings in different sets and rule about closing the horizon in different faces; Knows the inclination error of the theodolite; Calls out the influence of the inclination of theodolite vertical axes and explains, why it does not eliminate in two faces; Calls out the collimation error of the theodolite; Knows the reasons of the horizontal refraction, methods which minimize its influence on results the angle measurements and approximate mathematical dependence between refraction and the sighting distance; Knows the advantages and faults of the fixing the traverse points on the walls and the types of such fixing; Can draw the system of the three traversing points on the wall and list the measurable elements
4. Describes the fundamentals of establishing of the national vertical control,	**Structured written test, part B2. Elaborated short answers to questions**	**"3" ("good") – "5" ("excellent")** *In addition to criterions of part B1* Knows the checks of the high precision tilt level, which have to execute before the field period; which check eliminates

requirements to the equipment and sources of the errors. 5. Practises high precision levelling and it's initial data processing		and which is added for level with compensator; Knows, the kinds of gravity acceleration, which function is the orthometric height, normal height; Knows gravity anomaly, by means of which is find the anomaly in the open air;
	Preconditions of the assessment	Submitting and assessment 5 homework timely; Submitting the correct report of the 4 laboratory works (group work) in time
	Development of the mark	The examination establishes the overall final mark The examination-paper divides by three parts: Part A –numerical solution of the exercises; Part B1 – threshold criteria of the textual answer; Part B2 – the complementary criteria of the textual answer. Solving of the each task in the part A correspondingly to the threshold criteria and without miscalculations gives the maximum number of points which will be noted on the task paper. Each miscalculation decreases the possible number of the points by 3. Solving of the each task without miscalculations and with insignificant imperfections by completing of basic criteria gives 51% of the maximum number of points. Each miscalculation decreases the possible number of points by 3. Questions of the part B1 have to answer completely, only the insignificant shortages are permitted. The complete answer of this part gives 30 points, by occurrence of the insignificant shortages, the part gives 24 points and by occurrence significant shortages – 0 points. Each of the four questions of the part B2 gives, depending on quality of the

		answer from 0 to 5 points. If the question is strucrured, the correct answer of the section gives points reciprocally of number of the joints. The answer with insignificant shortages gives half of the possible points. The examination is passed if both the tasks and textual questions give either separately 51% of points as minimum. If the condition is executed, the points are added up and it is find the mark. If the sum of points is: 51 – 60, the mark is “1”; 61 – 70, the mark is “2”, 71 – 80, the mark is “3”, 81 – 90, the mark is “4”, 91 and more, the mark is “5”.