Course Unit Descriptor

Study Programme: Geodesy

Course Unit Title: Geodetic metrology

Course Unit Code: GE16

Name of Lecturer(s): Associate Professor Siniša Delčev

Type and Level of Studies: Basic academic studies

Course Status (compulsory/elective): Compulsory

Semester (winter/summer): Winter

Language of instruction: English

Mode of course unit delivery (face-to-face/distance learning): Face-to-face

Number of ECTS Allocated: 5

Prerequisites: None

Course Aims:

Students were introduced with classification of metrology, system of units and tasks and method of the geodetic metrology.

Learning Outcomes:

Students were introduced with the analysis of measuring methods in general and with the analysis of measuring methods of the measurand used in geodesy. Students were trained to be able to use the analysis of measuring methods in further calculations with different types of geodetic problems.

Syllabus:

Theory

1. week The subject, objectives and tasks of geodetic metrology. The principles of metrology.
2. week International system of units and measures.
3. week Analysis of the methods for measuring of horizontal angles - the determination of certain sources of error in the measurement, classification errors toward the character.
4. week Analysis of the methods for measuring of horizontal angles - the determination of certain sources of error in the measurement, classification errors toward the character.
5. week Terms used to evaluate the accuracy of measurement of horizontal angles, accuracy requirements.
6. week Analysis of the methods for measurement of height differences - the determination of certain sources of error in the measurement, classification errors toward the character.
7. week I colloquium.
8. week Analysis of the methods for measurement of height differences - the determination of certain sources of error in the measurement, classification errors toward the character.
9. week Terms used to evaluate the accuracy of measurement of height differences, the conditions of accuracy.
10. week Analysis the methods of optical and mechanical measuring the length - determination of certain sources of error in the measurement, classification errors toward the character. Terms used to evaluate the accuracy of measurement accuracy requirements.
11. week Analysis methods of measuring the length of the electro-optical distance meters - determination of certain sources of error in the measurement, classification errors toward the character. Terms used to evaluate the accuracy of measurement accuracy requirements.

12. week Analysis methods of measuring the length of the electro-optical distance meters - determination of certain sources of error in the measurement, classification errors toward the character. Terms used to evaluate the accuracy of measurement accuracy requirements.

13. week Metrological assurance of determining the vector by using GPS technology - analysis of measuring methods, the determination of certain sources of error in the measurement, classification errors toward the character expressions for estimation of accuracy of measurement accuracy requirements.

14. week Metrological assurance of measuring of gravity acceleration - analysis of measuring methods, the determination of certain sources of error in the measurement, classification errors toward the character expressions for estimation of accuracy of measurement accuracy requirements.

15. week II colloquium.

Practice

Introduction with instruments for measuring and determination of individual sources of error.

Required Reading:

1. S. Delčev: Geodetska metrologija, Akademska misao, Beograd, ISBN 978-86-7466-640-1, 2016.

Weekly Contact Hours:	**Lectures:** 30	**Practical work:** 30

Teaching Methods:

Lectures, exercises, colloquiums, consultations.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points
Active class participation	5	written exam	(40)
Practical work	5	oral exam	50
Preliminary exam(s)	40	…….	

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.