SYLLABUS

1. Course title:

SURVEY AND MINING MEASUREMENTS

2. Code:

LRUDGRM

3. Cycle of study:

1

4. ECTS credits:

5

5. Type of course:

Mandatory

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester(s):

1 4

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)	
9.1. Lectures	3			Classes:	56,25
9.2. Seminars	0			Individual work:	70,65
9.3. Laboratory / Practice classes	2			In total:	126,90

10. Faculty:

Mining, Geology and Civil Engineering

11. Department/study program:

Mining Engineering

12. Lecturer:

PhD Adila Nurić Full Professor

13. Course aims:

Familiarizing students with the fundamentals of geodesy, mining measurements, and their application in mining.
• Acquiring basic theoretical and practical knowledge of geodetic methods for collecting geospatial data, with a special focus on the specifics of data collection for mining activities.

• Introduction to instruments and methods for measuring basic geometric quantities, as well as the processing of measurement results to obtain the necessary geospatial information of appropriate quality and reliability.
• Acquiring basic knowledge about new technologies and methods for collecting geospatial information.
• Acquiring basic knowledge about methods for representing geospatial information.
• Acquiring basic knowledge about defining spatiotemporal processes influenced by mining operations (surface displacement in the mining zone).

14. Learning outcomes:

At the end of the semester/course, successful students who have continuously fulfilled their obligations throughout the entire teaching period will be able to:
- Independently perform measurements of basic geometric quantities related to the space of mining activities.
- Create overview graphical representations of spatial relationships in the technological process of surface and underground mineral extraction.
- Process measurement data to obtain the necessary geospatial information and present it in graphical form.
- Mark the basic geometric elements of a given mining project.

15. Course content:

Introduction, definitions, subject, and tasks of geodesy and mining measurements. The shape of the Earth and its approximations, reference surfaces for horizontal and vertical measurements. Representation of the Earth's surface in the plane of a cartographic projection, Gauss-Krüger projection, national coordinate system, UTM projection. Coordinates and coordinate systems, reference coordinate systems. Geometric basis for measurements on the surface and underground, point networks for horizontal and vertical measurements. Geoinformatics in mining. Measurement and measurement errors, basic concepts of adjustment calculations. Measuring geometric quantities, units of measurement, measuring angles and lengths, instruments and accessories, measurement methods. Determining heights, determining heights underground. Determining point coordinates. Surveying terrain and mining operations, survey methods, and instruments. Remote sensing. Global positioning system (GPS). Creating plans, vertical representation of terrain on plans. Digital terrain model, determining volumes of excavated material. Plans and maps in digital form. Raster and vector representation of spatial data. Visualization of spatial data. Mining graphic documentation, geographic information systems in mining. Linking underground polygonal networks with the geometric base on the surface. Theodolite, inertial measuring systems. Transferring projected mining objects to the field. The impact of excavation on the surface; basic concepts and parameters of the displacement process.

16. Learning methods:

Lectures, exercises, consultations; lectures and exercises are interactive and practical in nature.
- Through practical work, students will become familiar with geodetic instruments and methods for measuring basic geometric quantities, as well as processing and presenting measurement results in order to obtain the necessary geospatial information of appropriate quality and reliability.

17. Assessment methods:

The methods of assessing student knowledge include:
1. Tests from the theoretical part of the material
2. Tests from tasks
3. Tasks from practical work
4. Final exam

18. Assessment components:

Grading and Evaluation System
- Attendance at lectures: 3 points
- Attendance at exercises: 3 points
- Activity: 4 points
- Field/lab exercise tasks: 10 points
- Test I: 15 points
- Test II: 15 points
- Pre-exam obligations: 50 points
- Final exam: 50 points
- Total points: 100

The final success of the student, after all prescribed forms of knowledge assessment, is evaluated and graded using a system comparable to the ECTS grading scale as follows:
- 10 (A) – Outstanding performance with no or minor errors, 95-100 points
- 9 (B) – Above average, with some errors, 85-94 points
- 8 (C) – Average, with noticeable errors, 75-84 points
- 7 (D) – Generally good, but with significant shortcomings, 65-74 points
- 6 (E) – Meets the minimum criteria, 54-64 points
- 5 (F, FX) – Does not meet the minimum criteria, less than 54 points

19. Mandatory reading list:

R. Čeliković: Rudarska mjerenja, Tuzla 2005.,
M. Patarić: Rudarska mjerenja I, Beograd 1990.
M. Patarić, A. Stojanović: Pomeranje potkopanog terena i zaštita objekata od rudarskih radova, Beograd 1994.
I. Aleksić, K. Vračarić: Praktična geodezija, Beograd 2007.
S. Pašalić: Inženjerska geodezija, Sarajevo 1995.
N.Vušović: Rudarska mjerenja, Bor 2000.

20. Additional reading list:

21. Web sources:

22. Applicable from the academic year:

2025/26

23. Adopted in the Faculty/Academy session: