SYLLABUS

1. Course title:

GEOENVIRONMENTAL ENGINEERING

2. Code:

LRUDGOKI

3. Cycle of study:

1

4. ECTS credits:

4

5. Type of course:

Elective

6. Prerequisites:

No

7. Class restrictions:

No

8. Duration / semester(s):

1 2

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)	
9.1. Lectures	2		Classes:	22,5	
9.2. Seminars	0		Individual work:	80,92	
9.3. Laboratory / Practice classes	0		In total:	103,42	

10. Faculty:

Mining, Geology and Civil Engineering

11. Department/study program:

Mining Engineering

12. Lecturer:

PhD Zvjezdan Karadžin Associate Professor

13. Course aims:

Course Objectives:

- To impart knowledge and gained experience related to geo-environmental engineering, with a focus on the mining sector in our country.

- **To enhance students' communication skills in both written and verbal form.**
- **To improve students' work habits and encourage continuous engagement throughout the entire academic year.**
- **To help students understand the shift in the education system, where they are at the center of the learning process, as opposed to the traditional teacher-centered approach. Students are expected to actively participate in all course activities and obligations from the very beginning and establish two-way communication with the instructor.**

14. Learning outcomes:

At the end of the semester/course, successful students who have consistently fulfilled their obligations throughout the entire teaching period will be able to:

- **Understand the significance of this course and its subject matter, as well as existing initiatives and methods for addressing issues using geo-environmental engineering approaches.**
- **Utilize available literature related to solving various problems covered in this course.**
- **Pass the final exam during the first exam sessions at the end of the semester.**

15. Course content:

Geo-Environmental Engineering Course Overview
Introductory Session
Presentation of the course syllabus (literature, course content, objectives, expected competencies, teaching and assessment methods, additional course-related information, etc.).
General Information on Geo-Environmental Engineering
Definition, key concepts, and scope of study.
Environmental engineering in mining.
Environmental Effects of Mining
Effects on Land
Changes in topography.
Subsidence and soil stability.
Overburden and waste disposal.
Erosion and land degradation.
Biological Effects
Impact on flora and fauna.
Hydrological Effects
Changes in surface and groundwater systems.
Effects on Air Quality
Pollutants and emissions from surface and underground mining operations.
Emissions from in-situ mining.
Social Effects
Aesthetic impact.
Land use and displacement.
Cultural heritage and mining-induced damage.
Environmental Protection Technologies in Mining
Soil Protection
Mining excavation methods and subsidence control.
Surface reclamation and landscape restoration.
Flora and Fauna Protection
Preservation and rehabilitation measures.
Water Protection
Surface and groundwater protection strategies.
Air Protection
Emission control methods.
Sources of air pollution (fugitive, point, and mobile sources).
Cost and efficiency of air quality protection measures.
Cultural Heritage Protection
Conservation and mitigation strategies.
Mitigation of Blasting Effects
Rock displacement control.
Seismic impacts of blasting.
Air pressure waves, dust, and gas emissions.
Environmental Regulations in Mining
Overview of relevant policies, laws, and compliance measures.

16. Learning methods:

Teaching Methods
Lectures

- **Use of multimedia tools (presentations, videos, simulations).**
- **Active student participation and discussions.**

Seminar Papers

- **Preparation and presentation of individual or group research projects.**

Distance Learning (if applicable)

- **Some parts of the course may be conducted online, in accordance with the Senate's decision.**

Consultations

- **Regular consultation sessions for additional support and clarification.**

17. Assessment methods:

Student Evaluation Criteria

1. **Attendance and Participation in Lectures**
2. **Individual Project / Seminar Paper**
3. **Tests**
4. **Final Exam**

18. Assessment components:

Grading System

The final grade is based on the total number of points accumulated by fulfilling pre-exam obligations and passing the final exam. The maximum possible score is 100 points, determined according to the following grading scale:

Point Distribution:

- **Lecture Attendance: 0-10 points**
- **Activity: 0-10 points**
- **Tests: 0-20 points**
- **Seminar Paper: 0-15 points**
- **Pre-exam Activities Total: 55 points**
- **Final Exam: Up to 45 points**

Final Grade (ECTS Comparable Scale):

- **10 (A) – Exceptional performance with no or minimal errors (95-100 points)**
- **9 (B) – Above average, with minor errors (85-94 points)**
- **8 (C) – Average, with noticeable mistakes (75-84 points)**
- **7 (D) – Generally good, but with significant deficiencies (65-74 points)**
- **6 (E) – Meets minimum criteria (54-64 points)**
- **5 (F, FX) – Does not meet minimum criteria (Below 54 points)**

19. Mandatory reading list:

1. **Karadžin, Z., Šišić, R., Uvod u geookolinski inžinjering, Univerzitetski udžbenik, Tuzla, 2020.**
2. **Marcus, J., Mining Environmental Handbook: Effects of mining on environment and american environmental controls on mining, 2003**
3. **Burke , G., Singh, B., Handbook of Environmental Management and Technology, 2nd edition, Wiley Interscience, 2005**

20. Additional reading list:

21. Web sources:

22. Applicable from the academic year:

2025/26.

23. Adopted in the Faculty/Academy session: