UNIVERSITY OF TUZLA UNIVERZITET U TUZLI

SYLLABUS

1. Course title:

FLUID MECHANICS AND BASICS OF CLIMATOLOGY

2. Code:

LRUDMFOK

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 | 3

9. Weekly contact hours and student workload:

	Semester (1)	Semester (2)	(for two-semester courses)	Workload: (hours)
9.1. Lectures	3		Classes:	45,00
9.2. Seminars	0		Individual work:	80,67
9.3. Laboratory / Practice classes	1		In total:	125,67

10. Faculty:

Mining, Geology and Civil Engineering

11. Department/study program:

Mining Engineering

12. Lecturer:

PhD Edin Delić Full Professor

13. Course aims:

Introducing students to the basics of fluid mechanics, climatology, and aerology and their application in the workplace.

- Introducing students to the basics of fluid mechanics, climatology, and aerology and their application in the mining work

environment.
- Improving skills in applying acquired knowledge to solve various fluid-related problems in mining.
- Enhancing communication skills in written and verbal form.
- Improving skills related to individual and team/group work.
- Enhancing students' logical engineering thinking skills.

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:
- Utilize the available literature related to solving various problems in the field of fluid mechanics in mining.
- Solve problems of varying complexity, both individually and in teams, and present their solutions in written or verbal form.
- Understand the significance of this course in solving various problems related to mining project planning, safety, and protection.
- Pass the final exam during the first exam periods at the end of the semester.

15. Course content:

Fundamentals of Fluid Mechanics and Climatology
- Fluid statics
- Buoyancy and floating of bodies
- Kinematics and dynamics of fluid flow
- Fluid flow resistance and fluid machines
- Pneumatic and hydraulic working machines
- Filtration and drainage of gases and water
- Fundamentals of CFD (Computational Fluid Dynamics)
- Principles of operation and practical examples of modeling laminar, turbulent, and reactive fluid flow using appropriate software packages
- Fluid distribution networks
- Problem-solving using fundamental laws of distribution networks

Atmospheric and Earth Sciences
- Structure of the atmosphere and Earth
- Atmospheric processes and air temperature
- Climatology: atmosphere structure, temperature, and atmospheric processes
- Fundamentals of meteorology
- Global energy balance and climate change
- Earth's hydrological cycle
- Earth's climate and atmospheric circulation
- Anthropogenic impact on global climate
- Global warming and pollution

16. Learning methods:

The primary learning methods include:
- Lectures
- Team/Group Projects (Seminar Papers)
- Short Tests covering the core concepts of completed topics or instructional units

Continuous participation in lectures, engagement in thematic discussions, initiative, and other activities that enhance the quality of teaching will be rewarded with additional points in the final grade, as recorded by the course instructor.
Project Work:
- Completing individual and team projects is mandatory.
- During the semester, students will be required to complete at least one team project.

Testing and Assessment:
- After completing specific course topics, the instructor will organize tests or mini-exams. These will consist of a set number of questions and tasks to assess students' acquired knowledge.
- Test dates will be announced at least seven days in advance to allow adequate preparation.
- Questions in quick tests will focus on the most recently covered topic or instructional unit.

4o

17. Assessment methods:

Knowledge Assessment Methods:
- Written and oral examinations

Student Evaluation Criteria:
1. Attendance and participation in lectures
2. Written/calculative part of the exam – test
3. Written/theoretical part of the exam – test
4. Individual/group projects or seminar papers

5. Final exam

18. Assessment components:

Distribution of Points:

- **50 points are awarded throughout the teaching process, as follows:**
  - **Attendance and participation in lectures: up to 10 points**
  - **Seminar papers, team projects, essays: up to 30 points**
  - **Tests: up to 10 points**
- **Total points for pre-exam obligations: 50 points**
- **Final exam: 50 points**

Grading System (Comparable to the ECTS scale):

- **10 (A) - Exceptional performance with no errors or only minor errors, awarded 95-100 points**
- **9 (B) - Above average, with a few errors, awarded 85-94 points**
- **8 (C) - Average performance with noticeable errors, awarded 75-84 points**
- **7 (D) - Generally good, but with significant shortcomings, awarded 65-74 points**
- **6 (E) - Meets the minimum criteria, awarded 54-64 points**
- **5 (F, FX) - Does not meet the minimum criteria, awarded less than 54 points**

19. Mandatory reading list:

1. Robert W. Fox i Alan McDonald, Introduction to Fluid Mechanics, J.W. and sons, 1992
2. Fluid Dynamics, Schaums Outlines, McGraw Hill, bilo koje izdanje
3. Vesna Jovičić i Anka Čović, Odvodnjavanje rudnika, RGF Beograd 1985. godine
4. Georgije Hajdin, Mehanika fluida (knjiga I i II), Gradjevinski fakultet Beograd, 1992. godine
5. Živoslav Adamović, Osnovi hidraulike i održavanja uljno-hidrauličnih sistema, Zavod za udžbenike i nastavna sredstva Beograd, 1997
6. Radomir Simić i ostali, Odvodnjavanje površinskih kopova, RI Beograd, 1984.
7. E. Delić, A. Bašić, R. Šišić, Mehanika fluida, klimatologija i aerologija, Univerzitet u Tuzli, 2008.
8. Č. Maksimović, A. Stojimirović, S. Đorđević, D. Prodanović, A. Tomanović, V. Marinković, Zbirka zadataka iz mehamehanike fluida, Građevinski fakultet Univerziteta u Beogradu, 2002.

20. Additional reading list:

21. Web sources:

http://www.sciencedirect.com/science/book/9780123821003
http://journals.cambridge.org/action/displayJournal?jid=FLM#.Ve1k3PmeDRY http://web.mit.edu/hml/notes.html
https://en.wikipedia.org/wiki/Fluid_mechanics https://hr.wikipedia.org/wiki/Mehanika_fluida

22. Applicable from the academic year:

2025/26

23. Adopted in the Faculty/Academy session: