

## SYLLABUS

**1. Course title:**

Pipelines

**2. Code:**

**3. Cycle of study:**

1

**4. ECTS credits:**

3

**5. Type of course:**

Elective

**6. Prerequisites:**

**7. Class restrictions:**

**8. Duration / semester(s):**

I

VIII

**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: 55,83
9.3. Laboratory / Practice classes	0			In total: 78,33

**10. Faculty:**

Faculty of Mechanical Engineering

**11. Department/study program:**

ETFI

**12. Lecturer:**

dr.sci. Izet Alić, professor

**13. Course aims:**

The aim of the course is to acquaint students with the principles of transporting compressible and incompressible fluids through simple and complex pipelines

#### 14. Learning outcomes:

At the end of the semester/course, successful students, who continuously performed their duties during the entire teaching period, will be able to:

- explain the basic principles of fluid transfer through pipes, including the equation of continuity, the law of momentum and the law of energy;
- application of criteria for the selection of materials and dimensioning of pipelines in accordance with the loads;
- analyze and calculate hydraulic losses in pipe systems;
- understand the principles and procedures of testing and control of pipeline systems.

#### 15. Course content:

1. Physical properties of fluids. Line losses. Local losses.
2. Calculation of pressure drop, flow and diameter of simple pipelines. Distribution and position of pipelines; materials for making pipelines.
3. General information about pipeline networks and their components. Pipe branching. Parallel pipe connection. Series pipe connection.
4. Standardization and typification in the field of pipelines. Pipe fittings: Valves; Latches; Faucets; Valves; Pipeline supports; Temperature expansion compensators.
5. Plumbing. Hydraulic calculation of main water mains and networks;
6. Hydraulic impact.
7. Hydraulic impact. Protection against hydraulic shock.
8. Test
9. Oil pipelines. Production and processing of crude oil. Construction of oil pipelines.
10. Hydraulic calculation of oil pipelines.
11. Gas pipelines and steam pipelines: Types and production of gas; Classification and elements of gas pipelines and steam pipelines;
12. Hydraulic calculation of gas pipelines;
13. Hydraulic calculation of pipelines for transporting superheated water vapor;
14. Hydraulic calculations of pipelines for the transport of dry saturated and wet steam.
15. Pipeline testing.

#### 16. Learning methods:

Lectures and exercises with the use of multimedia tools, active learning techniques and with the active participation and discussions of students. In addition, students have the opportunity to consult with the subject teacher and assistant.

#### 17. Assessment methods:

1 test-written check

seminar work

final exam - oral examination

The test is done halfway through the semester from the areas covered in the lectures until then. The student must score at least 50% of the points on the test in order for the points scored on the test to be recognized. At the final exam, students who did not pass the test first take the failed test. Preparation and defense of a seminar paper is mandatory. Those who passed the test on the final exam take the theory from the remaining areas that are not covered by the test. At the same time, it is necessary to win a minimum of 30% of points (10.5 points) in order to be able to receive a passing grade (if this is sufficient in addition to the points from the pre-examination obligations). The grade is formed according to the number of accumulated points, and according to Article 107 of the Law on Higher Education TK.

Grade	Described	Letter	Points
5 (five)	Does not meet minimum criteria	F, FX	<54
6 (six)	Meets minimum criteria	E	54-64
7 (seven)	Generally good, but with significant shortcomings	D	65-74
8 (eight)	Average, with noticeable errors	C	75-84
9 (nine)	Above average, with occasional errors	B	85-94
10 (ten)	Exceptional achievement with no errors or with minor errors	A	95-100

#### 18. Assessment components:

Class attendance: max. 5 points (the maximum number of points for attendance is obtained for a minimum of 90% attendance at lectures and exercises; with an increase in the number of absences, the number of points decreases proportionally).

Test - 30 points

Seminar work - 30 points

Pre-exam requirements total 65 points

Final exam = 35 points

#### 19. Mandatory reading list:

1. Markoski M.: Cijevni vodovi, Mašinski fakultet, Beograd, 1996.
2. Šašić M.: Transport fluida cijevima, Naučna knjiga, Beograd, 1989.

**20. Additional reading list:**

**21. Web sources:**

**22. Applicable from the academic year:**

2023/2024

**23. Adopted in the Faculty/Academy session:**