

## SYLLABUS

**1. Course title:**

PIPELINES

**2. Code:**

(max. 20 characters)

**3. Cycle of study:**

1

**4. ECTS credits:**

3

**5. Type of course:** Mandatory  Elective**6. Prerequisites:**

(max. 110 characters)

**7. Class restrictions:**

(max. 150 characters)

**8. Duration / semester:**

1

7

**9. Weekly contact hours:**

9.1. Lectures:

2

9.2. Seminars:

1

9.3. Laboratory/Practice classes:

0

**10. Faculty:**

Faculty of Mechanical Engineering

**11. Department/study program:**

Energy engineering

**12. Lecturer:**

dr.sc. Izet Alić, professor

**13. Lecturer's e-mail:**

izet.alic@untz.ba

**14. Web site:**

www.mf.untz.ba

**15. Course aims:**

The aim of the course is to provide students with the basic knowledge of transport of compressible and incompressible fluids through the simple and complex pipelines.

**16. Learning outcomes:**

At the end of the semester / course successful students, who during the entire period of teaching continuously perform their duties, will be trained to independently solve problems in the field of transport fluid pipes, ie. will be able to perform hydraulic calculations of pipelines for various purposes (steam pipelines, gas pipelines, water supply ....).

**17. Course content:**

Hydraulic calculation of simple pipelines: Line losses. Local losses. Calculation of pressure drop, flow and diameter of simple pipes. Calculation of non-circular cross-section. Overview of pipeline networks and their components. Branching pipe systems. Parallel pipe connection. Serial connection of pipes. Pipe network. Solving methods for steady fluid flow model. The method Hardy Cross. The resulting working characteristics of a number of interconnected pipelines. Hydraulic calculation of main waterways and networks; Water hammer. Gas and steam pipelines: Classification and elements of gas pipelines and steam pipelines; Hydraulic calculation of the gas pipeline in the non-isothermal flow; Hydraulic calculation of pipelines for transportation of superheated steam; Hydraulic calculation of pipelines for transport of dry-saturated and wet steam. Piping components: Materials for the pipelines. Pipeline fittings: valves, gate valves, taps, flaps, piping supports, compensators of temperature expansion joints.

**18. Learning methods:**

The most important learning methods in the subject are:

- Lectures with the use of multimedia resources, active learning techniques and with active participation and discussion of students;
- Auditorial exercises

**19. Assessment methods:**

In the eighth week of the semester students take the writing test No. 1, which includes previously treated topics with lectures and exercises. The test consists of theoretical questions, where each issue contain the number of points that carries a specific question. The maximum score on the test is 25. In the fifteenth week of the semester students take the writing test number 2, which includes processed topics with lectures and exercises after the test the first test consists of theoretical questions, where each issue contain the number of points that carries a specific question. The maximum score on the test is 25. In the framework of pre-exam students are required to independently develop programming task in the field discussed in class. Program task to a written submission concerned assistant and at the same time it is presented orally what has been done. Program task carries a maximum of 20 points. The student must receive at least 50% of points on each test in order to apply for a points earned on the test. If not satisfied in one of the tests in the time of the final exam again lays nepoložen test. The final exam is taken orally (when laid continuously through tests) through a brief questioning. Be sure to achieve a minimum of 10 points on the final exam. Students who do not pass through the test, the time of the final examination shall take an integrated test, and when the same pass, the theory lay in writing, if necessary, with an oral explanation.

**20. Assessment components:**

Rating exam is based on the total number of points a student earned by completing pre-exam requirements and exams, according to the quality of the acquired knowledge and skills, and contains a maximum of 100 points, and is determined according to the following scale:

The presence continues 5 points

2 tests x 25 = 50 points

Programming example 20 points

Total pre-exam 75 points

Final exam 25 points

**21. Required reading list:**

1. Šašić M.: Transport fluida cijevima, Naučna knjiga, Beograd, 1989.
2. Šašić M.: Zbirka riješenih zadataka iz transporta fluida cijevima, Naučna knjiga, Beograd, 1987
3. Markoski M.: Cijevni vodovi, Mašinski fakultet, Beograd, 1996.

**22. Web sources:**

(max. 687 characters)

**23. Applicable starting from the academic year:**

2015/2016

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

01.06.2015