

## SYLLABUS

**1. Course title:**

Oil hydraulics and pneumatics

**2. Code:****3. Cycle of study:**

1

**4. ECTS credits:**

4

**5. Type of course:** Mandatory  Elective**6. Prerequisites:****7. Class restrictions:****8. Duration / semester:**

1

5

**9. Weekly contact hours:**

9.1. Lectures:

2

9.2. Seminars:

0

9.3. Laboratory/Practice classes:

1

**10. Faculty:**

Faculty of Mechanical Engineering

**11. Department/study program:**

Mechatronics / Power mechanical engineering

**12. Lecturer:**

dr.sc. Almir Osmanović, Assistant Professor

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

almir.osmanovic@untz.ba

**14. Web site:**

www.mf.untz.ba

**15. Course aims:**

The aim of the course is to comprehend students with the basic principles of hydraulics and pneumatic systems and hydraulic and pneumatic control. Students will be able to work independently / or in a team to design and maintenance of hydraulic and pneumatic systems.

**16. Learning outcomes:**

At the end of the semester, successful students, who have continued their duties throughout the academic year, will be trained to: apply the acquired knowledge and skills to develop, design and maintain hydraulic and pneumatic systems.

**17. Course content:**

Introduction to hydraulics and pneumatics, application, advantages and disadvantages. Physical basics. Elements for energy transformation. Hydraulic fluids. Hydraulic pumps and hydraulic motors. Calculation of hydraulic pumps and hydraulic motors. Hydraulic pump capacity regulation. Hydraulic Cylinders. Hydraulic accumulators. Control elements. Distributing valves, pressure and flow valves. Auxiliary elements (tanks, filters, pipelines..). Cooling and heating devices. Hydrostatic transmissions. Maintenance of hydraulic systems. Proportional and servo hydraulics. Compressed air preparation and distribution. Pneumatic elements. Pneumatic motors, construction and design. Pneumatic valve. Pneumatic control. Pneumatic control methods. Control using the PLC. Methods for regulation of pneumatic servo systems. Pneumatic servo systems.

**18. Learning methods:**

Lectures - theoretical lectures, active two-way communication student professor, mandatory attendance of students.  
Laboratory exercises - laboratory work, acquisition of practical skills related to subject matter, active two - way communication student - assistant, mandatory attendance of exercises.  
Written exam (from the theoretical part and tasks).  
Assignments, project paper / Graphic Works - independent work of a student to solve the problem.

**19. Assessment methods:**

Defending assignments, project paper / graphic works - student defends his / her work in front of the professor / assistant - answers the questions asked.  
Written exam (from the theoretical part) - student solves questions / tasks in a given time period related to the subject of study.  
Laboratory Exercise Report - Submission of reports on activities related to the realization of certain laboratory exercises, answering questions asked by the Assistant.  
Final Exam - oral answer to the questions asked by professors.  
Corrective Exam (Oral) - Oral Answering Questions.

**20. Assessment components:**

Evaluation will be based on the following activities:

Written examination (1 x 20) - 20 points

Theoretical part of exam (2 x 20x) - 40 points

Final (oral) exam - 30 points

Assignments, project paper- 10 points

Total: 100 points

**21. Required reading list:**

Bauer G., 2011. Ölhydraulik. Berlin, Heidelberg: Springer.

Savic, V., 1991. Uljna hidraulika I. Zenica: Dom štampa Zenica.

Nikolić, G., 1990. Pneumatsko upravljanje. Zagreb: Fakultet strojarstva i brodogradnje.

**22. Web sources:****23. Applicable starting from the academic year:**

2015/16

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

01.06.2015