

Title <b>Mechanical Constructions</b>	Code <b>1010101241010100346</b>
Field <b>Environmental Engineering First-cycle Studies</b>	Year / Semester <b>2 / 4</b>
Specialty -	Course <b>core</b>
Hours Lectures: <b>2</b> Classes: -    Laboratory: -    Projects / seminars: <b>2</b>	Number of credits <b>5</b>
	Language <b>polish</b>

**Lecturer:**

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**Status of the course in the study program:**

Core course.

**Assumptions and objectives of the course:**

The main aim of the course is application of mechanical strength principles for the design of mechanical constructions. Application of pumps and fans in heating, air conditioning and refrigeration systems.

**Contents of the course (course description):**

Mechanical loads and stresses. Fatigue strength. Uncoupled connections - welded and rivet connections, and coupled connections ? screw connections. The function of fittings. Shutoff valves, dampers and non-return valves. Control valves and safety valves ? construction, principles of functioning, application. Thermostatic valves - construction, principles of functioning, criterion of throttling. Types of pumps ? operation parameters: capacity, pumping pressure, power, efficiency. Pumping system ? geometrical and energy quantities. Cavitations in pumping systems. Characteristics of rotary pumps and their operating point. Parallel and series operation of pumps. Control of pumps capacity. Fans and blowers ? characteristics of devices, specific measures. Types of fans. Characteristics of centrifugal fans. Axial fans ? construction, velocity and pressure pattern, supply power. Control of axial fans.

**Introductory courses and the required pre-knowledge:**

Strength of materials. Flow mechanics.

**Courses form and teaching methods:**

Lectures. Project.

**Form and terms of complete the course - requirements and assessment methods:**

Lectures ? final test. Project evaluation and discussion.

**Basic Bibliography:**

1. Janiak M. Urządzenia mechaniczne w inżynierii środowiska. Cz.1. Wydawnictwo Politechniki Poznańskiej Poznań 1993.
2. Janiak M., Krzyżaniak G. Urządzenia mechaniczne w inżynierii środowiska. Cz. 2. Wydawnictwo Politechniki Poznańskiej Poznań 1995.

3. Praca zbiorowa Mały Poradnik Mechanika tom I i II. WNT Warszawa 1988
4. Stępniewski Pompy PWN Warszawa

**Additional Bibliography:**