

Title <b>Elective Course II (Wykład monograficzny (obieralny))</b>	Code <b>1010402221010410672</b>
Field <b>TECHNICAL PHYSICS</b>	Year / Semester <b>1 / 2</b>
Specjalty -	Course <b>elective</b>
Hours Lectures: <b>2</b> Classes: -    Laboratory: -    Projects / seminars: -	Number of credits <b>3</b>
	Language <b>polish</b>

**Lecturer:**

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

Elective course of the study for Technical Physics, Faculty of Technical Physics.

**Assumptions and objectives of the course:**

Acquaintance of the students with the basis of the theories of the rarefied gases, high vacuum technique and method of the low temperatures obtaining.

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

The program of the course contains following topics:

Basis of the kinetic theory of the gases, viscosity, effusion and diffusion phenomena. Thermal conduction and flows of the gas. Physical and chemical processes on the body surface: sorption, de-sorption and adsorption.

Basis of the vacuum technologies. Vacuum components. Constructing materials. Principles of the designing and operating conditions of the vacuum systems.

Methods for generation and control of the vacuum. Classification and maintenance of the vacuum pumps. Basis of the vacuum metrology. Classification and principles of the operation of vacuum gauges. Mass spectrometry. Leaks detections.

Basis of the cryogenics. Definitions. Low temperature obtaining methods. Properties of the matters under cryogenic conditions.

Applications of the vacuum and low temperature techniques.

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

Basic knowledge of physics, technology and chemistry.

**Courses form and teaching methods:**

Lecture supported by Powerpoint presentation

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

Oral examination.

**Basic Bibliography:**

1. J. A. Hałas, Technologia wysokiej próżni, PWN, Warszawa 1980
2. J. Groszkowski, Technika wysokiej próżni, PWN, Warszawa 1978
3. J. Groszkowski, Urządzenia próżniowe, WSiP, Warszawa 1982

4. G. K. White, Technika doświadczalna w fizyce niskich temperatur, PWN Warszawa 1965
5. C. Benvenuti. Phys. Sci. T22, 48-54, (1988)
6. Katalogi i instrukcje obsługi producentów urządzeń próżniowych

**Additional Bibliography:**

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