

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Dynamics of gasses		Code 1010632211010630275
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Thermal Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: - Laboratory: - Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: prof. dr hab. inż. Michał Ciałkowski email: michal.cialkowski@put.poznan.pl tel. (061) 665-22-05 Faculty of Working Machines and Transportation ul. Piotrowo 3; 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	In mathematics, physics and fluid mechanics in the range shown in college.
2	Skills	Able to apply the scientific method to solve problems
3	Social competencies	He knows the limitations of their knowledge and skills, is able to accurately formulate questions, understands the need for further education
Assumptions and objectives of the course: - To familiarize students with basic knowledge theoretical governing the movement of ideal gases.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has an expanded knowledge of mathematics in area of numerical methods used in optimization, computer simulation, linear algebra, interpolation and approximation. - [K2A_W01]		
2. Has an extended knowledge in selected areas of technical mechanics related to the chosen specialization (e.g. soil mechanics). - [K2A_W16]		
3. Has an in-depth knowledge of the design and principles of operation and grading machines from the equipment of the chosen group. - [K2A_W18]		
Skills:		
1. Is able to freely use an international language in contacts with professionals from the same field of study. - [K2A_U01]		
2. Is able to use the acquired knowledge of thermodynamics and fluid mechanics for the simulation of thermodynamic processes in technological equipment, using special computer programs. - [K1A_U05]		
Social competencies:		
1. Is able to think and act in an entrepreneurial manner. - [K2A_K05]		
2. Is aware of and understands the importance and impact of non-technical aspects of mechanical engineering activities and its impact on the environment, is aware of responsibility for decisions. - [K2A_K02]		
3. Is able to set priorities for realization of undertaken tasks. - [K2A_K04]		

Assessment methods of study outcomes		
- The written examination		
Course description		
- Bernoulli's equation. Critical parameters of gas. Classification of gas flows. Wave phenomena in one-dimensional flow. Oblique shock wave. Polar shock wave. The shock wave in a flat oplywie wedge. Some problems of the theory of linear. Linearization equation velocity potential. Transformation Prandtl and Glauerta. Some analytical solutions.		
Basic bibliography:		
1. Prosnak W.J., Mechnika plynów , t II PWN Warszawa 1971		
Additional bibliography:		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in classes	30	
2. Przygotowanie do egzaminu	5	
3. Udział w egzaminie	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	37	2
Contact hours	32	2
Practical activities	1	1