STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Fluid Mechanics		**1010632221010630432**

Field of study	Profile of study (general academic, practical)	Year /Semester
Mechanical Engineering	**(brak)**	**1 / 2**
Elective path/specialty	**Subject offered in:**	**Course (compulsory, elective)**
Thermal Engineering	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours	No. of credits
Lecture: **1** Classes: **1** Laboratory: **-** Project/seminars: **-**	**2**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**2 100%**
Technical sciences	**2 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Wiadomości w zakresie matematyki i fizyki.
2	**Skills**	The student can describe the basic physical phenomena, and to perform calculations associated with them.
3	**Social competencies**	Student is able to prioritize important in solving the tasks posed in front of him. The student demonstrates self-reliance in solving problems, acquire and improve their knowledge and skills.

Assumptions and objectives of the course:

Getting to Know the theoretical foundations and applications of fluid mechanics.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Has a basic knowledge of technical fluid mechanics (ideal gases and ideal fluids), Newtonian and non-Newtonian viscous fluids, heat and fluid flow machinery. - [K1A_W07]
2. Has a basic knowledge of linear measurement methods, stress, strain, velocity, temperature and fluid streams measurement, including electrical methods of measurement. - [K1A_W14]

Skills:

1. Is able to perform rudimentary technical calculations in fluid mechanics and thermodynamics, such as heat and mass balance, pressure loss in pipes, selected parameters of blowers and fans in ventilation and transportation systems, calculate the thermodynamic flows in thermal machines. - [K1A_U17]
2. Is able to use acquired mathematical theories to create and analyze simple mathematical models of machines, their components and simple technical systems. - [K1A_U07]

Social competencies:

1. Has a sense of responsibility for one?s own work and is willing to comply with the principles of teamwork and taking responsibility for collaborative tasks. - [K1A_K04]
2. Is aware of the importance of behavior in a professional manner, compliance with the rules of professional ethics and respect for cultural diversity. - [K1A_K03]

Assessment methods of study outcomes

Lecture: exam

Exercise: test

Laboratory: continuous evaluation for each course - favoring growth met on skills issues, assessment report performed exercise

Course description

Subject fluid mechanics. Model continuum. Some of the concepts and theorems of the kinematics of fluids. Streamlines. Surface current. Track fluid element. The acceleration of the fluid element. Substantial derivative, convection and local. Circulation. The basic equations of fluid dynamics. The principle of conservation of mass. The principle of conservation of momentum and angular momentum. The forces acting on the fluid. General properties of fluid motion is not sticky and not conductive of heat. Euler's equation. General integrals of Euler equations. Fluid statics. Euler's equation of equilibrium. Determination and equipotential surface pressure distribution. Sudden fluid solids on the walls. Swimming and stability of floating bodies. The reaction exerted by the liquid stream. Navier - Stokes.

Basic bibliography:

1. Ciałkowski M., Mechanika Płynów. Skrypty Uczelniane. Wydawnictwo Politechniki Poznańskiej.

2. Ciałkowski M., Bartoszewicz J., Frąckowiak A., Grudziński M., Grzelczak M., Kołodziej J., Piątkowski R., Rybarczyk J., Wróblewska A., Mechanika płynów: zbiór zadań z rozwiązaniami, Wydawnictwo Politechniki Poznańskiej, Poznań 2008.

3. Prosnak W.J. Mechanika Płynów, t. I. PWN Warszawa 1971

Additional bibliography:

1. Gołębiewski C., Łuczywek E., Walicki E., Zbiór zadań z mechaniki płynów, PWN Warszawa1978

Result of average student's workload

Activity	Time (working hours)
1. Participation in the lecture	7
2. Fixation of lectures.	2
3. Consultation	25
4. Preparing to exam pass	3
5. Participation in the exam	14
6. Preparing to exercise	15
7. Participation in exercise	5
8. Fixation of exercise	1
9. Completion of exercise.	7
10. Preparing to pass	14
11. Preparing to laboratory	15
12. Fixation theory of laboratory	14

Student's workload

Source of workload	hours	ECTS
Total workload	152	2
Contact hours	66	2
Practical activities	43	2