STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Materials Technology**		Code **1010101231010130898**
Field of study **Environmental Engineering First-cycle Studies**	Profile of study (general academic, practical) **general academic**	Year /Semester **2 / 3**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **30** Classes: **-** Laboratory: **30** Project/seminars: **-**		No. of credits **4**
Status of the course in the study program (Basic, major, other) **major**	(university-wide, from another field) **university-wide**	
Education areas and fields of science and art **technical sciences** **Technical sciences**		ECTS distribution (number and %) **4 100%** **4 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Chemistry and physics: basic terms related to properties of solids and liquids.
2	**Skills**	Ability to read technical drawings.
3	**Social competencies**	Awareness of need to constantly update and supplement knowledge and skills.

Assumptions and objectives of the course:

Acquire of basic knowledge and skills in materials technology and fittings techniques essential to solving typical practical problems appear in environmental engineering.

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

Knowledge:

1. Student knows basic chemical, physical, mechanical and technological features of materials used in environmental engineering and understand theirs significance - [K_W02, K_W05, K_W07]
2. Student has a basic knowledge concerning of using metals and alloys, polymers and sanitary ware in environmental engineering - [K_W02, K_W05, K_W07]
3. Student has a basic knowledge concerning of using various kind of fittings in accordance with piping materials - [K_W02, K_W05, K_W07]
4. Student knows and understands principle of various kind of valves - [K_W02, K_W05, K_W07]
5. Student has a knowledge concerning of materials resistance at external factors - [K_W02, K_W05, K_W07]
6. Student understands the need for appropriate selection of materials in accordance with their properties - [K_W02, K_W05, K_W07]
7. Student knows and understands limitations of fitting techniques used in environmental engineering - [K_W02, K_W05, K_W07]

Skills:

1. Student can show possible application of individual materials in environmental engineering - [K_U01, K_U013]
2. Student can select material for projects for technical subjects at next years of studies - [K_U01, K_U05, K_U013]
3. Student can point at possible kind of jointing for individual materials - [K_U01, K_U013]
4. Student can show application of individual kind of valves (fittings) - [K_U01, K_U013]

Social competencies:
1. Student understands the need for teamwork in solving theoretical and practical problems - [K_K03, K_K04]
2. Student is aware of the advantages, disadvantages and limitations technical solutions applied - [K_K01, K_K05]
3. Student sees the need for systematic increasing his skills and competences - [K_K01]
4. Student is aware of fundamental principles of industrial safety during installation work - [K_K01, K_K04, K_K05]

Assessment methods of study outcomes
Lectures
Written final multianswer test.
Practical exercise
Short tests.

Course description
Basic chemical, physical, mechanical and technological properties of materials used in environmental engineering.
Group of materials used in environmental engineering: iron alloys, cupper, cupper alloys, other metals and their alloys, polymers, sanitary ware. Advantages, disadvantages and limitations in using of individual materials. Possible interactions between different materials or between them and environment. Classification of materials due to their properties, production technology etc. Materials marking methods. Methods and technologies for materials jointing. Tools and equipment used in various jointing technologies.
Valves (fittings) used in environmental engineering (classification, applications, advantages, disadvantages and limitations in using).
Special technical solutions of sanitary installations.
Practical exercise:
1. Screwed connection of steel pipes
2. Soldered connections of copper pipes
3. Glued connections, welded and clamped connections of plastic pipes
4. Corrosion process of selected metals and their alloys

Basic bibliography:

1. Bagieński J., Materiałoznawstwo instalacyjne, Wydawnictwo Politechniki Poznańskiej, Poznań 1985

Additional bibliography:

1. Lars-Eric J., Rury z tworzy sztucznych do zaopatrzenia w wodę i odprowadzania ścieków, Polskie Stowarzyszenie Producentów Rur i Kształtek z Tworzyw Sztucznych, Toruń 2010
2. Hyla I., Tworzywa sztuczne. Własności-przetwórstwo-zastosowanie, Wydawnictwo Politechniki Śląskiej, Gliwice 2004

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures	30
2. Participation in practical exercises	30
3. Participation in consultations related to practical exercises	1
4. Preparation for tests of the practical exercises	15
5. Preparation for the exam	22
6. Presence at the exam	2

Student's workload

Source of workload	hours	ECTS
Total workload	100	4
Contact hours	63	3
Practical activities	30	1