

<b>STUDY MODULE DESCRIPTION FORM</b>		
Name of the module/subject <b>Sanitary and fire instalation systems</b>		Code <b>1010101231010135181</b>
Field of study <b>Environmental Engineering First-cycle Studies</b>	Profile of study (general academic, practical) <b>(brak)</b>	Year /Semester <b>2 / 3</b>
Elective path/specialty <b>-</b>	Subject offered in: <b>Polish</b>	Course (compulsory, elective) <b>obligatory</b>
Cycle of study: <b>First-cycle studies</b>	Form of study (full-time, part-time) <b>full-time</b>	
No. of hours Lecture: <b>30</b> Classes: <b>15</b> Laboratory: <b>-</b> Project/seminars: <b>15</b>		No. of credits <b>5</b>
Status of the course in the study program (Basic, major, other) <b>(brak)</b>		(university-wide, from another field) <b>(brak)</b>
Education areas and fields of science and art <b>technical sciences</b>		ECTS distribution (number and %) <b>5 100%</b>
<b>Responsible for subject / lecturer:</b> dr inż. Przemysław Muszyński email: przemyslaw.muszynski@put.poznan.pl tel. (61) 6653662 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań		
<b>Prerequisites in terms of knowledge, skills and social competencies:</b>		
1	<b>Knowledge</b>	Basic knowledge of fluid mechanics.
2	<b>Skills</b>	Applications of fundamental rights, depending on the mechanics of liquids and gases.
3	<b>Social competencies</b>	Awareness of the need to constantly update and supplement knowledge and skills.
<b>Assumptions and objectives of the course:</b> The acquisition by the students basic knowledge, skills in designing plumbing and fire.		
<b>Study outcomes and reference to the educational results for a field of study</b>		
<b>Knowledge:</b>		

<ol style="list-style-type: none"> <li>1. The student knows the basic concepts of water supply systems. (lectures) - [K_W05, K_W07]</li> <li>2. The student has knowledge of the operation and construction of water supply systems. (lectures) - [K_W05, K_W07]</li> <li>3. The student knows the possible solutions to water supply systems. (lectures) - [K_W05, K_W07]</li> <li>4. The student has the knowledge to determine the required pressure for water supply systems. (lectures, classes) - [K_W05, K_W07]</li> <li>5. The student has knowledge of hydraulic calculations install hot and cold water and circulation pipe. (lectures, classes) - [K_W05, K_W07]</li> <li>6. The student has knowledge of the construction of the water supply connection and selection of water meters. (lectures, classes) - [K_W05, K_W07]</li> <li>7. The student knows the principles of operation of devices booster. (lectures) - [K_W01, K_W05, K_W07]</li> <li>8. The student knows the rules of dimensioning hot and cold water. (lectures) - [K_W05, K_W07]</li> <li>9. The student has knowledge of the equipment for the preparation of hot water. (lectures) - [K_W01, K_W05, K_W07]</li> <li>10. The student has knowledge of the operation of the system of circulation - gravity and forced. (lectures) - [K_W01, K_W05, K_W07]</li> <li>11. The student has knowledge of the used materials (pipes and fittings) in sanitary systems. (lectures) - [K_W01, K_W05, K_W07]</li> <li>12. The student has knowledge of solutions and technologies used in sanitary systems. (lectures) - [K_W05, K_W07]</li> <li>13. The student has the knowledge for determining the demand for water. (lectures) - [K_W07]</li> <li>14. The student has the knowledge to carry out the selection of system components water and sewage. (lectures, classes) - [K_W05, K_W07]</li> <li>15. The student has the see of the functioning and construction of fire protection systems. (lectures) - [K_W05, K_W07]</li> <li>16. The student has the see of the functioning and construction of sewage systems. (lectures) - [K_W05, K_W07]</li> <li>17. The student has knowledge of hydraulic calculations sewage systems. (lectures, classes) - [K_W01, K_W07]</li> <li>18. The student knows the rules of dimensioning sewage systems. (lectures, classes) - [K_W01, K_W07]</li> <li>19. The student understands the functioning of the local wastewater treatment facilities. (lectures) - [K_W05, K_W07]</li> </ol>
<p><b>Skills:</b></p> <ol style="list-style-type: none"> <li>1. The student is able to perform hydraulic calculations hot and cold water. (classes, projects) - [K_U14, K_U15, K_U16]</li> <li>2. The student can choose the components of hot and cold water. (classes, projects) - [K_U14, K_U15, K_U16]</li> <li>3. The student is able to perform calculations sewage system. (classes, projects) - [K_U14, K_U15, K_U16]</li> <li>4. The student can choose the components of the sewage system. (classes, projects) - [K_U14, K_U15, K_U16]</li> <li>5. The student is able to design a water supply connection and select water meter. (classes, projects) - [K_U09, K_U14, K_U16]</li> <li>6. The student is able to design a sewer connection. (lectures) - [K_U09, K_U14, K_U16]</li> <li>7. The student is able to design the fire protection system. (lectures) - [K_U09, K_U14, K_U16]</li> <li>8. The student is able to design the installation of sewage from a local wastewater treatment. (lectures) - [K_U09, K_U14, K_U16]</li> </ol>
<p><b>Social competencies:</b></p> <ol style="list-style-type: none"> <li>1. The student understands the need for teamwork in solving theoretical and practical problems. (classes, projects) - [K_K03]</li> <li>2. The student sees the need for systematic deepening and extending their competence. (classes, projects) - [K_K01]</li> <li>3. The student is aware of the social role of technical university graduate. (classes, projects) - [K_K07]</li> </ol>

<b>Assessment methods of study outcomes</b>
<p>Lectures (efekt: W01, W05, W07):</p> <ul style="list-style-type: none"> <li>- a written final exam test students' knowledge.</li> <li>- pass - 50% points.</li> </ul>
<p>Tutorials (efekt: W01, W05, W07, U09, U14, U15, U16):</p> <ul style="list-style-type: none"> <li>- the accuracy of self-assessment tasks solutions,</li> <li>- continuous assessment of the students (rewarding students activity),</li> <li>- final test in the last week of the semester.</li> <li>- pass - 50% points.</li> </ul>
<p>Projects (efekt: U09, U14, U15, U16):</p> <ul style="list-style-type: none"> <li>- assessment of the correctness of the project,</li> <li>- the ocean of knowledge of the scope of the project,</li> <li>- continuous assessment of the students (rewarding students activity).</li> <li>- pass - 50% points.</li> </ul>

<b>Course description</b>		
<ol style="list-style-type: none"> <li>1. Basic concepts of water supply systems.</li> <li>2. Classification supply systems (water systems, cold and hot, circulation).</li> <li>3. Standards water requirement, standards related to the design of water supply systems.</li> <li>4. Construction of water supply systems (components of the system).</li> <li>5. Solutions of systems of water supply systems.</li> <li>6. The definition and calculation of the required pressure for supply system.</li> <li>7. Hydraulic calculations of water supply systems.</li> <li>8. Installation circulation - gravitational and forced; design principles circulation.</li> <li>9. Classification of devices for hot water.</li> <li>10. Water supply connection and home and residential water metres.</li> <li>11. Design, operation and use of equipment booster.</li> <li>12. Operation of pumping systems connected in series and in parallel.</li> <li>13. Design of fire protection systems.</li> <li>14. Basic concepts of sewage systems.</li> <li>15. Distribution of sewage systems (from municipal wastewater-economic and rainy; systems by the standard).</li> <li>16. Standards of designing sewage systems.</li> <li>17. Construction of sewage systems (components of the system).</li> <li>18. Calculations sewage systems.</li> <li>19. Local sewerage on greenfield sites.</li> <li>20. Materials, solutions and technologies in sanitary systems.</li> <li>21. Methods for selection of system components, cold water, hot water and sewage systems.</li> </ol>		
<b>Basic bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Sosnowski S., Tabernacki J.: Instalacje wodociągowe i kanalizacyjne w budynkach</li> <li>2. Tabernacki J., Sosnowski S., Heidrich Z.: Projektowanie instalacji wodociągowych i kanalizacyjnych</li> <li>3. Żuchowicki W.: Instalacje wodociągowe</li> <li>4. Żuchowicki W.: Odprowadzenie ścieków</li> </ol>		
<b>Additional bibliography:</b>		
<ol style="list-style-type: none"> <li>1. Chudzicki J., Sosnowski S.: Instalacje wodociągowe i kanalizacyjne. Materiały pomocnicze do ćwiczeń</li> <li>2. Chudzicki J., Sosnowski S.: Instalacje kanalizacyjne projektowanie, wykonanie, eksploatacja</li> <li>3. Chudzicki J., Sosnowski S.: Instalacje wodociągowe projektowanie, wykonanie, eksploatacja</li> <li>4. Żuchowicki W.: Zaopatrzenie w wodę</li> </ol>		
<b>Result of average student's workload</b>		
Activity	Time (working hours)	
1. Participation in lectures (contact hours)	30	
2. Participation in the project activities (contact, practical hours)	15	
3. Participation in tutorials (contact hours)	15	
4. Participation in consultations, related to the implementation of the project and tutorials (contact, practical hours)	10 15	
5. Implementation of project activities (practical hours, independent work)	15	
6. Preparation for the final test of tutorials (independent work)	20	
7. Preparation for the exam and the presence of the exam (independent work)	5	
8. The absence of the exam, completion of the exercise and defense of the project (contact hours)	5	
<b>Student's workload</b>		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	75	3
Practical activities	40	2