

| STUDY MODULE DESCRIPTION FORM  |   |  |
|--|---|--|
| Name of the module/subject<br><b>Diagnostics and studies of sanitary systems</b>   |   | Code<br><b>1010134291010105186</b>   |
| Field of study<br><b>Environmental Engineering Extramural First-</b>   | Profile of study (general academic, practical)<br><b>(brak)</b> | Year /Semester<br><b>5 / 9</b>   |
| Elective path/specialty<br><b>-</b>  | Subject offered in:<br><b>Polish</b>                            | Course (compulsory, elective)<br><b>elective</b>   |
| Cycle of study:<br><b>First-cycle studies</b>  | Form of study (full-time,part-time)<br><b>part-time</b>         |  |
| No. of hours<br>Lecture: <b>20</b> Classes: <b>10</b> Laboratory: <b>-</b> Project/seminars: <b>-</b>  |   | No. of credits<br><b>3</b>   |
| Status of the course in the study program (Basic, major, other)<br><b>(brak)</b>   |   | (university-wide, from another field)<br><b>(brak)</b>   |
| Education areas and fields of science and art  |   | ECTS distribution (number and %)   |
| <b>Responsible for subject / lecturer:</b><br>dr inż. Julian Skiba<br>email: julian.skiba@put.poznan.pl<br>tel. 61 6652078<br>Faculty of Civil and Environmental Engineering<br>ul. Berdychowo 4 60-965 Poznań   |   | <b>Responsible for subject / lecturer:</b><br>dr inż. Julian Skiba<br>email: julian.skiba@put.poznan.pl<br>tel. 61 6652078<br>Faculty of Civil and Environmental Engineering<br>ul. Piotrowo 5 60-965 Poznań |
| <b>Prerequisites in terms of knowledge, skills and social competencies:</b>  |   |  |
| 1  | <b>Knowledge</b>  | Knowledge of technical solutions , principles and requirements for water , sewage and gas systems  |
| 2  | <b>Skills</b>   | Design and operation of basic measuring devices used in environmental engineering laboratory known during the course of fluid mechanics , chemistry and biology  |
| 3  | <b>Social competencies</b>                                      | Awareness of the need to constantly update and supplement knowledge based on industry literature , conference materials and the acquisition of skills in bringing it to the practice of engineering          |
| <b>Assumptions and objectives of the course:</b>   |   |  |
| Getting to know the requirements for water , sewage and gas systems in the light of legal acts and engineering knowledge<br>The ability to select design and operating parameters for the evaluation of sanitary installations for correct operation<br>Familiarize yourself with the basic instruments and measurement systems for measuring parameters of the water , sewage and gas systems |   |  |
| <b>Study outcomes and reference to the educational results for a field of study</b>  |   |  |
| <b>Knowledge:</b>  |   |  |
| 1. The student knows the requirements for assessing the operation of water , sewage and gas systems - [-]<br>2. The student knows the basic parameters characterizing the correct operation of an installation - [-]   |   |  |
| <b>Skills:</b>   |   |  |
| 1. The student can choose what operating parameters , select the installation to assess the correctness of its actions - [-]<br>2. The student is able to choose and install a device for measuring the parameters of the installation determine its proper operation - [-]  |   |  |
| <b>Social competencies:</b>  |   |  |
| 1. Awareness of the need to constantly update and supplement knowledge based on industry literature , conference materials and the acquisition of skills in bringing it to the practice of engineering - [-]   |   |  |
| <b>Assessment methods of study outcomes</b>  |   |  |

| Evaluation criteria:<br>more than 100 points excelled<br>91?100 very good (A)<br>81? 90 good plus (B)<br>71? 80 good (C)<br>61? 70 satisfactory plus (D)<br>51? 60 satisfactory (E)<br>50 and below inadequate (F)  |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
|---|----------------------|----------------------|------------------------------|----------------|--|----|-----------------------------------|----|---|----------------------|----|---|
| <b>Course description</b>   |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| The basic parameters for the assessment of the proper operation of water and sewage systems<br>Research and requirements for system components<br>The instrument used for measuring and recording the pressure and flow in systems<br>Measurement of pressure and flow of water in water system of household ,multifamily and industrial buildings<br>Leak testing of water and sewage system<br>The study of energy efficiency pumps and pumping systems<br>Sewer Inspections TV<br>Pressure and flow test of hydrants<br>Measurements of pressure during the water hammer<br>Noise level measurements |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <b>Basic bibliography:</b><br>1. x<br>2. Chudzicki J.,Sosnowski St: Instalacje Wodociagowe , Wydawnictwo ?Seidel-Przywecki? Sp. z o.o., Warszawa 2009<br>3. Chudzicki J, Sosnowski St.: Instalacje Kanalizacyjne , Wydawnictwo ?Seidel-Przywecki? Sp. z o.o., Warszawa 2009<br>4. Barczyński A., Instalacje gazowe z miedzi Wyd. POLCEN, W-wa 1998<br>5. Switalski P. ABC techniki pompowej. Wyd. ZPBiP CEDOS Sp. z o.o. Wrocław 2008<br>6.<br>7.<br>8.<br>9.   |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <b>Additional bibliography:</b><br>1. Zbiór PN dotyczących wymagań i badania elementów instalacji oraz instalacji jako całości<br>2. Zbiór PN dotyczących wymagań i badania elementów instalacji oraz instalacji jako całości   |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <b>Result of average student's workload</b>   |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <table><tr><th>Activity</th><th>Time (working hours)</th></tr><tr><td>1. Participation in lectures</td><td>20</td></tr><tr><td>2. Participation in the exercises auditorium</td><td>10</td></tr><tr><td>3. Prepare to complete the course</td><td>15</td></tr></table>  | Activity             | Time (working hours) | 1. Participation in lectures | 20             | 2. Participation in the exercises auditorium | 10 | 3. Prepare to complete the course | 15 |   |                      |    |   |
| Activity  | Time (working hours) |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| 1. Participation in lectures  | 20                   |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| 2. Participation in the exercises auditorium  | 10                   |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| 3. Prepare to complete the course   | 15                   |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <b>Student's workload</b>   |                      |                      |                              |                |  |    |                                   |    |   |                      |    |   |
| <table><tr><th>Source of workload</th><th>hours</th><th>ECTS</th></tr><tr><td>Total workload</td><td>45</td><td>3</td></tr><tr><td>Contact hours</td><td>30</td><td>0</td></tr><tr><td>Practical activities</td><td>15</td><td>0</td></tr></table>  | Source of workload   | hours                | ECTS                         | Total workload | 45   | 3  | Contact hours                     | 30 | 0 | Practical activities | 15 | 0 |
| Source of workload  | hours                | ECTS                 |                              |                |  |    |                                   |    |   |                      |    |   |
| Total workload  | 45                   | 3                    |                              |                |  |    |                                   |    |   |                      |    |   |
| Contact hours   | 30                   | 0                    |                              |                |  |    |                                   |    |   |                      |    |   |
| Practical activities  | 15                   | 0                    |                              |                |  |    |                                   |    |   |                      |    |   |