

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Special sanitary systems		Code 1010101271010135183
Field of study Environmental Engineering First-cycle Studies	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty -	Subject offered in: Polish	Course (compulsory, elective) elective
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 15 Classes: 15 Laboratory: - Project/seminars: 15		No. of credits 4
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 %) 4 100% 4 100%
Responsible for subject / lecturer: dr inż. Przemysław Muszyński email: przemyslaw.muszynski@put.poznan.pl tel. (61) 6653662 Wydział Budownictwa i Inżynierii Środowiska ul. Piotrowo 5 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of drinking water treatment, wastewater collection and treatment, construction and operation of simple pumping systems, construction and operation of sanitation, basic knowledge of fluid mechanics.
2	Skills	Design of water treatment plants, pump selection and the necessary fittings in pump systems, solving pumping systems, design of sanitary hot and cold water, the use of fundamental rights, depending on the mechanics of liquids and gases.
3	Social competencies	Awareness of the need to constantly update and supplement knowledge and skills.
Assumptions and objectives of the course: The acquisition by the students basic knowledge, skills sanitary design in health resorts and laundries.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. The student knows the basic concepts associated with the operation of health resorts. (lectures) - [K_W05, K_W07] 2. The student has knowledge of the use of natural raw materials for medicinal health resorts treatment. (lectures) - [K_W01] 3. Students know the properties of medicinal raw materials. (lectures) - [K_W01] 4. The student has a basic knowledge of plumbing systems solutions medicated waters and mud. (lectures) - [K_W05, K_W07] 5. The student has a basic knowledge of the solutions of systems of water supply and sewerage installation in health resorts. (lectures) - [K_W05, K_W07] 6. The student knows the basic concepts associated with the operation of the laundry. (lectures) - [K_W05, K_W07] 7. The student has knowledge of the laundry equipment. (lectures) - [K_W07] 8. The student has a basic knowledge of plumbing systems solutions to water and sanitation in laundries. (lectures) - [K_W05, K_W07]		
Skills:		

1. The student is able to select the components to install mineral waters at health resorts. (classes, projects) - [K_U14, K_U16]
2. The student is able to design medicated waters systems. (classes, projects) - [K_U14, K_U16]
3. The student can choose the items of equipment rooms, branches of medicinal treatment and rehabilitation in the health resorts. (classes, projects) - [K_U14, K_U16]
4. The student is able to select the components to install operating mud. (classes, projects) - [K_U14, K_U16]
5. The student is able to design systems mud. (classes, projects) - [K_U14, K_U15, K_U16]
6. Student is able to develop a technological system of the plant mud. (classes, projects) - [K_U14, K_U15, K_U16]
7. The student is able to select the components to install supply and sewage disposal in laundries. (classes, projects) - [K_U14, K_U16]
8. The student is able to design plumbing and sewage in the laundry. (classes, projects) - [K_U14, K_U15, K_U16]
9. The student can choose the components of laundry equipment. (classes, projects) - [K_U14, K_U16]
Social competencies:
1. The student understands the need for teamwork in solving theoretical and practical problems. (classes, projects) - [K_K03]
2. The student sees the need for systematic deepening and extending their competence. (classes, projects) - [K_K01]
3. The student is aware of the social role of technical university graduate. (classes, projects) - [K_K07]

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

<ol style="list-style-type: none"> 1. Basic concepts of health resorts. 2. Natural Spa medicinal raw materials. 3. Treatment methods used in health resorts (balneotherapy, climate therapy, physiotherapy, physical therapy, hydrotherapy). 4. The properties of the gaseous medicated waters. 5. Classification of mineral water intakes. 6. Construction of mineral water intakes. 7. Construction and installation of components of mineral waters. 8. Types of systems installation and mineral waters. 9. Technological solutions pressurized gas-tight installation. 10. Requirements for containers of mineral water (sealed and non-pressure). 11. Solutions pumping in mineral waters systems. 12. Basic requirements for pipelines mineral waters. 13. Installations for heating and cooling mineral water. 14. Installations for the treatment of mineral waters. 15. Peat and its use in health resorts. 16. Installations for the operation of mud. 17. Solutions mud circulation in the application of its regeneration, the postoperative drainage mud. 18. Mines mud (medicinal raw material extraction from deposits of mud). 19. for the preparation of mud, slurry transport interventional. 20. Technological systems of plants mud. 21. Economy borowinami after surgery. 22. Treatment devices for the treatment in health resorts. 23. Technologies washing and cleaning of clothes. 24. Performance shift in the laundry. 25. Classification laundry (condominiums, home and block, industrial, cooperative, points of order, betting shops, hospital, hotel, etc.). 27. Structure and components of a typical laundry. 28. Types and characteristics of chemical plant clean garments. 29. Requirements for different types of pralniom (construction and installation). 30. Equipment installation of laundry facilities (water supply, sewage disposal). 		
<p>Basic bibliography:</p> <ol style="list-style-type: none"> 1. Nowakowski E.: Zakłady pralnicze 2. Madeyski A.: Podstawy inżynierii uzdrowiskowej 3. Madeyski A.: Podstawy balneotechniki 		
<p>Additional bibliography:</p> <ol style="list-style-type: none"> 1. Madeyski A.: Baseny kąpielowe-lecznicze i rehabilitacyjne 2. Madeyski A.: Poradnik balneotechnika 		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	15	
2. Participation in the project activities	15	
3. Participation in tutorials	15	
4. Participation in consultations related to the implementation of the project and tutorials	20	
5. Implementation of project activities	15	
6. Preparation for the final test of tutorials	15	
7. Absence from completing the exercise and defense of the project	5	
Student's workload		
Source of workload	hours	ECTS
Total workload	100	4
Contact hours	70	3
Practical activities	50	2