



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Sanitary and fire instalation systems [N1IŚrod1>ISiP]

### Course

Field of study

Environmental Engineering

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

polish

Form of study

part-time

Requirements

compulsory

### Number of hours

Lecture

20

Laboratory classes

0

Other (e.g. online)

0

Tutorials

10

Projects/seminars

20

### Number of credit points

5,00

### Coordinators

dr inż. Przemysław Muszyński

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### Lecturers

### Prerequisites

1.Knowledge: Basic knowledge of fluid mechanics. 2.Skills : Application of basic laws and relationships in the field of fluid and gas mechanics 3.Social competencies: Awareness of the need to constantly update and supplement knowledge and skills.

### Course objective

The acquisition by the students basic knowledge, skills in designing plumbing and fire protection systems.

### Course-related learning outcomes

Knowledge:

1. The student knows the basic concepts of water supply systems.
2. The student has knowledge of the operation and construction of water supply systems.
3. The student knows the possible solutions to water supply systems.
4. The student has the knowledge to determine the required pressure for water supply systems.
5. The student has knowledge of hydraulic calculations install hot and cold water and circulation pipe.
6. The student has knowledge of the construction of the water supply connection and selection of water meters.

7. The student knows the principles of operation of devices booster.
8. The student knows the rules of dimensioning hot and cold water.
9. The student has knowledge of the equipment for the preparation of hot water.
10. The student has knowledge of the operation of the system of circulation - gravity and forced.
11. The student has knowledge of the used materials (pipes and fittings) in sanitary systems.
12. The student has knowledge of solutions and technologies used in sanitary systems.
13. The student has the knowledge for determining the demand for water.
14. The student has the knowledge to carry out the selection of system components water and sewage.
15. The student has the see of the functioning and construction of fire protection systems.
16. The student has the see of the functioning and construction of sewage systems.
17. The student has knowledge of hydraulic calculations sewage systems.
18. The student knows the rules of dimensioning sewage systems.
19. The student understands the functioning of the local wastewater treatment facilities.

#### Skills:

1. The student is able to perform hydraulic calculations hot and cold water.
2. The student can choose the components of hot and cold water.
3. The student is able to perform calculations sewage system.
4. The student can choose the components of the sewage system.
5. The student is able to design a water supply connection and select water meter.
6. The student is able to design a sewer connection.
7. The student is able to design the fire protection system.
8. The student is able to design the installation of sewage from a local wastewater treatment.

#### Social competences:

1. The student understands the need for teamwork in solving theoretical and practical problems.
2. The student sees the need for systematic deepening and extending their competence.
3. The student is aware of the social role of technical university graduate.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

#### Lectures:

- a written final exam test students' knowledge.
- pass - 50% points.

#### Projects;

- assessment of the correctness of the project,
- assessment of knowledge of the scope of the project,
- continuous assessment of the students (rewarding students activity).
- pass - 50% points

#### Tutorials:

- continuous assessment of the students (rewarding students activity).
- pass - 50%

### Programme content

1. Basic concepts of water supply systems. (lecture)
2. Division of water supply systems (cold , hot, circulation water systems). (lecture, project)
3. Water demand standards, water supply design standards. (lecture, project)
- 4 Construction of water supply systems (components of the system). (lecture)
5. Water supply system layout solutions. (lecture)
- 6 Definition and calculation of the required pressure of a water supply system. (lecture, tutorials)
7. Hydraulic calculations of water supply systems. (lecture, project, tutorials)
8. Calculation example for determining design flows in cold and hot water systems. (tutorials)
9. Calculation example for the design of a cold and hot water system for an example multi-family building. (tutorials)
10. Circulation system - gravity and forced; principles of circulation design. (lecture, project)
11. Calculation example for heat loss determination and hot water installation. (tutorials)
12. Calculation example for the design of return lines in a circulating system including selection of control valves (tutorials)

13. Division of equipment for hot water preparation. (lecture)
- 14 Water supply connection and domestic and residential water meters. (lecture)
- 15 Construction, principle of operation and application of hydrophore equipment. (lecture)
16. Operation of pump systems connected in series and parallel. (lecture)
17. Design of fire protection systems. (lecture)
18. Basic concepts of plumbing systems. (lecture)
19. Division of sewage systems (domestic and rainwater; systems according to standard). (lecture)
20. Sewage systems design standards. (lecture, project)
21. Construction of sewage systems (system components). (lecture, project)
22. Sewage systems calculations. (project)
23. Calculation example of designing a sewerage system for an exemplary multi-family building. (tutorials)
24. local sewage treatment in non-urbanised areas. (lecture)
25. Materials, solutions and technologies used in sanitary installations. (lecture)
26. Methods of selecting components for plumbing and hot water systems. (lecture)

## Teaching methods

- lecture: informative (conventional).
- projects: using various sources of knowledge, classic problem method, project method.
- tutorials: using various sources of knowledge, classic problem method, auditory method.

## Bibliography

Basic:

1. Chudzicki J., Sosnowski S.: Instalacje wodociągowe - projektowanie, wykonanie, eksploatacja. Warszawa 2009. Wydanie II poprawione i uzupełnione. Wyd. Seidel-Przywecki Sp. z o.o.
2. Chudzicki J., Sosnowski S.: Instalacje kanalizacyjne - projektowanie, wykonanie, eksploatacja. Warszawa 2009. Wydanie II poprawione i uzupełnione. Wyd. Seidel-Przywecki Sp. z o.o.
3. Chudzicki J.: Instalacje ciepłej wody w budynkach. Warszawa 2006. Wydanie I. Biblioteka Fundacji Poszanowania Energii. Wyd. Fundacja Poszanowania Energii.
4. Jędral W.: Pompy wirowe. Warszawa 2001. Wydanie I. Wydawnictwo Naukowe PWN.
5. Lindner J., Struś W.: Przeciwożarowe urządzenia i instalacje wodne. Warszawa 1977. Wydanie II uzupełnione. Arkady.

Additional:

1. Sosnowski S., Tabernacki J., Chudzicki J.: Instalacje wodociągowe i kanalizacyjne. Warszawa 2000. Wydanie I. Wyd. Instalator Polski.
2. Chybowski B.: Instalacje ciepłej wody użytkowej. Warszawa 1973. Wydanie I. Arkady.8. Żuchowicki W.: Zaopatrzenie w wodę

## Breakdown of average student's workload

	Hours	ECTS
Total workload	125	5,00
Classes requiring direct contact with the teacher	50	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	75	3,00