



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Chemicals substances in the work environment

### Course

Field of study

Year/Semester

Safety Engineering

3/6

Area of study (specialization)

Profile of study

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general academic

Level of study

Course offered in

First-cycle studies

Polish

Form of study

Requirements

part-time

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

10

0

0

Tutorials

Projects/seminars

10

8

### Number of credit points

3

### Lecturers

Responsible for the course/lecturer:

Responsible for the course/lecturer:

Adam Górny, Ph.D., Eng.

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### Prerequisites

The student has a basic knowledge of chemistry, allowing to identify mixtures and chemical substances occurring in the human environment. The student is aware of the necessity, role and importance of using chemicals in the environment and the occurrence of related risks, including hazards to the environment.

### Course objective

Acquiring the ability to realize the possibilities (organizational and technical) of human functioning in an environment in which chemicals occur naturally or are used.

### Course-related learning outcomes

Knowledge

- knows the requirements for the implementation of engineering issues in the field of chemistry and manufacturing technology related to the use of chemicals,

- knows the issues related to hazards and their effects, risk assessment in the work environment and occupational accidents and diseases, in particular those related to the use of chemicals,



### Skills

- is able to properly select sources and information derived from them, carry out assessments and critical analyzes and synthesis of information held and, on this basis, formulate conclusions and comprehensively justify the adopted opinions,
- is able to conduct a critical analysis of the functioning of any entity and assess existing technical solutions, in particular devices, objects, systems, processes and services related to the use of chemical substances,
- is able to identify changes in requirements, standards and regulations caused by technical progress and indicate the need to supplement his knowledge,

### Social competences

- is aware of the knowledge importance in solving problems in the field of security engineering and to ensure of continuous improvement,
- is aware of the need to take into account non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

#### Formative assessment:

- in the scope of tutorials: on the basis of reports on independently performed tasks,
- in the scope of project classes: based on the progress of work on the project,
- in the scope of lectures: based on oral and written answers to questions covering issues discussed in the current and previous lectures.

#### Summative rating:

- in the scope of tutorials: average grade of partial grades for submitted reports, colloquium to check knowledge,
- in the scope of project classes: assessment of the completed project task,
- in the scope of lecture classes: passing in the form of a test (written work) in which at least one answer is correct (the answer is scored as 0 or 1), or written answers to open questions (answers are scored on a scale of 0 to 3); the student receives credit after obtaining at least 51% of the points available.

### Programme content

Chemical substances and mixtures as part of the material work environment. Characteristics of chemical substances and mixtures. Harmful dusts in the work environment. Safety Data Sheets. Classification of chemical substances and mixtures and types of related harmfulness. Criteria for assessing exposure levels. Monitoring of the working environment (including biological monitoring). Safety assessment and rules for carrying out work with hazardous substances and chemical mixtures. Labeling of hazardous substances and mixtures. Road (ADR), rail (RID), Aviation (ICAO) and the sea (IMDG) chemicals transport. The use of collective protection measures dedicated to the types of hazards.



## Teaching methods

Lecture classes are conducted in the form of an informational lecture supported by a multimedia presentation.

Tutorials are conducted using the case method, based on solving practical examples (tasks). During the exercises, a round table discussion takes place. Preparation for tutorials requires student's independent work, including work with a book.

Project classes are conducted on the basis of case studies with the use of scoring (graded) discussion; students work (carry out tasks) in predetermined groups. Project classes require an independent (in consultation with the teacher) solution of the problem (i.e. assessment of the technical solution used and indication of the necessary changes).

## Bibliography

### Basic

1. Nowacka W. Ł. (2011), Zagrożenia człowieka w środowisku pracy. Zagrożenia chemiczne, biologiczne i pyłowe, Politechnika Warszawska, Warszawa.
2. Uzarczyk A. (2009), Czynniki szkodliwe i uciążliwe w środowisku pracy, Wydawnictwo ODDK, Gdańsk.
3. (praca zbiorowa) (2008), Czynniki chemiczne w środowisku pracy, Wydawnictwo CIOP - PIB, Warszawa.

### Additional

1. Bryła R. (2011), Bezpieczeństwo i higiena pracy, Wydawnictwo ELAMED, Katowice.
2. Legal regulations regarding the use and classification of chemical substances and mixtures in the work environment.
3. Legal regulations regarding the transport of hazardous substances (ADR, RID, ICAO, IMDG).

## Breakdown of average student's workload

	Hours	ECTS
Total workload	58	3,0
Classes requiring direct contact with the teacher	28	1,5
Student's own work (literature studies, preparation for exercises and project classes, preparation of reports on independent work, preparation for tests, preparation of a project task) <sup>1</sup>	30	1,5

<sup>1</sup> delete or add other activities as appropriate