COURSE DESCRIPTION CARD - SYLLABUS

Course name
Safety of industrial processes [S2Bioinf1>BPP]

Course

Field of study
Bioinformatics

Year/Semester
1/1

Area of study (specialization)
–

Profile of study
general academic

Level of study
second-cycle

Course offered in
polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes
0

Other (e.g. online)
0

Tutorials
15

Projects/seminars
0

Number of credit points

2,00

Coordinators

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Lecturers

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Prerequisites

Student knows basics of algebra and probability theory as well as the basics of industrial processes and operations biotechnology.

Course objective

The aim of the course is to familiarize students with the basic principles and methods of process risk analysis taking into account fire, explosion, chemical and biochemical risks.

Course-related learning outcomes

Knowledge:
1. Student knows the legal basis of process safety according to the Polish and the European Union laws. [K_W13]
2. Student knows the basic threats that may result from the substances used in the industrial processes. [K_W02]
3. Student knows the basic principles of identifying hazards related to the industrial processes [K_W14]
4. Student knows the basic aspects related to the selection and location of basic industrial equipment and fittings. [K_W02]

5. Student knows the general issues affecting the management of process safety and their possible impact on business. [K_W15]

Skills:
1. Student is able to effectively use the material safety data sheets of chemical substances in order to identify the process hazards. [K_U01]
2. Student is able to identify the main steps of hazard identification in the process industry. [K_U18]
3. Student is able to use the basic methods of hazards identification, working both individually and in group. [K_U18]

Social competences:
1. Student knows the limitations of her/his own knowledge and understands the need for continuous education and improving her/his professional competences, with particular emphasis on current analyzes of industrial accidents. [K_K01]
2. Student is aware and understands of social aspects of the practical application of the acquired knowledge and skills in the field of process safety and the related responsibility. [K_K06]
3. Student is aware of the need for professional and reliable process risk analysis, especially fire and explosion risk. [K_K06]
4. Student is aware of the advantages and limitations of individual and group work in solving interdisciplinary problems in industry. Is aware of the responsibility for jointly performed tasks as part of teamwork. [K_K02], [K_K03]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:
Knowledge and skills acquired during the lectures are verified in a test with open and closed questions.
Knowledge and skills acquired during the classes are verified by completing a task in a group of at least 3 students. The results of the groups' work are presented.

Programme content

The course covers:
1. Selected aspects of industrial fittings and apparatus in the context of process flow diagrams (PFD) and piping and instrumentation diagrams (P&ID).
2. Basic terminology related to the process safety.
3. Principles of process safety management.
4. Legal bases related to fire protection and the ATEX directive.
5. Methods of identification and analysis of industrial hazards (HAZOP (Hazard and Operability study), FTA (Fault Tree Analysis), ETA (Event Tree Analysis).
6. Analysis of selected industrial accidents.

Teaching methods

Multimedia presentation, materials made available in the university's e-Learning system.

Bibliography

Basic
1. Markowski Adam S., Bezpieczeństwo procesów przemysłowych, 2017, Wydawnictwo Politechniki Łódzkiej, ISBN: 978-83-7283-805-6
2. Mitkowski P.T., Analiza ryzyka w przemyśle chemicznym, 2012, Wydawnictwo Politechniki Poznańskiej, ISBN: 978 - 83 - 7775 - 202 - 9
Additional
1. Crowl D. A., Louvar J. F., Chemical Process Safety. Fundamentals with Applications, Pearson Education INC, 2011.
2. Atherton J., Gil F., Hoboken, N.J,. Incidents that define process safety, Center for Chemical Process Safety, Wiley, 2008.
3. Guidelines for Process Safety Fundamentals in General Plant Operations, Center for Chemical Process Safety of the American Institute of Chemical Engineers, Nowy Jork, 1995 (electronic access via www.library.put.poznan.pl).

4. Sanders R. E., Chemical Process Safety - Learning from Case Histories (3rd Edition), Elsevier, 2005 (electronic access via www.library.put.poznan.pl)

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	0,50