

SUBJECT GUIDE

<u>Course name</u>	Safety of Process Installations
<u>Field of study</u>	Quality and Production Management
Form of studies	Full-time
Level of qualification	1st degree
<u>Year of studies</u>	IInd
<u>Semester</u>	IVnd
<u>Chair Unit</u>	Unit of Technical and Security Systems
Person preparing	Assoc. prof. Wioletta Bajdur PhD Jaroslaw Jasinski
<u>Profile</u>	General academic
Type of subject	Subject to choose
<u>Number of ECTS points</u>	4

Type of classes - number of hours in the semester

LECTURE	CLASSES	LABORATORY	PROJECT	SEMINAR
15	30	-	-	-

1. SUBJECT OBJECTIVE

- C1.** To acquaint students with the risks of processes related to industrial disasters and failures
- C2.** To familiarize students with the characteristics of various security elements related to the design and operation of process installations
- C3.** Providing students with practical knowledge in the field of security systems for increased and high risk plants

2. PRELIMINARY REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

- 1. The student knows the basic principles of health and safety at work and environmental protection.
- 2. The student has the basic ability to analyze cause and effect relationships in the range of interactions of various factors on the state of safety in the work process
- 3. The student knows the basic concepts related to occupational risk

3. EDUCATIONAL EFFECTS

- EK1** – The student knows the types of security measures used in process installations.
- EK2** – The student knows the technical and legal requirements regarding various security measures both in relation to machinery, equipment and process installations as well as infrastructure.
- EK3** – Student is able to analyze hazards related to process installations.
- EK4** – Student is able to choose prophylactic activities and appropriate security measures for typical process installations

4. SUBJECT CONTENT

Form of classes - LECTURES - 15 hours	Number of hours
W 1 - Introduction, basic concepts and terminology.	1
W 2, W3 – Current state of legal regulations concerning the prevention of serious industrial failures.	2
W 4 – Elements of process safety management	1
W 5 – Risk assessment and management, technological risk.	1
W 6, W 7 – Failure mechanisms. Most dangerous factors and substances that cause failures	2
W 8 – Factors that increase the risk and result in failure.	1
W 9 – Threats of serious industrial failures in Poland.	1
W 10, W 11 – The main elements of the system for preventing serious industrial accidents. Classification of plants due to the threat of failures.	2
W 12, W 13 – Increased and high risk of industrial failure - the main elements of the safety management system	2
W 14 – Process safety systems and principles of system design.	1
W 15 – Technical security measures in the prevention of failures	1
Form of classes - CLASSES - 30 hours	Number of hours
C1 – Introduction, basic concepts, organization of students' own work.	1
C2, C3 – Analysis of fire safety instructions. Fire and explosion hazards.	2
C4, C5 – Escape routes. Legal requirements, marking. Health and safety in buildings, fire protection.	2
C6, C7– Environmental Protection Law, scope, selected regulations and requirements	2
C8, C9 – Hazardous substances used in production processes.	2
C10, C11– Provisions regarding trans-border effects of industrial accidents	2
C12, C13, C14, C15, C16 – Risk management, standards, risk assessment methodologies.	5
C17, C18 - Ecological risk and process installations	2
C19, C20 – Factors deepening the effects of industrial failure	2
C21, C22, C23, C24, C25 – Analysis and assessment of the safety of plants belonging to groups of increased or high risk of a serious industrial accident.	5
C26, C27, C28, C29 – Analysis of exemplary reports on failures and their consequences in the industry aspect	4
C30 – Knowledge verification	1

5. TEACHING TOOLS

1. Manual
2. Legal acts and standards
3. CIOP studies and materials
4. Audio-visual equipment
5. Internet

6. ASSESSMENT METHODS (F – FORMATING, P – SUMMARY)

- F1. Active participation in classes
 F2. Evaluation of elaborations of selected topics
 P1. Check test

7. STUDENT WORK ASSESMENT

Form of activity		The average number of hours to complete the activity		
		[h]	ECTS	ECTS
Contact hours with Lecture guide	Lecture	18	0,72	1,4 0,68
Preparation for passing		15	20	
Contact hours with Lecture guide	Classes	15	0,6	1,36 0,76
Preparation for exercises		12	19	
Familiarization with the literature		13	15	0,6
Presence on consultations		5	13	0,52
TOTAL NUMBER OF HOURS / ECTS POINTS FOR SUBJECT		100	4	

8. BASIC AND SUPPLEMENTARY LITERATURE

Basic literature

1. Prevention of major industrial accidents – International Labour Office Geneva, 1991
2. Institution of Chemical Engineers (IChemE): Nomenclature for hazard and risk assessment in the process industries (Rugby, Warwickshire, 1985).
3. Safety in the installation and use of gas systems and appliances - Health and Safety Executive, Fourth edition 2013

Supplementary literature

1. Electrical installation guide – Schneider Electric S.A., March 2008
2. A Pratical Guide to Machinery Safety - PPMA – TÜV SÜD Product Service, Edition 4
3. Installations manuals (offshore, gas, electrical, chemical) – internet resources

9. SUBJECT LEADING (NAME AND SURNAME, E-MAIL ADDRESS)

Wioletta Bajdur - wiolawb@poczta.onet.pl

Jarosław Jasiński – jarjasinski@o2.pl

10. MATRIX OF THE IMPLEMENTATION OF THE EDUCATIONAL EFFECTS

Learning outcomes	Reference of a given effect to effects defined for the entire program (PEK)	Objectives of the course	Program content	Teaching tools	Assessment method
EK1 – The student knows the types of security measures used in process installations	K_W01, K_W02, K_W03, K_W08, K_W10, K_U01, K_U02, K_U04, K_U05, K_U10, K_K01, K_K02	C1, C3	W1, W4, W10, W11, W14, W15, C1-C3 C12-C16	1, 2,4,5	F1, F2, P1
EK2 – The student knows the technical and legal requirements regarding various	K_W01, K_W02, K_W03, K_W05, K_W08, K_W10, K_U01, K_U02, K_U04,	C2, C3	W1, W2, W4, W10 – W13, C1, C4-C11,	1, 2, 3,4	F1, P1

security measures both in relation to machinery, equipment and process installations as well as infrastructure	K_U05, K_U10, K_K01, K_K02		C30		
EK 3 - The student is able to analyze the risks associated with process installations	K_W01, K_W02, K_W03, K_U07, K_W08, K_W10, K_U01, K_U02, K_U04, K_U05, K_U09, K_U10, K_K01, K_K02	C2, C3	W1, W5, W6, W7-W9, W14, C17-C25, c30	1, 2, 3,4,5	F1, F2, P1
EK4 – Student is able to choose prophylactic activities and appropriate security measures for typical process installations	K_W01, K_W02, K_W03, K_W08, K_W10, K_U01, K_U02, K_U04, K_U05, K_U10, K_K01, K_K02	C1, C2, C3	W1-W3, W5, W10, W11, W14, W15 C21-C30	1, 2, 3, 4,5	F1, F2, P1

11. ASSESSMENT FORM – DETAILS

	Grade 2	Grade 3	Grade 4	Grade 5
Result 1	The student does not know the basic types of security measures used in process installations.	The student knows the basic types of security measures	The student knows the types of security measures, can divide into individual and collective protection	The student knows the types of security measures, including individual and collective protection measures. He can determine the role of organizational activities
Result 2	The student does not know the technical and legal requirements regarding various security measures both in relation to machinery, equipment and process installations as well as infrastructure.	The student knows the basic technical and legal requirements for typical security measures.	The student knows the technical and legal requirements regarding various security measures both in relation to machines, devices or installations as well as infrastructure.	The student knows the technical and legal requirements regarding various security measures both in terms of installation and infrastructure, and is able to analyze their correlation.
Result 3	The student can not analyze the hazards associated with process installations.	The student is able to analyze the threats. He knows some types of technical security measures	The student is able to analyze hazards in the aspect of choosing the right security measures.	The student is able to analyze hazards and select security measures. He can determine their relationship with organizational measures.

Result 4	The student can not choose preventive activities and appropriate security measures for typical process installations.	The student can propose appropriate security measures for typical process installations.	The student is able to choose the right security measures for typical process installations and point out the basic elements of prophylaxis	Student is able to choose prophylactic activities and appropriate security measures for the installation and knows the principles of cooperation with emergency services.
----------	---	--	---	---

12. OTHER USEFUL INFORMATION ABOUT THE SUBMISSION

1. Information on where to read the class presentations, laboratory instructions, etc. - necessary information is provided during the classes.
2. Information on the place where the classes take place - information is posted on the Faculty's website.
3. Information on the date of classes (day of the week / hour) - information is posted on the Faculty's website.
4. Information about consultations (hours + place) - information is provided at the first classes are also available on the Faculty's website and in the information display in the hall of the building at Al. Armii Krajowej 36 B (2nd floor).

.....

Signature of Subject Leader