STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Safety systems design		**1011102211011126438**

Field of study	Profile of study (general academic, practical)	Year /Semester
Safety Engineering - Full-time studies - Second-	**(brak)**	**1 / 1**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
Ergonomics and Work Safety	**Polish**	**obligatory**

Cycle of study:	Form of study (full-time,part-time)
Second-cycle studies	**full-time**

No. of hours				No. of credits
Lecture: **30**	Classes: **30**	Laboratory: **-**	Project/seminars: **15**	**5**

Status of the course in the study program (Basic, major, other)	(university-wide, from another field)
(brak)	**(brak)**

Education areas and fields of science and art	ECTS distribution (number and %)
technical sciences	**5 100%**
Technical sciences	**5 100%**

Responsible for subject / lecturer:

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Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Student defines and describes basic notions concerning management systems of occupational health and safety
2	**Skills**	Student can plan, organize and assess the functioning of management systems. Student can interpret the results of observation.
3	**Social competencies**	Student is aware of the meaning of management systems of occupational health and safety. Student is aware of the need to develop safety systems of subjects

Assumptions and objectives of the course:

Developing understanding of theoretical aspects and practical abilities of auditing management systems of occupational health and safety along with methodology of project management.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student has knowledge of safety systems, managing occupational health and safety, auditing auditing management systems of occupational health and safety - [K2A_W09]
2. Student knows the latest development trends and best practices in the framework of safety systems design - [K2A_W17]
3. Students knows basic methods, techniques, tools and materials used when tackling engineering tasks in relation to management systems design - [K2A_W21]

Skills:

1. Student can acquire, integrate, interpret data from literature, database or other properly matched sources, both in English or other foreign language accepted as an international language of communication within Safety Engineering, as well as to draw conclusions, formulate and justify opinions - [K2A_U1]

2. Student can apply various techniques in order to communicate in occupational environment and other environments - [K2A_U2]

3. Student can create, both in English and Polish language, a well- documented report of problems within Safety Engineering, which present the results of their own research - [K2A_U3]

4. Student can prepare and give oral presentation relating to detailed issues within the realm of Safety Engineering in Polish and other foreign language - [K2A_U4]

5. Student has self-study ability and comprehends it - [K2A_U5]

6. Student can apply information-communicative techniques to deal with tasks that are typical of engineering activity - [K2A_U7]

7. Student can, while formulating and solving engineering tasks, discern their systemic and non-technical aspects and also socio-technical, organizational and economic elements - [K2A_U10]

8. Student can come up with a suggestion how to make use of state-of-the art technology (techniques and technology) within products design - [K2A_U12]

9. Student has got the preparation that is indispensable to be able to work in an industrial environment and also knows safety rules connected with a given work along with the ability to impose their use in practice - [K2A_U13]

10. Student can conduct a critical analysis of the ways in which technical solutions function and assess, by means of Safety Engineering, the existing technical solutions, in particular machines, equipment, objects, systems, services and processes - [K2A_U15]

11. Student Student can suggest some improvements of already existing technical solutions that are typical of Safety Engineering - [K2A_U16]

12. Student can assess the utility of routine methods and tools that are designed for solving simple engineering tasks of practical nature, characteristic to the safety engineering, as well as choose and apply an appropriate method and tools and also use it effectively, bearing in mind non-technical aspects - [K2A_U17]

13. Student can, according to a given specification, design and operate simple equipment, object, system or a process, typical for Safety Engineering, wile using appropriate methods, techniques and tools, as well as solve complex engineering tasks, characteristic of Safety Engineering (including some uncommon ones which possess research component) - [K2A_U18]

14. Student can, according to the given specification, design and operate on a simple equipment, system or a process, which is typical of Safety Engineering, using appropriate and groundbreaking methods, techniques and tools - [K2A_U19]

Social competencies:

1. Student understands the need and knows means how to self-study (first, second and third cycle studies, postgraduate studies, qualification courses)- improving professional, personal and social competence; can argument the need to learn for the whole life - [K2A_K1]

2. Student is fully aware of the responsibility that he has taken for his own work and expresses readiness to comply with the rules of team work as well as responsibility for mutually realized and completed tasks - [K2A_K3]

3. Student can determine some causal relationships in the process of targets implementation and rank pertinence of alternative or competitive tasks - [K2A_K4]

Assessment methods of study outcomes

Formative assessment:

Classes: current/ongoing evaluation (2-5) of assigned tasks

Projects: current/ongoing evaluation of work progress on a given project

Lectures: evaluations based on questions relating to the presented materials during the current and previous lectures

Collective assessment:

Classes: average of partial exercises; credits given after achieving at least 3.0;

Projects: evaluation of the presented solution with reference to the chosen project; credits given after achieving at least 3.0;

Lectures: written exam (5 open questions with content presented during the lectures); each question is scored 2-5 points; final result is an average of partial grades; the exam pass equals at least 3.0

Course description

Rudiments of system approach to safety: safety and products safety management, system and its measures, structures and types, the culture of safety as a context of safety system. Models of selected safety management systems and their elements. Basic theory of project design, paradigms of design, system approach. Introduction to company management in terms of a project. The process of designing SMS (implementation, planning, project termination). Integration with other systems.

Basic bibliography:

1. Prussak W., Mrugalska B.: Projektowanie systemów bezpieczeństwa (Safety systems design), Wyd. Politechniki Poznańskiej, Poznań 2011.

Additional bibliography:

1. Cempel C.: Teoria i inżynieria systemów - zasady i zastosowania myślenia systemowego (Theory, rules and different applications of system thinking), Wyd. Naukowe Inst. Technologii Eksploatacji - PIB, Radom 2008.

2. Ficoń K.: Inżynieria zarządzania kryzysowego. Podejście systemowe (Crisis management engineering), BEL Studio, Warszawa 2007.

3. Koziej S., Wstęp do teorii i historii bezpieczeństwa (Introduction to the theory and history of safety) (skrypt internetowy http://www.koziej.pl/), Warszawa/Ursynów 2010.

4. Szymonik A., Organizacja i funkcjonowanie systemów bezpieczeństwa (Organization and functioning of safety systems), Difin, Warszawa 2011.

Result of average student's workload

Activity	Time (working hours)
1. participation in lecture	15
2. preparations for lecture credit	20
3. participation in classes	30
4. preparations for classes credit	20
5. project	15
6. preparation of the project	20

Student's workload

Source of workload	hours	ECTS
Total workload	135	5
Contact hours	75	3
Practical activities	45	2