POZNAN UNIVERSITY OF TECHNOLOGY

EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS)

pl. M. Skłodowskiej-Curie 5, 60-965 Poznań

COURSE DESCRIPTION CARD - SYLLABUS

Course name
Aviation risk management

Course

Field of study	Year/Semester
Aviation and cosmonautics	2/4
Area of study (specialization)	Profile of study
	general academic
Level of study	Course offered in
First-cycle studies	Polish
Form of study	Requirements
full-time	compulsory

Number of hours

Lecture	Laboratory classes	Other (e.g. online)
30	0	0
Tutorials	Projects/seminars	
15	0	

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

Adam Kadziński email:
adam.kadzinski@put.poznan.pl
tel. 61 665 2267

Responsible for the course/lecturer:

Prerequisites

Student understands the concept of a system and is able to identify social systems, industrial and transport systems. Student has basic knowledge of probability. Student has knowledge of reliability of technical facilities. Student is able to calculate the probabilities of elementary and complex events. Studnet is fluent in using computer programs such as MS Excel and MS Word. Student understands and accepts the necessity to introduce appropriate restrictions to social, industrial and transport systems, which most often lead to the improvement of safety of the functioning of these systems. Student knows how to manage the time available to perform the tasks indicated for the implementation.

Course objective

Getting to know the methods and acquiring practical skills in the field of risk management of hazards identified in selected areas of analysis related to transport, particularly in aviation

Course-related learning outcomes

Knowledge

Student has an orderly, theoretically founded general knowledge covering key safety issues. Student

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knows the basic and advanced methods, processes, procedures and models that make up the risk management that can be applied in the domains of transport and social systems, in particular in the domains of aviation. He or she knows stages of the aviation risk management process. He or she knows the rules of keeping reporting documentation on the risk management process in aviation. He or she has knowledge of IT solutions supporting risk management in aviation.

Skills

Student acquires the ability to recreate the algorithms for applying the risk management tools presented during the lectures. He ors he has the ability to plan aviation tasks in practice with the use of aviation management methods. He or she can keep documentation of the risk management process in selected types of aviation domains.

Social competences

Student is aware of the importance of the correct use of the methods, processes, procedures and models that make up the risk management engineering for the suitability of the analysis results obtained on their basis.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired during the lecture is verified on the basis of three written tests taking place respectively during the 8th (45 minutes), 10th (30 minutes) and last (45 minutes) lecture. Tests consist of 6-10 questions (closed and open-ended), with different scores. The pass mark is 50% of the sum of the maximum number of points to be obtained from all tests. The topics, on the basis of which the questions are developed, are provided in advance in an electronic version to the student representative. Completion of the content of the tutorials is carried out by combining the grades of the tasks performed during the tutorials and activity in the classroom, and on the basis of the written test result at the end of the cycle. The written test consists of 6-10 questions with different scores. The pass mark is 50% of the total maximum number of points that can be obtained during the entire course of tutorials.

Programme content

Lectures

Introduction to the subject matter. Program, hour structure, literature. Demand for safety analysis. The concept of a safety management system (SMS). Risk management as an element of SMS in transport, including aviation. Aviation risk management levels and types of risk. A method of managing risk. Identifying and presenting areas / domains of analyzes for risk risk management. The process of identifying hazards, risk sources, attributes of risk sources, grouping risk sources, formulating hazards, levels of possibilities and levels of hazrad activation effects, characterization of hazards, activation of hazards. Adverse and dangerous events. Scenarios of the development of dangerous events, Bow-Tie method. Risk models, generalized risk model, risk models in known methods of risk analysis, risk estimation. Risk estimation and evaluation and risk categories. Responding to the risk, dealing with risk, risk reduction measures - elements of safety systems, risk monitoring and risk communication. Principles of risk management within the organization and safety of aviation flights. Management of

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aviation technology operation, taking into account the requirements for risk management in the flight safety system of military and civil aviation. Risk sources and hazards to flight safety. Practical ways to eliminate or reduce risk in aviation activities. Principles of keeping reporting documentation on the process of risk risk assessment in aviation. IT systems supporting risk management in aviation.

Tutorials

Formulating and justifying assumptions regarding the area / domain of analyzes. Identification of hazard sources using the FTA method. Estimating the probability of hazard activation with the use of various types of source materials. Selection of the risk model and the limit values of individual risk areas. Preparation of a report documenting the conduct of the risk risk assessment process. Applications of the Bow-Tie method to build scenarios for the development of hazardous events in aviation - indicating the area / domain of analyzes, identifying Top Event, identifying groups of hazard sources, identifying consequences, risk reduction measures for groups of hazard sources, risk reduction measures for consequences, escalating factors, risk reduction measures for escalating factors, links between components of the scheme of the Bow-Tie method. Determining air incidents in military aviation, identification of hazards and indicating their sources based on the 5M Model. Broadcasting statistical codes to aviation events. Creating a risk model for the hazards arising from a specific aviation project Practical methods of influencing the risk in aviation. Development of a Risk Management Sheet and Risk Assessment Sheet from the perspective of an aircraft crew member.

Teaching methods

Lectures: with the use of multimedia presentations.

Tutorials: electronic presentations in the stages of formulating problems to be solved and presenting the final results, solving fragments of problems on the board by the teacher and / or students.

Bibliography

Basic

1. Augustyn E., Zarządzanie ryzykiem zagrożeń w systemie użytkowania samolotów lotnictwa taktycznego sił powietrznych. Rozprawa doktorska, Politechnika Poznańska, Poznań, 2019, niepublikowane, https://sin.put.poznan.pl/search/dissertations, Biblioteka Politechniki Poznańskiej.

2. Galant M., Ograniczanie ryzyka zagrożeń w lotnictwie ogólnym przez zastosowanie systemu monitorującego stan psychofizyczny pilota. Rozprawa doktorska, Politechnika Poznańska, Poznań, 2017, niepublikowane, https://sin.put.poznan.pl/search/dissertations, Biblioteka Politechniki Poznańskiej.

3. Gill A., Warstwowe modele systemów bezpieczeństwa do zastosowań w transporcie szynowym. Wyd. Politechniki Poznańskiej, Poznań, 2018.

4. Kadziński A., Zarządzanie ryzykiem zagrożeń na stanowiskach pracy. Rozdział 3 w: praca zbiorowa red. L. Lewicki, J. Sadłowska-Wrzesińska, Istotne aspekty BHP. Wydawnictwo Wyższej Szkoły Logistyki, Poznań 2014, s. 149÷195.

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5. Kadziński A., Gill A., Smoczyński P., Materiały seminarium nt. "Zrozumieć zarządzanie ryzykiem zagrożeń". Poznań, 2014-2020, niepublikowane.

6. Szrama S., Zarządzanie ryzykiem zagrożeń w systemie utrzymania samolotów wielozadaniowych F-16. Rozprawa doktorska, Politechnika Poznańska, Poznań, 2019, niepublikowane, https://sin.put.poznan.pl/search/dissertations, Biblioteka Politechniki Poznańskiej.

Additional

1. Klich E., Bezpieczeństwo lotów. Wyd. Naukowe Instytutu Technologii Eksploatacji - PIB, Radom, 2011.

2. Kobaszyńska-Twardowska A., Zarządzanie ryzykiem zagrożeń na przejazdach kolejowych. Rozprawa doktorska, Politechnika Poznańska, Poznań, 2017, niepublikowane, https://sin.put.poznan.pl/search/dissertations, Biblioteka Politechniki Poznańskiej.

3. Kosieradzka A., Zawiła-Niedźwiecki J., Zaawansowana metodyka oceny ryzyka w publicznym zarządzaniu kryzysowym. Wydawnictwo edu–Libri, Kraków-Legionowo 2016.

4. Skorupski J., Ilościowe metody analizy incydentów w ruchu lotniczym. Oficyna Wyd. Politechniki Warszawskiej, Warszawa, 2018.

5. Szymanek A., Teoria i metodologia zarządzania ryzykiem w ruchu drogowym. Wyd. Politechniki Radomskiej, Radom 2012.

6. Szymaniec K., Systemowe zarządzanie ryzykiem zagrożeń w lotnictwie transportowym. Rozprawa doktorska, Politechnika Poznańska, Poznań, 2017, niepublikowane, https://sin.put.poznan.pl/search/dissertations, Biblioteka Politechniki Poznańskiej.

Breakdown of average student's workload

	Hours	ECTS
Total workload	73	2,0
Classes requiring direct contact with the teacher	45	1,2
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	28	0,8

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[1] delete or add other activities as appropriate