COURSE DESCRIPTION CARD - SYLLABUS

Course name

Aviation safety systems

Course

Field of study

Aviation

Year/Semester

3/5

Area of study (specialization)

Safety of air transport

Profile of study

general academic

Level of study

First-cycle studies

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

Lecturers

Responsible for the course/lecturer:

dr hab. inż. Adrian Gill

email: adrian.gill@put.poznan.pl

tel. 61-6652267

Wydział Inżynierii Lądowej i Transportu

ul. Piotrowo 3, 60-965 Poznań

Responsible for the course/lecturer:

mgr inż. Marcin Sypniewski

email: marcin.sypniewski@put.poznan.pl

Prerequisites

Knowledge:Has knowledge of mathematics, physics and the basics of probability theory in the field presented during the studies.

Skills: he can apply the scientific method in solving research problems.

Social competences: can formulate questions precisely; is able to define priorities important in solving the tasks set before him; demonstrates independence in solving problems, gaining and improving the acquired knowledge and skills.

Course objective

Learning the methods and acquiring practical skills in modeling and analyzing the functioning of safety

systems, as well as learning the basic techniques of space surveillance and their impact on the levels of safety in aviation.

Course-related learning outcomes

Knowledge

Has knowledge of safety and risk management in aviation. The student knows the concept of the human factor and methods of assessing human reliability, has detailed knowledge related to selected issues in the field of capabilities and limitations of systems for air operations.

Skills

Is able to obtain information from various sources, including literature and databases, both in Polish and in English, integrate it properly, interpret and critically evaluate it, draw conclusions, and exhaustively justify opinions.

Social competences

correctly identifies and resolves dilemmas related to the profession of aerospace engineer.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Final tests

Programme content

Safety systems at the background of risk management methods. Basic concepts and definitions of safety system. Models of safety systems. Elements and procedures of creating models of safety systems: identification of safety functions, selection of risk reduction measures, hazards identification. Methods of analyzing the functioning of the safety systems. Examples of safety systems in air transport.

Classification of surveillance techniques and their impact on ensuring safety in aviation (division into primary and secondary radars, MLAT and ADSB / C systems) with highlighting the advantages and disadvantages of individual technologies).

Surveillance data flow chain (SUR) and methods of verifying the correctness of these data according to Eurocontrol chain, implementation of SASS-C, ASTERIX protocol and ARTAS tracker as examples of evolution in ensuring and improving techniques to ensure safety in aviation.

The development of surveillance techniques and their impact on the development of aviation safety, the evolution of air traffic control systems, the evolution of aircraft equipment (aircraft avionics, installed devices and on-board systems).

Teaching methods

Informative lecture (conventional).

Bibliography

Basic

1. Cempel C., Teoria i inżynieria systemów. Wyd. Instytutu Technologii Eksploatacji - PIB, Radom 2006

2. Center for Chemical Process Safety. (2001). Layer of Protection Analysis - Simplified Process Risk Assessment. Center for Chemical Process Safety/AIChE

3. Gill, A., Warstwowe modele systemów bezpieczeństwa do zastosowań w transporcie szynowym [Layered models of safety systems for rail transport applications]. Wydawnictwo Politechniki Poznańskiej, Poznań, 2018.

4. Harms-Ringdahl, L. Guide to safety analysis for accident prevention, IRS Riskhantering AB, Stockholm, Sweden 2013, www.irisk.se/sabook

5. Jaźwiński J., Ważyńska-Fiok K., Bezpieczeństwo systemów. Wyd. Naukowe PWN, Warszawa, 1993

6. Kadziński A., Studium wybranych aspektów niezawodności systemów oraz obiektów pojazdów szynowych. Wyd. Politechniki Poznańskiej, seria Rozprawy, nr 511, Poznań 2013

7. Szymanek A., Bezpieczeństwo i ryzyko w technice. Wyd. Politechniki Radomskiej, Radom 2006

8. Szymonik A., Organizacja i funkcjonowanie systemów bezpieczeństwa. Zarządzanie bezpieczeństwem, Difin SA, Warszawa 2011

9. Zintegrowany System Bezpieczeństwem Transportu. Tom 1 i 2. Redaktor pracy zbiorowej Krystek R., Politechnika Gdańska, Gdańsk 2009, WKŁ, Warszawa 2009.

10. Marian R. Sztarski, Radary, Wydawnictwo Ministerstwa Obrony, Warszawa 1981.

11. Zbigniew Czekała, Parada radarów. Wydawnictwo Bellona, Warszawa 1999-2014.

Additional

1. Analiza ryzyka w transporcie i przemyśle, pod redakcją Marka Młyńczaka, Navigator 6, Oficyna Wydawnicza Politechniki Wrocławskiej, Wrocław 1997

2. Bezpieczeństwo pracy i ergonomia, część 1 i 2, pod redakcją Danuty Koradeckiej, Wyd. Centralnego Instytutu Ochrony Pracy, Warszawa 1999

3. Najmiec A., Widerszal-Bazyl M., Stres w pracy mechaników lotniczych, Zawody trudne i niebezpieczne, Bezpieczeństwo pracy nr 11/2006

4. Pihowicz W., Inżynieria bezpieczeństwa technicznego. Wydawnictwa Naukowo- Techniczne, Warszawa 2008

5. Terelak J.F., Człowiek i stres. Oficyna Wydawnicza BRANTA, Bydgoszcz-Warszawa 2008.

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	30	1,5
Student's own work (literature studies, preparation for classes, preparation for tests,)[1]	20	0,5

[1] delete or add other activities as appropriate