



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Air Traffic

Course

Field of study

Aerospace Engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

1/2

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

30

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

15

Number of credit points

4

Lecturers

Responsible for the course/lecturer:

Artur Kinowski

Responsible for the course/lecturer:

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Polish Air Navigation Services Agency

ul. Wieżowa 8 02-147 Warszawa

Prerequisites

Knowledge: The student has a basic knowledge of air transport, knowledge about the management and organization of transport processes

Skills: The student is able to associate and integrate the obtained information, analyze phenomena in the environment, draw conclusions, formulate and justify opinions

Social competences: The student is able to independently search for information in the literature and knows the rules of discussion; ability to formulate a research problem and search for its solution, independence in problem-solving, ability to cooperate in a group

Course objective

Getting to know the specificity of the functioning of air transport. Discussion of the structure and



division of the airspace, the rules of flights and institutions related to the organization of air traffic (in particular the Polish Air Navigation Services Agency)

Course-related learning outcomes

Knowledge

1. Has extended knowledge necessary to understand the profiled subjects as well as specialist knowledge on construction, operation, air traffic management, safety systems, economic, social and environmental impact in the field of aviation and space [K1A_W01]
2. Has detailed knowledge related to selected issues in the field of ground handling of aircraft and propulsion systems, including logistics aspects [K2A_W19]
3. Has detailed and structured knowledge in the field of the use of air technical facilities for the transport of people, goods, dangerous goods, as well as in the management of air operations and airports [K2A_W23]
4. Has basic knowledge of law, in particular civil aviation law, copyright and industrial property law and its influence on the development of technology, can use patent information [K2A_W25]

Skills

1. Can communicate with the use of various techniques in the professional environment and other environments, using the formal notation of the structure, technical drawing, concepts and definitions of the scope of the studied field of study [K2A_U02]
2. Has the ability to self-educate with the use of modern didactic tools, such as remote lectures, websites and databases, didactic programs, electronic books [K2A_U03]
3. Can prepare and present a short verbal and multimedia presentation devoted to the results of an engineering task [K2A_U08]

Social competences

1. Understands the need for lifelong learning; can inspire and organize the learning process of other people [K1A_K01]
2. Is ready to critically evaluate the knowledge and content received, recognize the importance of knowledge in solving cognitive and practical problems, and consult experts in the event of difficulties in solving the problem on its own [K1A_K02]
3. Is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the related responsibility for decisions [K2A_K03]
4. Is aware of the social role of a technical university graduate, and especially understands the need to formulate and transmit to the society, in particular through the mass media, information and opinions on technological achievements and other aspects of engineering activities; makes efforts to provide such information and opinions in a generally comprehensible manner [K1A_K08]



Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

LECTURE: written test of the content processed in class

TUTORIALS: final test

PROJECT: Development of own flight route, preparation of a flight plan, selection of airports, aircraft, basic calculations

Programme content

1. The International Civil Aviation Organization ICAO and other aviation organizations (Eurocontrol, EASA, PANSA, CAA). Conventions organizing air navigation. Historical conditions of aviation law and the structure of its functioning.
2. Division of the Polish Airspace. Flexible Airspace Management (FUA). Airspace Use Plan (AUP). Strategic, Pre-tactical and Tactical Space Management (ASM-1, ASM-2 and ASM-3).
3. Meteorological service for international air navigation (ICAO Annex 3): discussion of the importance of weather in aviation, basic weather reports, METAR, SNOWTAM, TAF, GAMET. Coding and decoding of messages.
4. Aeronautical charts (ICAO Annex 4): responsibilities, basic types of charts and projections. Overview of the basic units of measurement to be used during air and ground operations in aviation (ICAO Annex 5): relationships between units, the origin of their use.
5. Air traffic services (ICAO Annex 11) and Aeronautical Information Services (ICAO Annex 15). Overview of goals and differences. Overview of air traffic control services, analysis of air traffic in uncontrolled (FIS) and controlled (ATC) airspace.
6. Flight preparation, mass and balance. Differences in calculating parameters for general and commercial aviation. Minima VFR, IFR. The essence of General Aviation (GA) and Commercial Aviation (CAT)
7. Air communications (ICAO Annex 10). Radio navigation aids, Telecommunications procedures, Communication systems, Surveillance and collision avoidance systems and the use of the aviation radio frequency range.
8. ASAR service. Search and rescue (ICAO Annex 12) and Aircraft Accident and Incident Investigation (ICAO Annex 13). Overview of the scope, procedures and responsibilities
9. ATFCM traffic flow management
10. Airspace management - FUA - AFUA, FRA, new surveillance techniques, air traffic management systems (AMS2000, PEGASUS)



11. Modern aircraft positioning systems in RNAV, multilateration in ATM, automatic ADS-B supervision in ATM
12. New trends in air traffic management in Europe FUA → SES → SESAR → SESAR II
13. FUA / FRA in a controlled space
14. Surveillance techniques: VOR, DME, ILS, MLS, GPS NAVSTAR and GLONASS, LAAS (GBAS), EGNOS in ATM, navigation based on PNP RNAV characteristics in ATM.

Teaching methods

Informative (conventional) lecture (providing information in a structured way) - may be of a course (introductory) or monographic (specialist) character

The exercise method (subject exercises, practice exercises) - in the form of auditorium exercises (application of acquired knowledge in practice - may take various forms: solving cognitive tasks or training psychomotor skills; transforming a conscious activity into a habit through repetition)

Project method (individual or team implementation of a large, multi-stage cognitive or practical task, the effect of which is the creation of a work)

Bibliography

Basic

1. Szutowski L., Poradnik pilota samolotowego, Poznań 2007
2. Compa T., Zarządzanie przestrzenią powietrzną, AON, Warszawa 2003
3. Domicz J., Szutowski L., Podręcznik pilota samolotowego, Poznań 2008
4. Laskowski R., Osiągi, wyważenie i planowanie lotu, Szkolenie samolotowe EASA, Żółwin, 2014

Additional

1. Zarządzanie ruchem lotniczym w przestrzeni powietrznej RP, WLOP, Warszawa 2002.
2. Ustawa Prawo Lotnicze

Breakdown of average student's workload

	Hours	ECTS
Total workload	100	4,0
Classes requiring direct contact with the teacher	65	3,0
Student's own work (literature studies, preparation for classes, preparation for tests (exercises) and credits (lecture) ¹	35	1,0

¹ delete or add other activities as appropriate