COURSE DESCRIPTION CARD - SYLLABUS

Course name

Aviation simulation tools

Course

Field of study

Aerospace Engineering

Year/Semester

3/5

Area of study (specialization)

-

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish

Form of study

part-time

Requirements

elective

Number of hours

Lecture

36

Laboratory classes

18

Other (e.g. online)

0

Tutorials

18

Projects/seminars

0

Number of credit points

9

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

Prerequisites

Knowledge: In mathematics, physics and technical mechanics in the field presented during the studies.

Skills: Can apply the scientific method in solving problems, carrying out experiments and making conclusions

Social competences: Knows the limitations of own knowledge and skills; can precisely formulate questions, understand the need for further education

Course objective

Familiarization and learning to use simulation tools used in aviation

Course-related learning outcomes

Knowledge

1. has extended knowledge necessary to understand the profile subjects as well as specialist knowledge about the construction, operation, air traffic management, safety systems, economic, social and environmental impact in the field of aviation and aerospace [K2A_W01]

2. Has ordered, theoretically founded knowledge in the field of aircraft traffic analysis, calculations and simulations using specialized software or tools created independently [K2A_W06]

3. Has ordered and theoretically founded knowledge of computer-aided manufacturing methods and their application in industry [K2A_W13]

Skills

1. can use the following languages: native and international to a degree enabling the understanding of technical texts and writing technical descriptions of machines in the field of aviation and aerospace using dictionaries (knowledge of technical terminology) [K2A_U01]

2. is able to communicate with the use of various techniques in the professional environment and other environments, using the formal notation of the construction, technical drawing, concepts and definitions of the scope of the field of study [K2A_U02]

3. can draw a diagram and a complex machine element in accordance with the rules of a technical drawing, can create a system diagram, select elements and perform basic calculations of the electrical and electronic system of machines or aviation and space devices [K2A_U06]

4. can use one additional foreign language in verbal communication at the level of everyday language, can describe issues related to the field of study in this language, can prepare technical descriptive and drawing documentation of an engineering, transport and / or logistic task [K2A_U07]

5. is able to organize and substantially manage the process of designing and operating an on-board device, machine or technical flying object from the group covered by the selected specialization [K2A_U15]

6. is able to assess the usefulness and use the tools integrated with the spatial modeling packages, and correctly interpret their results [K2A_U17]

Social competences

1. understands the need for lifelong learning; can inspire and organize the learning process of other people [K2A_K01]

2. Is ready to critically assess the possessed knowledge and received content, recognize the importance of knowledge in solving cognitive and practical problems and consult experts in the event of difficulties with solving the problem independently [K2A_K02]

3. is able to cooperate and work in a group, assuming different roles in it [K2A_K04]

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 commonly understandable manner [K2A_K08]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: written exam

Laboratory: credit based on the average of the marks in theoretical preparation for classes and reports

Classes: final test

Programme content

Modeling of emissions in airport areas. EMDS Tool - used to assess the impact on air quality of airport emission sources, in particular aviation sources, which include: Airplane, Auxiliary power units, Ground handling equipment, Ground vehicles, Stationary sources Performing flights in a simulator environment - Simulations of changes in flight parameters, aircraft behavior depending on weather conditions, simulator environment, and human behavior. Flow and structural analyzes: analytical design of the geometry of flow engine elements, creation of geometric models (CAD) tailored to the needs of CAE systems, basics of using CAE systems to perform flow analyzes, basics of using CAE systems to perform structural analyzes.

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)

Laboratory (experiment) method (students independently conduct experiments)

Bibliography

Basic

1. Bartnik R., Grenda B., Galej P., Flight simulators and air traffic control simulators in aviation training, Wyd. National Defense University, Warsaw, 2014

2. Lozia Z .:? Driving simulators ?, WKŁ, Warsaw 2008

3. Leski J., Simulation and simulators, Wyd. MON, Warsaw, 1971

4. Szczepański C., Flight simulators, Wyd. Of the Warsaw University of Technology, 1990

5. Zagdański Z .: Emergency states of aircraft, Wyd. ITWL, Warsaw, 1995

6. Kearns S., Marvin T., Hodge S .: Competency-Based Education in Aviation: Exploring Alternate Training Pathways, 2016

7. J. M. Rolfe, K. J. Staples: Flight Simulation

8. Peter A. Hancock, Dennis A. Vincenzi, John A. Wise, Mustapha Mouloua: Human Factors in Simulation and Training

9. Lewitowicz J., Kustroń K., Basics of aircraft operation, Aircraft properties and operating properties, Wyd. ITWL, Warsaw, 2003

Additional

1.Makarowski R., Smolicz T., Human factor in aviation operations, ADRIANA AVIATION, Kosowizna, 2012

2. Lewitowicz J., Kustroń K., Fundamentals of aircraft operation, Aircraft properties and operating properties, Ed. ITWL, Warsaw, 2003

3. Lewitowicz J. (ed.) Fundamentals of Aircraft Operation, Aircraft Operation Research, Wyd. ITWL, Warsaw, 2007

Breakdown of average student's workload

	Hours	ECTS
Total workload	225	9,0
Classes requiring direct contact with the teacher	75	4,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation)[1]	150	5,0

[1] delete or add other activities as appropriate