COURSE DESCRIPTION CARD - SYLLABUS

Course name
Navigation

Course

Field of study	Year/Semester
Aviation	1/2
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)
15		
Tutorials	Projects/seminars	
15		

Number of credit points

2

Lecturers

Responsible for the course/lecturer:	Responsible for the course/lecturer:
mgr Marta Nowinowska	Paweł Kowalczyk
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Prerequisites

The student starting this subject should have basic knowledge of basic knowledge about the shape of the Earth, coordinate systems and reference as well as the basics of radio navigation. He should also have the ability to apply the scientific method in solving problems and be ready to cooperate within a team.

Course objective

To acquaint the student with the practical performance of navigation tasks related to the planning, preparation and execution of a flight in selected environmental and operational conditions, change of time, use of typical navigation and radio navigation devices, use of radar devices, interpretation of measurement results, assessment of correctness of functioning and estimation of navigation and radio navigation equipment errors . Ability to use satellite system receivers used in navigation, interpretation

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of indications and assessment of the possibility of using satellite systems in particular types and phases of navigation, use of navigation methods in professional air operations. The ability to put into practice calculations of grouping parameters.

Course-related learning outcomes

Knowledge

1. has basic knowledge of the vocabulary used in English to describe mathematical operations and the data presented in the diagram / graph. Has knowledge of formulating a text in English explaining / describing a selected specialist issue, has basic knowledge of the vocabulary used in English to describe the technological support of air communication, flight control systems, safety procedures at the airport related to the presence of animals, aircraft control surfaces, maneuvers performed by plane

2. has a basic knowledge of the mechanisms and laws governing human behavior and psyche

Skills

1. is able to properly use information and communication techniques, applicable at various stages of the implementation of aviation projects

2. is able to organize, cooperate and work in a group, assuming various roles in it, and is able to properly define priorities for the implementation of a task set by himself or others

Social competences

1. is aware of the importance of knowledge in solving engineering problems and knows examples and understands the causes of faulty engineering projects that have led to serious financial and social losses, or to a serious loss of health and even life

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture:

- assessment of knowledge and skills demonstrated on the written test - 1.5 hour

exercises:

The knowledge acquired as part of the exercises is verified by two 45-minute colloquia carried out during 3 and 7 classes

Programme content

Lecture:

Basic of navigation: the Earth, Earth rotation, direction, track, distance, units, graticule distances, speed. Gradient versus rate of climb/descent. Triangle of velocities (TOV). Flight log.

exercises:

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WGS-84 ellipsoid. Air mile. True airspeed (TAS), mach number (M). CAS/TAS/M relationship. Ground speed (GS). Contrutions and solutions the triangle of velocities (TOV).

Teaching methods

1. Lecture: multimedia presentation, illustrated with examples given on the board.

2. Exercises: examples given on the board and performance of tasks given by the teacher - practical exercises.

Bibliography

Basic

1.   Narkiewicz J., Podstawy układów nawigacyjnych, PWN, Warszawa 1999 r.

2.   Ortyl A., Autonomiczne systemy nawigacji lotniczej, WAT, Warszawa 2000 r.

3.   Janik F., Malinowski C., Podstawowa nawigacja lotnicza, Wydawnictwa komunikacyjne, Warszawa 1957 r.

4.   Wyrozumski W., Podręcznik nawigacji lotniczej, Aeroklub PRL,

6.   Wolper James S., Understanding mathematics for aircraft navigation, McGraw-Hill Companies Inc, 2001 r.

7.   Narkiewicz J., Globalny system pozycyjny. WKiŁ 2003 r.

8.   Advanced Avionics Handbook FAA-H-8083-6, Federal Aviation Administration. Washington 2009 r.

Additional

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 exercises, preparation for colloquium, preparation for passing) [1]	20	0,5

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[1] delete or add other activities as appropriate