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

Navigation

Course

Field of study	Year/Semester
Aviation and astronautics	1/1
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:

Paweł Kowalczyk

Wydział Inżynierii Środowiska i Energetyki

email: ppkowalczyk@wp.pl

tel. +48 534 681 212

Responsible for the course/lecturer:

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 of indications and assessment of the possibility of using satellite systems in particular types and phases

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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 detailed knowledge related to selected issues in the field of navigation and piloting techniques, and the use of flight simulators

Skills

1. knows how to use native and international languages to the extent that it is possible to understand technical texts and to write using technical dictionaries machine descriptions in the field of aviation and astronautics (knowledge of technical terminology)

2. is able to apply basic technical standards regarding unification and safety as well as recycling

3. can draw a diagram and a simple machine element in accordance with the principles of technical drawing

Social competences

1. is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment, and the associated responsibility for the decisions taken

2. can interact and work in a group, taking on different roles in it

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:

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).

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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	49	2,0
Classes requiring direct contact with the teacher	36	1,4
Student's own work (literature studies, preparation for exercises, preparation for colloquium, preparation for passing) [1]	13	0,6

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[1] delete or add other activities as appropriate