COURSE DESCRIPTION CARD - SYLLABUS

Course name
On-board systems in aviation

Course

Field of study
Aerospace Engineering

Year/Semester
1 / 2

Area of study (specialization)
Engineering and technical sciences

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars
30

Number of credit points

2

Lecturers

Responsible for the course/lecturer:
EngD Wojciech Prokopowicz

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Faculty of Environmental Engineering and
Energy

ul. Piotrowo 3; 60-965 Poznań

Responsible for the course/lecturer:

Prerequisites

Basic knowledge in the field of mechanics, airframe construction, metrology, strength of materials, non-destructive testing, automatic system engineering.

Course objective

Knowledge of the purpose, construction and principles of operation of the basic technical parameters of devices and systems. Ability to read and interpret indications of on-board equipment.

Course-related learning outcomes

Knowledge

Student has extensive knowledge, necessary for understanding of profile subjects and specialist

knowledge about construction, methods of construction, manufacturing, exploitation, air traffic management, security systems, impact on the economy, society and environment of the aviation and cosmonautics for selected specialties: Aeronautical Engineering

Student has detailed knowledge related to selected issues in the field of construction of manned and unmanned aircraft, in the field of on-board equipment, control systems, communication and registration systems, life support systems, automation of particular systems

Student has ordered, supplemented with theoretical issues knowledge in the field of on-board equipment: as well as on-board and ground-based electronic communication systems, remote sensing systems, observation systems, satellite navigation systems

Skills

Student is able to communicate using various techniques in a professional environment and other environments using a formal record of construction, technical drawing, concepts and definition of the scope of the studied field of study

Student has the ability to self-study using modern teaching tools, such as remote lectures, websites and databases, didactic programs, e-books

Student can obtain information from literature, the Internet, databases and other sources. Can integrate the information obtained and interpret conclusions and create and justify opinions

Student can draw a technical scheme of a complex machine element in accordance with the principles of technical drawing, can create a circuit diagram, select elements and perform basic calculations of the electrical and electronic system of sets of aircraft or space equipment

Social competences

Student understands the need to learn throughout life; he can inspire and organize the learning process of other people

Student 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 case of difficulties in solving the problem

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Written test. Presenting description and principles of operation of the selected aircraft equipment / system. Written work on the description and principles of operation of the selected aircraft equipment / system.

Programme content

Pilot and navigation equipment. Power, electric, hydraulic and pneumatic equipment. Diagnostic, communication and location equipment. Specialized equipment: human safety, safety of the flying vessel.

Teaching methods

Lecture—Showing/Telling, Project-Based Learning

Bibliography

Basic

Bilski J., Polak Z., Rypulak A., „Awionika, przyrządy i systemy pokładowe", WSOSP, Dęblin 2001

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Narkiewicz J., „Podstawy układów nawigacyjnych", WKŁ, 1999

Narkiewicz J., „GPS – Globalny System Pozycyjny", WKŁ, 2003

Stola M., „Wyposażenie samolotów", Wydawnictwo Politechniki Warszawskiej, Warszawa, 1978

Szczepański C., „Symulatory lotu", Wydawnictwo Politechniki Warszawskiej, Warszawa, 1990

Farrell, Jay A., „The Global Positioning System and Inertial Navigation",1997

Grewal, Mohinder S., „Global positioning systems, inertial navigation, and integration", 2001

Kayton M., Fried W.R., „Avionic Navigation Systems", Second Edition, John Wiley, 1996,

Moir I., Seabridge A., „Aircraft Systems"; Longman Scientific & Technical, London, 1992

Middleton D.H.,:"Avionic Systems", Longman Scientific & Technical, 1989

Moir I., Seabridge A., „Aircraft Systems"; Longman Scientific & Technical, London, 1992

Moir I., „Civil Avionics Systems", 2003

Neese W., "Aircraft Hydraulic Systems", Krieger Publishing Company, 1991

Pallet E.H.J., "Aircraft Instrument Systems", IAP, 1993

Pallet E.H.J., "Aircraft Instruments and Integrated Systems", Longman Scientific and Technical Series, 1992

Spitzer, Cary R. Red., „The avionics handbook", 2001

Titterton, David H., „Strapdown Inertial Navigation Technology", 1997

Additional

Technical Order: F-16, C-130 Herkules, B737, ERJ-145, G550, C-295

FAA (2002). FAA Joint Aircraft System/Component code tables and definitions. Issue Feb 2002

Jenkins, G.M. (1977). The systems approach. In: Systems Behaviour (eds. J. Beishon and G. Peters)

Breakdown of average student's workload

	Hours	ECTS
Total workload	62	2,0
Classes requiring direct contact with the teacher	45	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	62	2,0

[1] delete or add other activities as appropriate