

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Onboard equipment		Code 1010601161010637566
Field of study Aerospace Engineering	Profile of study (general academic, practical) general academic	Year /Semester 3 / 6
Elective path/specialty Aircraft Engines and Airframes	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: First-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: 1 Laboratory: - Project/seminars: -		No. of credits 4
Status of the course in the study program (Basic, major, other) other		(university-wide, from another field) university-wide
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 4 100% 4 100%
Responsible for subject / lecturer: Dr eng. Wojciech Prokopowicz email: wojtek379@wp.pl tel. +48 606 638 410 Faculty of Transport Engineering ul. Piotrowo 3; 60-965 Poznań		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge in the field of mechanics, airframe construction, metrology, strength of materials, non-destructive testing
2	Skills	He can apply the scientific method in solving problems, carrying out experiments and gain conclusions
3	Social competencies	He knows the limits of his knowledge and skills; can precisely formulate questions, understands the need for further education
Assumptions and objectives of the course: -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.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. has ordered, theoretically founded general knowledge covering key issues in the field of on-board equipment, as well as on-board and terrestrial electronic communication systems - [[K1_W09]]		
2. has detailed knowledge related to selected issues in the field of construction of manned and unmanned aircraft, including on-board equipment and their main components - [[K1_W13]]		
Skills:		
1. Is able to use verbal communication in one additional foreign language at the level of everyday language - [[K1A_U07]]		
2. Is able to prepare technical documentation descriptively - drawing an engineering task - [[K1A_U06]]		
3. Can use the acquired mathematical theories to create and analyze simple mathematical models of machines and their components and simple technical systems. - [[K1A_U09]]		
4. Able to draw a diagram, a simple machine element and a component of the airframe according to the principles of technical drawing - [[K1A_U16]]		
Social competencies:		
1. understands the need to learn throughout life; can inspire and organize the learning process of other people - [[K1_K01]]		
2. 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 - [[K1_K02]]		

Assessment methods of study outcomes		
- Written test - Oral test		
Course description		
-Pilot and navigation equipment. Power, electric, hydraulic and pneumatic equipment. Diagnostic, communication and location equipment. Specialized equipment: human safety, safety of the flying vessel.		
Basic bibliography: <ol style="list-style-type: none"> 1. Bilski J., Polak Z., Rypulak A., ?Awionika, przyrządy i systemy pokładowe?, WSOSP, Dęblin 2001 2. Gosiewski Z., Ortyl A., ?Inercjalny, bezkardanowy system orientacji przestrzennej i nawigacji ? zasada działania?, Wyd. Instytut Lotnictwa, 1999 3. Grabiec R., ?Lotnicze systemy zobrazowania informacji?, skrypt WAT, 1996 4. Kazana J, Lipski J., ?Budowa i eksploatacja pokładowych przyrządów pokładowych?, Wydawnictwa Komunikacji i Łączności, Warszawa 1983 5. Narkiewicz J., ?Podstawy układów nawigacyjnych?, WKŁ, 1999 6. Narkiewicz J., ?GPS ? Globalny System Pozycyjny?, WKŁ, 2003 7. Stola M., ?Wyposażenie samolotów?, Wydawnictwo Politechniki Warszawskiej, Warszawa, 1978 8. Szczepański C., ?Symulatory lotu?, Wydawnictwo Politechniki Warszawskiej, Warszawa, 1990 9. Farrell, Jay A., ?The Global Positioning System and Inertial Navigation?, 1997 10. Grewal, Mohinder S., ?Global positioning systems, inertial navigation, and integration?, 2001 11. Kayton M., Fried W.R., ?Avionic Navigation Systems?, Second Edition, John Wiley, 1996 12. Moir I., Seabridge A., ?Aircraft Systems?, Longman Scientific & Technical, London, 1992 13. Middleton D.H., ?Avionic Systems?, Longman Scientific & Technical, 1989 14. Moir I., Seabridge A., ?Aircraft Systems?, Longman Scientific & Technical, London, 1992 15. Moir I., ?Civil Avionics Systems?, 2003 16. Neese W., ?Aircraft Hydraulic Systems?, Krieger Publishing Company, 1991 17. Pallet E.H.J., ?Aircraft Instrument Systems?, IAP, 1993 18. Pallet E.H.J., ?Aircraft Instruments and Integrated Systems?, Longman Scientific and Technical Series, 1992 19. Spitzer, Cary R. Red., ?The avionics handbook?, 2001 20. Titterton, David H., ?Strapdown Inertial Navigation Technology?, 1997 		
Additional bibliography: <ol style="list-style-type: none"> 1. Technical Order, F-16, C-130 Herkules, B737, ERJ-145, G550 		
Result of average student's workload		
Activity	Time (working hours)	
1. Preparation for the exam	45	
2. Participation in the exam	10	
3. Participation in lectures	4	
Student's workload		
Source of workload	hours	ECTS
Total workload	60	4
Contact hours	50	3
Practical activities	10	1