

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Fuels and oils		Code 1010621271010614411
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 4 / 7
Elective path/specialty Aircraft Transport	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: 1 Classes: - Laboratory: 1 Project/seminars: -		No. of credits 2
Status of the course in the study program (Basic, major, other) (brak)		(university-wide, from another field) (brak)
Education areas and fields of science and art technical sciences		ECTS distribution (number and %) 2 100%
Responsible for subject / lecturer: Prof. Wiesław Zwierzycki, D.Sc, Eng. email: wieslaw.zwierzycki@put.poznan.pl tel. (061) 665-2236 Faculty of Machines and Transport 3 Piotrowo street, 60-965 Poznan, Poland		Responsible for subject / lecturer: Andrzej Waliszewski D.Sc, Eng email: Andrzej Waliszewski D.Sc, Eng tel. (061) 665-2232 Faculty of Machines and Transport 3 Piotrowo street, 60-965 Poznan, Poland
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge of materials science, physics, chemistry and mathematics
2	Skills	Able to apply the scientific method to solve problems, implement experiments and reasoning
3	Social competencies	Knows the limitations of their knowledge and skills; can precisely formulate questions, understands the need for further education
Assumptions and objectives of the course: To familiarize students with the working conditions for aviation supplies, properties of these materials, methods of diagnosis and technologies to prepare prior to the application of fuel for aircraft and methods of measurement of physical and chemical properties of these supplies		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has a basic knowledge of ordinal fuels and lubricants used in the aviation - [-]		
Skills:		
1. Is able to search in catalogs and on websites of manufacturers of fuel and lubricants - [-]		
Social competencies:		
1. He can think and act in a creative and enterprising way - [K1A_K05]		
2. Is aware of and understands the validity of the non-technical aspects and effects of engineering activities, including its impact on the environment and the associated responsibility for decisions - [K1A_K02]		
3. Has a sense of responsibility for their own work and willingness to comply with the rules of working in a team and to take responsibility for collaborative tasks - [K1A_K04]		
Assessment methods of study outcomes		
Exam and the current control to the individual exercises and evaluation reports		
Course description		

<p>lectures: The chemical composition and methods of preparation of aviation fuels and lubricants from crude oil. The operating conditions for all kinds of aircrafts. Physic-chemical and functional properties of aviation fuels (aviation gasoline for piston engines, aviation kerosene and other fuels for turbine engines). Technology of preparation prior to the application of fuel tanks for aircraft. Properties of lubricating oils and greases. Properties of technical liquids. Diagnosis of fuel and other consumables. Products of petroleum and natural environment.</p> <p>laboratory: Determination of fractional composition of aviation gasoline by distillation Study on conductivity of aviation fuels The use of infrared spectroscopy to identify and assess changes in operating air motor oils The study of aviation fuel lubricity Determination of the characteristics of density-temperature of jet fuel Measurement of flash point and low temperature properties of fuels Measurement of air penetration greases</p>		
<p>Basic bibliography: 1. Górski K., Górski W., Napędy lotnicze. Materiały pędne i smary, Wydawnictwo Komunikacji i Łączności, Warszawa ? 1986 2. Zwierzycki W., Płyny eksploatacyjne do środków transportu drogowego, Wydawnictwo Politechniki Poznańskiej, Poznań ? 2006 3. Czarny R., Smary plastyczne, Wyd. NT, Warszawa 2004</p>		
<p>Additional bibliography:</p>		
<p>Result of average student's workload</p>		
<p>Activity</p>		<p>Time (working hours)</p>
<p>1. Preparation for test</p>		<p>5</p>
<p>2. Preparation for laboratory classes and preparation of laboratory reports</p>		<p>24</p>
<p>Student's workload</p>		
<p>Source of workload</p>	<p>hours</p>	<p>ECTS</p>
<p>Total workload</p>	<p>62</p>	<p>2</p>
<p>Contact hours</p>	<p>33</p>	<p>1</p>
<p>Practical activities</p>	<p>40</p>	<p>2</p>