

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Aircraft Propulsion Systems		Code 1010621211010623533
Field of study Transport	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Aircraft Transport	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) full-time	
No. of hours Lecture: 2 Classes: - Laboratory: 1 Project/seminars: -		No. of credits 3
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 %) 3 100%
Responsible for subject / lecturer: Jarosław Markowski, D.Sc.Eng email: jaroslaw.markowski@put.poznan.pl tel. (061) 647-5992 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 physics, mechanics, fluid mechanics
2	Skills	Ability to think analytically, conduct analysis of cause and effect
3	Social competencies	Is able to work in a group, submit your own thoughts and assessment supported by reasoned
Assumptions and objectives of the course: Getting to know the types and construction of aircraft propulsion systems, and the consequences of their use. Overview of modern aircraft propulsion systems design.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has ordered knowledge of the means of air transport, general characteristics and classification of their power sources transmissions, the basic technical parameters, the overall structural system - [-]		
2. Has detailed knowledge necessary for understanding the specialized subjects and expertise covered by the profile specjalizacyjnym: air transport - [-]		
Skills:		
1. Is able to obtain information from the literature, the Internet, databases and other sources, in Polish and foreign language, can integrate the information obtained to interpret and draw conclusions from them, and create and justify opinions - [K2A_U01]		
2. Is able to self-education and is able to determine the directions of further learning using modern teaching tools such as remote lectures, web pages and databases, educational programs, books and electronic journals - [K2A_U06]		
3. Is able to analyze objects and technical solutions can search in catalogs and on websites of manufacturers ready components of machinery and equipment, including means and transport equipment and storage, to evaluate their suitability for use in their own projects, technical and organizational - [K2A_U10]		
4. Is able to draw freehand machine parts and schematics in accordance with the principles of engineering drawing by European standards - [K2A_U12]		
5. Is able to be used practically office computer packages for solving and editing of technical texts in the formulas and tables, technical and economic calculations using a spreadsheet and conduct a simple relational database - [K2A_U17]		
Social competencies:		

1. understands the need and knows the possibilities of continuous training, knows the need to acquire new knowledge in order to develop professional, able to organize the learning process of others - [K2A_K01]
2. Is aware of the importance and understand the business impact of non-technical engineer in the field of multi-faceted impact of air transport - [K2A_K02]
3. Is able to identify and resolve the dilemmas associated with the profession, among others. problems at the level of technique - the environment - [K2A_K06]
4. Is aware of the transfer of knowledge to the public, shall endeavor to ensure that information can be understood - [K2A_K08]

Assessment methods of study outcomes		
Written exam or test		
Course description		
<p>History of aircraft propulsion systems development (piston engines and jet). Theoretical principles of piston and jet aircraft propulsion systems operation. Classification of jet propulsion systems (turbine, fan, jet, turboshaft, etc.), comparing the types of drives. The concept of a jet engine thrust, engine performance indicators. Construction of aviation piston engine and jet. Compressors, turbines, combustion chambers, nozzles, afterburners. The characteristics of piston engines and jet. Selection of an aircraft engine. Equipment power units (power supply systems, lubrication and cooling). Control and monitoring of power units. Operation drives. Overview of the structure of modern aircraft propulsion systems and prospects of their development.</p>		
Basic bibliography:		
<ol style="list-style-type: none"> 1. W. Cheda, M. Malski ? Techniczny poradnik lotniczy. Silniki. WKiŁ, Warszawa 1984 2. The Jet Engines. Wyd. Rolls Royce 1986 r. 3. Dzierzanowski P., Kordziński W., Otyś J., Łyżwiński M., Szczeciński S., WiatrekR.: Napędy Lotnicze. Turbinowe silniki odrzutowe. WKŁ, Warszawa 1983. 4. Dzierzanowski P., Kordziński W., Otyś J., Szczeciński S., WiatrekR.: Napędy Lotnicze. Turbinowe silniki śmigłowe i śmigłowcowe. WKŁ, Warszawa 1985. 		
Additional bibliography:		
<ol style="list-style-type: none"> 1. Kotlarz W.: Turbinowe zespoły napędowe źródłem skażeń powietrza na lotniskach wojskowych. (Turbine Driving Systems as Pollution Sources at Military Airports), Air Forces Academy, Dęblin 2004. 		
Result of average student's workload		
Activity	Time (working hours)	
1. Preparation for lectures	4	
2. Participation in lectures	30	
3. Office hours	5	
4. Preparation for exam	10	
5. Participation in exam	1	
6. Preparation for laboratories	5	
7. Participation in laboratories	15	
8. Preparation for laboratory test	5	
9. Participation in laboratory test	1	
Student's workload		
Source of workload	hours	ECTS
Total workload	76	3
Contact hours	45	2
Practical activities	15	1