

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Technical Thermodynamics		Code 1010632211010630911
Field of study Mechanical Engineering	Profile of study (general academic, practical) (brak)	Year /Semester 1 / 1
Elective path/specialty Thermal Engineering	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: 1 Classes: 1 Laboratory: - 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 Technical sciences		ECTS distribution (number and %) 2 100% 2 100%
Responsible for subject / lecturer: Prof. dr hab inż. Ewa Tuliscka Sznitko email: ewa.tuliszka-sznitko@put.poznan.pl tel. 2212 Wydział Maszyn Roboczych i Transportu http://www.fwmt.put.poznan.pl/		
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Basic knowledge about fundamentals of thermodynamics and processes of energy conversion in thermal equipments
2	Skills	Ability to describe and calculate the basic thermodynamics processes and primary energy conversion systems
3	Social competencies	Is able to improve professional competencies and be ready to collaborate in team
Assumptions and objectives of the course: Introduction to basic thermodynamics processes, description of energy conversion processes		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Has a basic knowledge of technical thermodynamics and energy conversion		- [K1A_W08]
Skills:		
1. Is able to perform technical calculations in thermodynamics		- [K1A_U17]
Social competencies:		
1. Understand the need and knows the possibility of lifelong learning		- [K1A_K01, K1A_K04]
Assessment methods of study outcomes		
Exam		
Course description		
Introduction. Basic relations. Ideal and real gases. Thermodynamics cycles. I and II law of thermodynamics. Efficiency of thermodynamics cycles. Thermodynamics of water dump and humanity air. Introduction to heat transfer. Clausius-Rankin cycles. Internal combustion engines cycles.		

Basic bibliography:		
1. Kalinowski E.: Termodynamika, Wyd. P. Wr. 1994		
2. Szargut J.: Termodynamika techniczna, Wyd. P. Śl. 1997		
3. Wiśniewski St.: Termodynamika techniczna, WNT 1995		
4. Tuliszka E. Red.: Termodynamika techniczna. Zbiór zadań, Nr 889, Wyd. P.P. 1980		
5. Gumiński K. Termodynamika, PWN Warszawa 1972		
6. Michałowski St., Wańkowicz K., Termodynamika procesowa, WNY, Warszawa 1999		
7. Kestin J.: Course in Thermodynamics, New York, Hemisphere 1979		
Additional bibliography:		
1. Tuliszka E.: Teoria maszyn ciepłych, Nr 511, Wyd. P.P. 1974		
2. Wiśniewski St., Staniszewski B., Szymanik R., Termodynamika procesów nierównowagowych, PWN, Warszawa 1973		
3. M.J. Morano, H.N. Shapiro: Fundamentals of Engineering Thermodynamics, John Wiley & Sons, New York, 1998		
Result of average student's workload		
Activity	Time (working hours)	
1. Udział w wykładzie	15	
2. Utrwalanie treści wykładu	10	
3. Konsultacje	2	
4. Przygotowanie do ćwiczeń	15	
5. Przygotowanie do egzaminu	10	
6. Udział w egzaminie	2	
Student's workload		
Source of workload	hours	ECTS
Total workload	54	2
Contact hours	20	1
Practical activities	1	1