



MODULE SPECIFICATION

Module code	
Module title in Polish	Wentylatory i sprężarki
Module title in English	Fans and Compressors
Module running from the academic year	2016/2017

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Environmental Engineering
Level of qualification	first cycle (first cycle, second cycle)
Programme type	academic (academic/practical)
Mode of study	full-time (full-time/part-time)
Specialism	Sanitary Pipelines and Systems
Organisational unit responsible for module delivery	Department of Piped Utility Systems
Module co-ordinator	Tadeusz Orzechowski, PhD hab., Eng., Professor of the University
Approved by:	Prof. Andrzej Kulickowski, PhD hab., Eng.

B. MODULE OVERVIEW

Module type	programme-specific module (core/programme-specific/elective HES*)
Module status	compulsory module (compulsory/optional)
Language of module delivery	Polish/ English
Semester in the programme of study in which the module is taught	semester 7
Semester in the academic year in which the module is taught	winter semester (winter semester/summer semester)
Pre-requisites	None (module code/module title, where appropriate)
Examination required	No (Yes/No)
ECTS credits	1

* elective HES – elective modules in the Humanities and Economic and Social Sciences

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	15				



C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aims of the module include: learning the principle of operation, types, and characteristics of particular types of fans and compressors applied in ventilation and air conditioning systems (as well as their structure).
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Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student knows basic concepts, the characteristics, demand for power, operational range of fans and compressors (as well as the principles of regulation methods and co-operation with the network).	l	IŚ_W10	T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_02	A student is familiar with the structure and characteristics of axial and radial fans, piston, helical, rotary, and spiral compressors (as well as compressing aggregates).	l	IŚ_W10	T1A_W04 T1A_W05 T1A_W06 T1A_W07
W_03	A student knows the principles of selecting fans.	l	IŚ_W10	T1A_W04 T1A_W05 T1A_W06 T1A_W07
U_01	A student can select fans and compressors for installation.	l	IŚ_U03 IŚ_U19	T1A_U02 T1A_U03 T1A_U05 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U11 T1A_U13 T1A_U14 T1A_U15 T1A_U16
K_01	A student can formulate conclusions and describe the results of the obtained work.	l	IŚ_K07	T1A_K07

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1.	Fans: basic notions, characteristics, demand for power, and operational range.	W_01 U_01
2.	Axial and radial fans, the selection of fans.	W_02 W_03 U_01
3.	Drive, regulation methods and the co-operation with the network.	W_01 U_01
4.	Axial and helical compressors.	W_02 U_01
5.	Rotary compressors with rotational pistons, spiral compressors.	W_02 U_01
6.	Multi-degree compression (compressor units).	W_02 U_01

Assessment methods



Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01	A test
W_02	A test
W_03	A test
U_01	A test
K_01	A test

D. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	15
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	
4	Contact hours: attendance at office hours (2-3 appointments per semester)	5
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	
8		
9	Number of contact hours	20 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.8
11	Private study hours: background reading for lectures	3
12	Private study hours: preparation for classes	2
13	Private study hours: preparation for tests	
14	Private study hours: preparation for laboratories	
15	Private study hours: writing reports	
16	Private study hours: preparation for a final test in laboratories	
17	Private study hours: preparation of a project/a design specification	
18	Private study hours: preparation for an examination	
19		
20	Number of private study hours	5 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	0.2
22	Total study time	25
23	Total ECTS credits for the module <i>(1 ECTS credit = 25-30 hours of study time)</i>	1
24	Number of practice-based hours <i>Total practice-based hours</i>	
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit = 25-30 hours of study time)</i>	



E. READING LIST

References	<ol style="list-style-type: none">1. Cengel Y.A., Heat Transfer – a practical approach, McGraw-Hill Higher Education, 20032. Cengel Y.A., Turner R.H., Fundamentals of Thermal – Fluid Sciences, McGraw-Hill Higher Education, 20013. Winterbone D.E., Advanced Thermodynamics for Engineers, John Wiley&Sons, Inc, 19974. Wong Kau-Fui Vincent, Thermodynamics for engineers, Boca Raton: CRC Press, cop. 20005. Logan Earl, jr., Thermodynamics: processes and applications, New York: Marcel Dekker, Inc., 19996. Moran Michael J., Fundamentals of engineering thermodynamics, John Wiley & Sons, cop. 2008 (2007), 6th ed.
Module website	<p>http://turbolab.tamu.edu/proc/turboproc/T21/T21183-188.pdf https://books.google.pl/books?isbn=8121931827 http://www.cagi.org/pdfs/cagi-air-compressor-hp.pdf</p>