

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	Academic profile
Course name	Mechanical equipment in Environmental Engineering							Course code	IS-FCEE-00201S
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	15		15	15				No. of ECTS credits	4
Entry requirements	Mathematics, Physics								
Course objectives	Obtain knowledge of various types of pumps, ventilators, compressors and hydraulic design.								
Course content	Pumps: pump hydraulics, system head curve, operating point for pump, pump selection, pump curves, mechanical and electrical power, parallel and series pumps selection, cavitation in pumps, pump operation. Ventilators and compressor: construction, system curve, ventilator selection.								
Teaching methods	lecture, project, laboratory classes								
Assessment method	lecture - written exam or oral exam, laboratory classes - assessment of reports, preparation tests for exercises, project - project completion, presentation and discussion;								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	has an elementary knowledge of pumps, ventilators and compressors.							K_W013,	
LO2	understand the basic physical phenomena in the mechanical appliances in Environmental Engineering							K_W014,	
LO3	able to selection of pump using computer program							K_W015,	
LO4	know the basic knowledge, standards pump selection							K_W016,	
LO5	able to prepare and present a presentation of the results of measurement							K_U02, K_U04,	
LO6	able to calculate and measure pump, ventilators and compressor parameter and curves							K_U11,	

L07	use the hygiene and safety at work	K_U12,	
L08	able to work independently and in a team	K_K04	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	written exam and test from lecture and laboratory classes	L, LC	
L02	written exam and test from lecture and laboratory classes	L, LC	
L03	report from project	P	
L04	report from project	P	
L05	report from laboratory classes	LC	
L06	report from laboratory classes	LC	
L07	observation of students working during the laboratory classes	LC	
L08	observation of students working during the laboratory classes	LC	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15h	
	participation in classes, laboratory classes, etc.	30h	
	preparation for raport laboratory classes, project	15h	
	working on projects, reports, etc.	15h	
	participation in student-teacher sessions related to the project/ laboratory classes	20h	
	implementation of project tasks	5h	
	preparation for and participation in exams/tests	10h	
TOTAL:		110h	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		65	2
Student workload – practical activities		45	2
Basic references	<ol style="list-style-type: none"> 1. Karassik I., Messina J., Cooper P., Heald Ch., Pump Handbook 4th Edition, 2008 2. Sulzer Pumps, Centrifugal Pump Handbook 3rd Edition, Butterworth-Heinemann, 2010 3. Pelikan B.: The Pump Book, 2010 		
Supplementary references	<ol style="list-style-type: none"> 1. Robert X. Perez., Operator's Guide to Centrifugal Pumps, 2008 2. Tyler G. Hicks, Handbook of Mechanical Engineering Calculations, Second Edition, McGraw-Hill Education, 2006 3. Chadwick A., Morfett J., Borthwick M., Hydraulics in Civil and Environmental Engineering 5th Edition, CRC Press,2013 		
Organisational unit conducting the course	HVAC Department	Date of issuing the programme	
Author of the	dr inż.Tomasz Teleszewski	18.02.2020	

programme		
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L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar