

## COURSE DESCRIPTION CARD – HEAT EXCHANGERS

Faculty of Mechanical Engineering									
Field of study	Power engineering							Degree level and programme type	Batchelor's degree
Specialization/ diploma path								Study profile	
Course name	Heat exchangers							Course code	IS-FME-00196S
								Course type	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	summer
	30	15	-	-	-			No. of ECTS credits	3
Entry requirements	Heat transfer, Fluid mechanics								
Course objectives	Acquirement of skills and qualifications in: (a) thermal analysis of heat exchangers and evaluation of performance; (b) applications of heat exchangers								
Course content	Heat exchanger classifications. Flow arrangements of heat exchangers; counter-, parallel-, multipass- and cross- flow arrangements. Methods of heat exchanger analysis: log mean temperature difference, effectiveness vs. NTU method. Compact heat exchangers. Analysis of regenerators								
Teaching methods	Oral lectures supplemented by practical classes								
Assessment method	Written tests (2 for oral lectures, 1 for practical lectures))								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	skills in analysis of heat exchangers by log mean temperature difference method								
LO2	skills in analysis of heat exchangers by effectiveness vs. NTU method								
LO3	skills in analysis of compact heat exchangers								
LO4	skills in analysis of regenerators								
LO5	skills in selection of heat exchangers for specific applications								
LO6	skills in computational analysis of heat exchangers								
Symbol of learning outcome	Methods of assessing the learning outcomes							Type of tuition during which the outcome is assessed	

LO1	Test 1	oral	
LO2	Test 1	oral	
LO3	Test 1	oral	
LO4	Test 2	oral	
LO5	Test 2	oral	
LO6	Test	practical lectures	
<b>Student workload (in hours)</b>		<b>No. of hours</b>	
<b>Calculation</b>	Lecture attendance	30	
	Practical lectures attendance	15	
	Preparation for tests	8	
		<b>TOTAL:</b>	<b>53</b>
<b>Quantitative indicators</b>		<b>HOURS</b>	<b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		15	3
<b>Student workload – practical activities</b>		15	
<b>Basic references</b>	1. Incropera F. P., DeWitt D. P., Fundamentals of heat and mass transfer, Wiley&Sons, the 4th ed. 1996.. 2. Shah, R. K., Sekulić D., 2003, Fundamentals of Heat Exchanger Design, Wiley, Hoboken, New Jersey, 2003. 3. Kakaç S., Boilers, evaporators and condensers, Wiley&Sons, 1991.		
<b>Supplementary references</b>	1. Çengel Y. A., Boles M.A.: Thermodynamics: An Engineering Approach, McGraw-Hill, New York, 1989.		
<b>Organisational unit conducting the course</b>	Dept. of Machinery Design and Thermal Engineering	<b>Date of issuing the programme</b>	
<b>Author of the programme</b>	Prof. Teodor Skiepkó	22.03.2019	

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

Please notice!

Depending on number of students enrolled for the subject hours of tuition are as follows (for each 30 hours given in course description card):

1 – 2 students - 5 hours of tuition hours;

3 – 4 students - 8 hours of tuition;

5 – 6 students - 11 hours of tuition;

7 – 8 students - 15 hours of tuition;

9 and more students - hours of tuition given by a teacher as regular classes.

