

## COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Mechanical Engineering									
Field of study	Mechanics and Construction of Machinery							Degree level and programme type	Bachelor's degree
Specialization/ diploma path	Construction and Maintenance of Machinery and Vehicles							Study profile	
Course name	Combustion Engines and Fuels							Course code	IS-FME-00157W
								Course type	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	30		15					No. of ECTS credits	4
Entry requirements	-								
Course objectives	Familiarizing the participants with the construction and principle of operation of internal combustion engines. Presentation of the types of fuels used in engines and their characteristics								
Course content	<p>Lecture: General construction, principle and scheme of the system of internal combustion engines. Characteristics of fuel used to power the motors. Cycles comparative and actual charts indicated. Processes: charge exchange, creating a mixture of fuel and air compression and combustion. The forces acting systems of the engine. Determining performance characteristics of internal combustion engines. Diagnosis Current state of operation.</p> <p>Laboratory: Construction and operation of engine systems, charts indicated and performance characteristics</p>								
Teaching methods	lecture, laboratory classes								
Assessment method	Lecture - written exam, Laboratory class - evaluation of reports, class preparedness tests,								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	classifies and describes the structure and operation of various engine systems							M1_W06, M1_W12, M1_U01, M1_W19, M1_W20	
LO2	defines and characterizes types of fuels used to power engines							M1_W03	

LO3	identifies able to analyze methods of determining the characteristics of the engines	M1_W15, M1_U11, M1_U12
LO4	assesses the current operation of the engine using different methods	M1_W19, M1_W20, M1_W21
LO5	applies safety rules	M1_W22, M1_U23
LO6	can operate in one a team, successfully developed the measurement results	M1_U02, M1_K03
<b>Symbol of learning outcome</b>	<b>Methods of assessing the learning outcomes</b>	<b>Type of tuition during which the outcome is assessed</b>
LO1	exam, pass the theoretical part of the exercise laboratory report laboratory exercises	L, LC
LO2	exam	L
LO3	exam, pass the theoretical part of the exercise laboratory report laboratory exercises	L, LC
LO4	exam, pass the theoretical part of the exercise laboratory report laboratory exercises	L, LC
LO5	report on the exercise, observation of the work in the classroom laboratory	LC
LO6	discussion on the report of the exercise, observation of the work in the classroom laboratory	LC
<b>Student workload (in hours)</b>		<b>No. of hours</b>
<b>Calculation</b>	lecture attendance	15×2h=30
	participation in classes, laboratory classes, etc.	15×1h=15
	preparation for laboratory classes	15
	preparation for the exam and the presence on it	28h+2h=30
	preparing to pass laboratory classes (including the drafting of the report)	25
	participation in student-teacher sessions related to the lecture/laboratory	5
	<b>TOTAL:</b>	<b>120</b>
<b>Quantitative indicators</b>		<b>HOURS</b> <b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		<b>50</b> <b>2</b>
<b>Student workload – practical activities</b>		<b>60</b> <b>2</b>
<b>Basic references</b>	1. Hoon K. Advances in Internal Combustion Engines and Fuel Technologies, InTech, CC BY, 2013. 2. Gupta H.N. Fundamentals Of Internal Combustion Engines, Phi Learning Pvt. Ltd., 2012. 3. Heywood J. Internal Combustion Engine Fundamentals, McGraw-Hill Education. 1988.	
<b>Supplementary references</b>	1. Luft S., Podstawy budowy silników, WKiŁ, Warszawa, 2006. 2. Kneba Z., Makowski S., Zasilanie i sterowanie silników, WKiŁ, Warszawa, 2004.	
<b>Organisational unit conducting the course</b>	<b>Katedra Budowy i Eksploatacji Maszyn</b>	<b>Date of issuing the programme</b>
<b>Author of the programme</b>	<b>Andrzej Borawski, PhD</b>	<b>17.03.2021</b>

**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.