

Description of course			
Code of course	1160-TRTSEM-MSA-0111		
Name of course	Environmental Protection in Transport		
Version of course	2021/22		
A. Place of the course in system of studies			
Level of education	Second-cycle degree		
Form and mode of studies	Full-time studies		
Field of studies	Transport		
Profile of studies	General academic profile		
Specialization	Transport systems engineering and management		
Place of teaching of course	Warsaw University of Technology, Faculty of Transport, Division of Information and Mechatronic Systems in Transport		
Place of realization of course	Not applicable		
Coordinator of course	Sylvia Bęczkowska, Ph.D., Division of Information and Mechatronic Systems in Transport, Faculty of Transport, Warsaw University of Technology		
B. General characteristic of the course			
Group/Block of courses	Specialization subject		
Level of course	Intermediate level		
Type of course	Compulsory subject		
Language of course	English		
Location of the course in the study plan – nominal semester	1		
Location of the course in the academic year	Winter semester		
Preliminary requirements - formal	None.		
Limit of students	Lecture: 100, project: 18		
C. Effects of education and manner of teaching			
Purpose of course	Learn about global environmental issues and potential threats from environmental degradation, and acquire skills to prevent them.		
Effects of education with reference to the learning outcomes for the area and field of study			
No. effect	Description of the effect	Reference to the characteristics of learning outcomes	Reference to the learning outcomes in the program
Assumed learning outcomes in terms of knowledge			
W01	Knows and understands the problems of environmental pollution caused by the effects of land, sea and air transport.	I.P7S_WG.o I.P7S_WK	Tr2A_W09 Tr2A_W12
W02	Knows and understands the sustainable development of the environment, its threats, ecological balance and global effects.	I.P7S_WG.o I.P7S_WK	Tr2A_W09 Tr2A_W12
W03	Knows and understands modern solutions in vehicle construction, limiting their impact on the environment and methods of countering pollution.	I.P7S_WG.o I.P7S_WK	Tr2A_W05 Tr2A_W09 Tr2A_W11
Assumed learning outcomes in terms of skills			
U01	Is able to assess the impact of harmful factors on the environment.	I.P7S_UW.o III.P7S_UW.o I.P7S_UK	Tr2A_U07 Tr2A_U08 Tr2A_U13 Tr2A_U19
U02	Is able to develop a concept of limiting the environmental impact of various transport infrastructures on the basis of literature.	I.P7S_UW.o III.P7S_UW.o I.P7S_UK	Tr2A_U01 Tr2A_U17 Tr2A_U19
Assumed learning outcomes in the field of social competences			
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<i>Form of didactic studies and number of hours</i>	<i>Lecture</i>	<i>Exercise</i>	<i>Laboratory</i>	<i>Project</i>	<i>Other</i>
<i>On a weekly plan</i>	2	0	0	2	0
<i>Throughout the semester</i>	15	0	0	15	0
<i>Contents of education - separately for each form of didactic studies</i>	<p>Lecture: Sustainable development of the environment, its threats, ecological balance. The greenhouse effect. Assessment of environmental pollution due to the impact of land, sea and air transport. Sources and risks of mechanical vibration and noise in the environment and risk assessment. Selected legal issues in environmental protection, environmental monitoring and directions of ecological policy in Poland and the EU. Ecological vehicles - modern vehicle design solutions that reduce their impact on the Environment (biofuels, hybrid engines, fuel cells).</p> <p>Project: The concept of introducing changes to reduce the impact of negative factors on the environment in the selected area.</p>				
<i>Teaching methods</i>	<p>Lecture: Lecture delivered in a multimedia format using innovative learning techniques and skill enhancement resulting from participation in a course from the NERW program.</p> <p>Project: Discussion of assumptions for the project. Students independently prepare a project at home using multimedia tools.</p>				
Methods of verification of effects of education					
<i>No. effect</i>	<i>Methods of verification</i>				
Assumed learning outcomes in terms of knowledge					
W01	Written test with possibility open questions. Correct answers is required for at least 60% of these questions.				
W02	Written test with possibility open questions. Correct answers is required for at least 60% of these questions.				
W03	Written test with possibility open questions. Correct answers is required for at least 60% of these questions.				
Assumed learning outcomes in terms of skills					
U01	Correctly prepare and present a project based on relevant literature, using multimedia tools.				
U02	Correctly prepare and present a project based on relevant literature, using multimedia tools.				
Assumed learning outcomes in the field of social competences					
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<i>Methods of evaluation</i>	<p>Lecture: Written test with possibility open questions. Correct answers is required for at least 60% of these questions.</p> <p>Project: Correctly prepare and present a project based on relevant literature, using multimedia tools.</p> <p>Integrated degree: The course mark is an integrated mark consisting of a test and a project mark.</p>				
<i>Exam</i>	<i>No</i>				
<i>Literature</i>	<p>Basic literature:</p> <ol style="list-style-type: none"> Holder J., Lee M.: Environmental Protection, Law and Policy Text and Materials, University College London, 2012. Blum E., Evans V., Dooley J.: Environmental Science. Career Paths, Express Publishing, 2020. Atapattu S., Schapper A.: Human Rights and the Environment, Key Issues 2019. Sarukkalige Priyantha Ranjan, Effects of Global Warming on Coastal Groundwater Resources, VDM Verlag Dr. Müller 2019. https://www.epa.gov/laws-regulations https://europa.eu/european-union/topics/environment_en https://www.eea.europa.eu/ <p>Supplementary literature:</p> <ol style="list-style-type: none"> Useful Websites - Environment and Ecology <ul style="list-style-type: none"> Center for Climate and Energy Solutions (C2ES) NOAA Climate. 				

	<ul style="list-style-type: none"> • Global Forest Watch (GFW) • Endangered Species. • National Centers for Environmental Information (NCEI) • NOAA National Ocean Service. • NOAA National Weather Service. • United Nations Environment Network
<i>Website of the course</i>	–
D. Student's activity	
<i>Number of ECTS credits</i>	2
<i>Number of hours of student's work to achieve effects of education</i>	<i>60 hours, including: work on lectures 15 hours, work on design exercises 15 hours, getting acquainted with the literature on the subject 8 hours, consultations 2 hours (including consultations for project design 1 hours), preparation to pass the lecture 7 hours, preparation of project work outside class hours 12 hours, defense of a project work 1 hours.</i>
<i>Number of ECTS credits on the course with direct participation of academic teacher</i>	<i>1,5 ECTS (33 hours, including: work on lectures 15 hours, work on design exercises 15 hours, consultations 2 hours, defense of a project work 1 hours)</i>
<i>Number of ECTS credits on practical activities on the course</i>	<i>1,0 ECTS (29 hours, including: work on design exercises 15 hours, consultations for project design 1 hours, preparation of project work outside class hours 12 hours, defense of a project work 1 hours)</i>
E. Additional information	
<i>Notes</i>	<i>As long as it does not cause changes in the relationship of a given subject with the directional effects in the content of education, changes may be introduced on an ongoing basis, taking into account the latest scientific achievements.</i>
<i>Date of last edition</i>	2021-02-09 10:00