STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Environmental Protection in Road Engineering**		Code **1010102111010121021**
Field of study **Civil Engineering Second-cycle Studies**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 1**
Elective path/specialty **Roads and Airfields**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **Second-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **1** Classes: **-** Laboratory: **-** Project/seminars: **1**		No. of credits **2**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(brak)**	
Education areas and fields of science and art **technical sciences**		ECTS distribution (number and %) **2 100%**

Responsible for subject / lecturer:

dr inż. Agnieszka Płatkiewicz
email: agnieszka.platkiewicz@put.poznan.pl
tel. 061 6652-486
Faculty of Civil and Environmental Engineering
ul. Piotrowo 5 60-965 Poznań

Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of mathematics, physics, chemistry Basic knowledge of land use planning and of the impact of the investment execution on the environment Basic knowledge of design, construction, maintenance and exploitation of roads Knowledge of road materials, the types and the technology of road pavement construction Knowledge of the principles of geometry, the technical drawing and the preparation of drawings using the CAD software
2	**Skills**	The ability to prepare project documentation of the road at a preliminary design level (programming concept) The ability to read drawings and to prepare a graphical documentation by using the CAD software
3	**Social competencies**	The ability to work independently and in a team Application of the principles of ethics in your behaviour

Assumptions and objectives of the course:

The knowledge of the impact of the road investments on the environment

The ability to identify and solve major issues concerning the environmental protection at the design, construction and exploitation of roads

The ability to independent study of new problems and to solve them while conducting research work

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. The student has knowledge of the impact of the road investments on the environment - [K_W13]
2. The student has knowledge of the methods of environment protection and of the basic legislation in this area - [K_W13, K_W17]
3. The student knows the environmental defense instruments while the road investments execution - [K_W13, K_W14]

Skills:

1. The student is able to design the green areas near roads - [K_U12]
2. The student can determine traffic noise level - [K_U12]
3. The student can determine the proper location of the noise barrier as one of the means of protection against traffic noise - [K_U12]

Social competencies:

1. The student deepens the ability to work independently - [K_K01]
2. The student follows the rules of ethics - [K_K11]
3. The student is aware of the sustainable development in building - [K_K04]
4. The student is aware of the non-technical aspects and effects of engineering activities. The student is responsible for his/hers decisions - [T2A_K02]

Assessment methods of study outcomes

Lectures- students? knowledge is assessed on the basis of a written exam which takes place during last lecture (according to the timetable). The exam consists of 4 questions and lasts 30 minutes.

Students are informed about exam?s date, form and time during the first lecture.

Grading scale:

15 points	- A (very good)
13-14 points	- B (good plus)
11-12 points	- C (good)
9 -10 points	- D (satisfactory plus)
7-8 points	- E (satisfactory)
below 7 points	- F (fail)

Projects - students? skills are assessed on the basis of a projects which must be handed in during last class. The projects must be done according to the topic assigned during the first classes. The projects are assessed in terms of content and aesthetics.

Course description

Lectures:

1. The environmental condition in Poland
2. The impact of the road investments on the environment
3. Passive and active environmental protection
4. Protection against road noise and vibrations
5. Protection against air pollution
6. Protection of water and soil
7. Nature and landscape protection
8. The process of evaluating the impact of the road investments on the environment

Projects:

Part I- structuring the green areas near roads through selection proper localization and description of the green areas functions

Part II- calculating the traffic noise level at the source and at the recipient, selecting and determining the proper localization

Basic bibliography:

1. Praca zbiorowa, Zasady ochrony środowiska w drogownictwie, Generalna Dyrekcja Dróg Publicznych, (opracowanie IBDiM), Warszawa, 1999
2. Praca zbiorowa, Podręcznik dobrych praktyk wykonywania opracowań środowiskowych dla dróg krajowych, EEKOM sp. z o.o., Kraków, 2008
3. Praca zbiorowa, Ekologia dróg, Island Press, 2003 (przekład 2009)
4. Praca zbiorowa, Zasady ochrony środowiska w budowie dróg, Generalna Dyrekcja Dróg Publicznych, Warszawa, 1993

Additional bibliography:

1. Izabella Olędzka-Graffstein, Zagadnienia ochrony środowiska w otoczeniu dróg, Wydawnictwa Komunikacji i Łączności, Warszawa, 1983
2. Zbigniew Engel, Ochrona środowiska przed drganiami i hałasem, PWN, Warszawa, 2001

Result of average student's workload

Activity	Time (working hours)

1. Participation in lecture	15
2. Participation in projects	15
3. Participation in consulation	3
4. Project realization	20
5. Preparation for the exam	10

Student's workload

Source of workload	hours	ECTS
Total workload	63	2
Contact hours	33	1
Practical activities	15	1