STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Diagnostic of Pavement**		Code **1010102121010121018**
Field of study **Civil Engineering Second-cycle Studies**	Profile of study (general academic, practical) **(brak)**	Year /Semester **1 / 2**
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 **3**
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 %) **3 100%**

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of road engineering. Knowledge of developmental trends and new achievements in the field of road engineering The essential knowledge for understanding the social, economic and legal considerations of engineering
2	**Skills**	The ability to identify and formulate the specifications of simple engineering taska specific for road engineering The ability to acquire information from literature, databases and other sources and to integrate obtained data. The ability to interpret and draw conclusions The ability to critically analyze and to evaluate of existing road construction technologies
3	**Social competencies**	The ability to work independently and in a team The awareness of the non-technical effects of engineering activities, including its impact on the environment and responsibility for the decisions

Assumptions and objectives of the course:

The knowledge of the analysis, design and use of engineering structures
The ability to identify and solve significant problems concerning the pavement diagnostics
Acquiring the ability self-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 external and the technological factors affecting the road pavement condition - [K_W07]
2. The student has knowledge of methods and systems of assessment of road pavement condition - [K_W10, K_W19]
3. The student knows the prediction methods of the road pavement condition - [K_W04, K_W19]
4. The student knows the current laws concerning roads pavement diagnostics - [K_W17, K_W19]

Skills:

1. The student is able to identify the road pavement faults and determine the probable cause of them - [K_U12]
2. The student is able to determine repair needs of road pavement and suggest the proper maintenance works for roads - [K_U12, K_U13]
3. The student is able to predict the change in time of the parameter describing the pavement condition - [K_U13]

Social competencies:

1. The student is able to work independently and as a team on the specific task - [K_K01]
2. The student is able to formulate opinions on the pavement diagnostics, technical and technological processes in the road engineering - [K_K07]
3. The student understands the need to sharing knowledge on the road pavement condition and to educate the society in the field road pavements management systems - [K_K08]

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:

9,1 - 10,0 points - A (very good)
8,1 - 9,0 points - B (good plus)
7,1 - 8,0 points - C (good)
6,1 - 7,0 points - D (satisfactory plus)
5,1 - 6,0 points - E (satisfactory)
below 5 points - F (fail)

Projects - students? skills are assessed on the basis of a projects which must be handed on last classes. 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:

Types and objective of the diagnostics of pavement. The factors having a influence on condition of road pavements: the traffic action, the atmospheric and technological factors. Genesis of road pavement faults. Diagnostics of the technical condition of pavements. Forecasting of the technical condition of pavements. Measurements of the longitudinal and cross evenness, the friction factors, the condition of pavement?s surface and the load capacity of pavements. Systems of assessment of the condition of pavement. Diagnosis of pavement as a basis of choice (option) of maintenance works. Prediction of the road pavement condition. Diagnostics of roads pavement in the existing legislation. Assessment systems of pavement condition - SOSN-B. Assessment system of roadsides and drainage condition - SOPO and system HDM-4

Projects:

Part I - description of the road pavement faults, which affect the given parameter of the technical road pavement condition with giving the probable causes of their origin (genesis)

Part II - term of the class of the road pavement condition for the given parameter and identification of the required repairs for the given section of road (diagnosis)

Part III - appointment of trend model of changes of the given parameter and choice of the term of repair (prediction)

Basic bibliography:

1. Sztukiewicz R., Diagnostyka warstwy wierzchniej podatnej nawierzchni drogowej, Drogownictwo, 1991, nr 7-8, s.113-115.
2. Płatkiewicz A., Sztukiewicz R., Zastosowanie metody prognozowania szeregów czasowych do przewidywania zmian równości poprzecznej nawierzchni asfaltowej, Pięćdziesiąta Konferencja Naukowa KILiW PAN - KN PZITB, Krynica 2004, t. V, s. 217 - 224
3. Rydzewski P., Sztukiewicz R., Diagnoza nawierzchni jako podstawa wyboru zabiegów utrzymaniowych, Autostrady, Nr 5/2007, s. 110-113.
4. Płatkiewicz A., Sztukiewicz R., Określenie horyzontu prognozy dla wybranych modeli zmian równości poprzecznej nawierzchni asfaltowej, Zeszyty Naukowe Politechniki Gdańskiej, Nr 603/2006, Pięćdziesiąta Druga Konferencja Naukowa KILiW PAN - KN PZITB, Gdańsk-Krynica 2006, t. IV, s. 239-245

Additional bibliography:

1. Sztukiewicz R., Rydzewski P., Diagnoza nawierzchni w systemie wspomagania zarządzania siecią ulic miasta Poznania, Zeszyty Naukowe Politechniki Gdańskiej,
2. Sztukiewicz R., Rydzewski P., Diagnostyka nawierzchni w systemie wspomagania zarządzania siecią ulic, Polski Kongres Drogowy, 2006, s. 259-266.

Result of average student's workload

Activity	Time (working hours)

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

Student's workload		
Source of workload	**hours**	**ECTS**
Total workload	60	3
Contact hours	40	2
Practical activities	20	1