

Title <b>Optimization in the designing roads</b>	Code <b>1010125121010120134</b>
Field <b>Transportation Engineering Extramural Second-cycle studies</b>	Year / Semester <b>1 / 2</b>
Specialty <b>Road Engineering</b>	Course <b>core</b>
Hours Lectures: <b>2</b> Classes: -    Laboratory: -    Projects / seminars: <b>25</b>	Number of credits <b>4</b>
	Language <b>polish</b>

**Lecturer:**

Dr. Andrzej Krych, e-mail: a.krych@bit-poznan.com.pl  
Dr. Jarosław Wilanowicz, e-mail: jaroslaw.wilanowicz@put.poznan.pl  
Institute of Civil Engineering, tel. 61-665-24-33

Dr. Tomasz Thiel, e-mail: tomasz.thiel@put.poznan.pl  
Institute of Building Construction, tel. 61-665-24-54  
5, Piotrowo street, 61-138 Poznań

**Faculty:**

Faculty of Civil and Environmental Engineering  
ul. Piotrowo 5  
60-965 Poznań  
tel. (061) 665-2413, fax. (061) 665-2444  
e-mail: office\_dceef@put.poznan.pl

**Status of the course in the study program:**

Special and obligatory course for students of Transportation Engineering Extramural Second-cycle studies, faculty of Civil and Environmental Engineering, speciality: Road Engineering.

**Assumptions and objectives of the course:**

Knowledge of the theoretical and practical aspects of application of optimization methods in the designing and management of roads.

Students acquire the skill of the functional, economical and safe shaping and operating transport objects, the forming flows in communication networks and the application of technique in transport policy realization.

Students come to know the usability of a objective function dependent on some numerical quantities (making decision variables) whose values may be received within limits determining collection of feasible solutions (which are for example conditional upon technological requirements concerning thickness of paving). Also students acquire the skill of calculation of minimum and maximum of objective functions.

**Contents of the course (course description):**

Multiple-criteria assistance of decision in the designing roads (education of the designing understood as a process of creation on the basis of skilful decision-making).

Economical and financial analysis for optimization of transport designs (basic aspects of the design approach to analysis, function of the sector plans, an economical and financial advantages, analysis of a risk and sensitivity). Criteria of optimization of a road network, network of streets in urban areas as well as of a public transport.

Objectives, means and methods of traffic organization. Assessment of necessity of application of road traffic signalling for junction. Criteria of traffic efficiency on an junction with road traffic signalling. Criteria of optimization of a coordination of road traffic signalling in the course of street.

Theoretical and practical methods of the solving some optimization tasks with the scope of the designing a layers system of road pavement.

**Introductory courses and the required pre-knowledge:**

**Faculty of Civil and Environmental Engineering**

Basic knowledge lectured for first-cycle studies with the scope of the designing roads, streets and junctions as well as of road materials and pavements technology, traffic engineering.  
Base of applied mathematics and physics, matrix algebra.

**Courses form and teaching methods:**

Lectures (certain part including the audio-visual aids). Design exercises

**Form and terms of complete the course - requirements and assessment methods:**

Lecture: written examination in test formality (15 test questions and 4 answers at choice in each question. Test duration: half an hour).

Assessment of design exercise being composed of several parts (stages).

**Basic Bibliography:**

**Additional Bibliography:**