

MODULE SPECIFICATION

Module code	
Module title in Polish	Inżynieria ruchu
Module title in English	Traffic Engineering
Module running from the academic year	2016/2017

A. MODULE IN THE CONTEXT OF THE PROGRAMME OF STUDY

Field of study	Civil Engineering
Level of qualification	First cycle <i>(first cycle, second cycle)</i>
Studies profile	Academic <i>(academic/practical)</i>
Mode of study	Full-time <i>(full-time / part-time)</i>
Specialism	Road Construction
Organisational unit responsible for module delivery	The Department of Transport Engineering
Module co-ordinator	Anna Chomicz-Kowalska, PhD, Eng.
Approved by	Marek Iwański, Professor

B. MODULE OVERVIEW

Module type	Core module <i>(core/programme-specific/elective HES*)</i>
Module status	Compulsory module <i>(compulsory / non-compulsory)</i>
Language of module delivery	English
Semester in the programme of study in which the module is taught	Semester 7
Semester in the academic year in which the module is taught	Winter semester <i>(winter / summer)</i>
Pre-requisites	None <i>(module code/module title, where appropriate)</i>
Examination required	No <i>(yes / no)</i>
ECTS credits	4

Mode of instruction	lectures	classes	laboratories	project	others
Total hours per semester	30		30		

* elective HES – elective modules in the Humanities and Economic and Social Sciences

C. LEARNING OUTCOMES AND ASSESSMENT METHODS

Module aims	The aim of the module is to conduct and utilise the traffic tests in planning, designing, and exploiting transport systems. Other aims include: learning the methods of analysing and assessing traffic conditions; familiarising students with the methods of organizing and controlling traffic.
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Module outcome code	Module learning outcomes	Mode of instruction (l/c/lab/p/ others)	Corresponding programme outcome code	Corresponding discipline-specific outcome code
W_01	A student knows the principles of making analyses and measurements of the conditions concerning road and pedestrian traffic.	l/l	B_W08	T1A_W03 T1A_W07 T1A_W08
W_02	A student is knowledgeable about computational methods which serve the purpose of assessing traffic conditions as regards various elements of road network.	l/l	B_W08 B_W10	T1A_W03 T1A_W04 T1A_W05 T1A_W07 T1A_W08
W_03	A student recognises and names particular elements of road network.	l	B_W12	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W07
W_04	A student has knowledge about traffic lights and programming it.	l/l	B_W12	T1A_W02 T1A_W03 T1A_W04 T1A_W05 T1A_W07
U_01	A student can analyse and assess traffic conditions for various elements of road network.	l	B_U12 B_U13	T1A_U01 T1A_U05 T1A_U07 T1A_U11 T1A_U15 T1A_U16
U_02	A student is able to plan, prepare programs, and realise the measurements of road traffic.	l	B_U12 B_U16 B_U29	T1A_U01 T1A_U03 T1A_U04 T1A_U05 T1A_U06 T1A_U07 T1A_U08 T1A_U09 T1A_U10 T1A_U11 T1A_U14 T1A_U15 T1A_U16
U_03	A student can select, apply, and interpret the learnt computational methods to assess traffic conditions.	l	B_U12	T1A_U01 T1A_U07 T1A_U08 T1A_U09 T1A_U14 T1A_U15
K_01	A student can work individually and in a team.	l	B_K01	T1A_K01 T1A_K03 T1A_K04

K_02	A student is responsible for the reliability of the obtained results.	I	B_K02	T1A_K02 T1A_K05 T1A_K07
K_03	A student formulates conclusions and describes the results of his/her own work.	I	B_K04	T1A_K01 T1A_K07

Module content:

1. Topics to be covered in the lectures

No.	Topics	Module outcome code
1	Basic notions. The tasks and aims of traffic engineering. The phases of creating the elements of transport system on the basis of the results concerning traffic examinations. Traffic types. The aims of tests, the types of measurements, and the techniques for collecting data.	W_01 W_03
2	Testing traffic intensity. The characteristics of traffic intensity. Reliable intensity values. Forecast intensity, traffic fluctuations in time; reference time (roads: 50 hours; crossroads: rush hours). The characteristics concerning traffic intensity utilised to assess the elements of traffic system elements. Speed tests.	W_01
3	Traffic capacity and levels of service. The methods of calculating capacity and assessing the conditions of road traffic. Critical intensity, capacity, ideal conditions for determining the levels of traffic freedom; the measurements of assessing traffic conditions; the factors influencing traffic conditions.	W_02
4	Computational procedures of critical intensity and capacity. The capacity of dual carriageways on standard and high-incline sections. The criteria applied to assess traffic conditions. The capacity on standard and high-incline sections. The sections of dual carriageways and multi-lane roads.	W_02
5	The classification of crossroads. Classification criteria, the types of crossroads. The range of application of the method. Basic notions utilized in the computational method.	W_03
6	The principles of determining the intensity of superior relations, boundary time distances and critical gaps of vehicles from a queue of the subordinate inlet. Computational procedure of the capacity as regards subordinate relations.	W_02
7	The impact if geometrical and movement constraints on the capacity of subordinate relations. Choking, pedestrian traffic, the location of bus stops, typological structure.	W_02
8	Lane and subordinate inlet capacity. Assessing traffic conditions on subordinate inlets. The criteria of assessing traffic conditions on traffic lanes and crossroad inlets. Capacity reserves, time losses, traffic freedom levels.	W_02
9	Crossroads with traffic lights. The criteria justifying the necessity to apply traffic lights. The classification of traffic lights.	W_04
10	Phase diagrams for time-constant two-phase, two-phase with a subphase, and multi-phase traffic lights.	W_04
11	Programming procedures concerning traffic lights. Input data, program elements connected with safety. Time losses in a cycle.	W_02
12	Programming procedures as regards traffic lights. Intensity concentration. Optimal and design cycle length.	W_02 W_04
13	The division of cycle length. The correction of cycle length. Assessing the correctness of traffic light program.	W_02 W_04
14	The procedures of calculating the capacity and assessing traffic conditions at crossroads with traffic lights.	W_02 W_04
15	A final test.	W_01 W_02 W_03 W_04

2. Topics to be covered in the classes
3. Topics to be covered in the laboratories

No.	Topics	Module outcome code
1-2	Assessing and analysing traffic conditions at a section of dual carriageway with the use of the basic procedure and the procedure applied at high-incline sections with the computational method.	W_02 U_01 U_03 K_01 K_02
3-5	Calculating intensity values of superior relations and the output capacity values of subordinate relations; the capacity of subordinate relations; road lanes and subordinate inlets at a crossroad without traffic lights.	W_02 U_03 K_01
6	Assessing and analysing traffic conditions on lanes and subordinate inlets at a crossroads without traffic lights with computational method.	W_02 U_01 U_03 K_01 K_02
7	The project of traffic lights at a crossroads. Calculating the elements of two-phase traffic lights programs.	W_02 W_04 U_03 K_01
8	Calculating inlet capacity onto a crossroads for the accepted cycle length and the division of the cycle onto phases.	W_02 W_04 U_03 K_01
9	Assessing traffic condition at crossroads inlets with the criterion of mean time losses.	W_02 U_03 K_01 K_02
10	Preparing the diagram of work as regards traffic lights.	W_04 U_03
11	Testing road traffic intensity at street crossroads. Testing pedestrian traffic at street crossroads. Preparing test program.	W_01 U_02 K_01
12-13	The realisation of the road as well as pedestrian traffic intensity at a street crossroads.	U_02 K_01
14-15	Preparing measurement results of road as well as pedestrian traffic intensity at a street crossroads.	W_01 W_02 U_02 K_01 K_02 K_03

4. Topics to be covered in the projects

Assessment methods

Module outcome code	Assessment methods <i>(Method of assessment; for module skills – reference to specific project, laboratory and similar tasks)</i>
W_01	A test
W_02	A test
W_03	A test
W_04	A test

U_01	A project and its oral defence
U_02	A project and its oral defence
U_03	A project and its oral defence
K_01	A project and its oral defence
K_02	A project and its oral defence
K_03	A project and its oral defence

C. STUDENT LEARNING ACTIVITIES

ECTS summary		
	Type of learning activity	Study time/ credits
1	Contact hours: participation in lectures	30
2	Contact hours: participation in classes	
3	Contact hours: participation in laboratories	30
4	Contact hours: attendance at office hours (2-3 appointments per semester)	10
5	Contact hours: participation in project-based classes	
6	Contact hours: meetings with a project module leader	
7	Contact hours: attendance at an examination	
8		
9	Number of contact hours	70 <i>(total)</i>
10	Number of ECTS credits for contact hours <i>(1 ECTS credit =25-30 hours of study time)</i>	2.8
11	Private study hours: background reading for lectures	10
12	Private study hours: preparation for classes	
13	Private study hours: preparation for tests	6
14	Private study hours: preparation for laboratories	4
15	Private study hours: writing reports	
16	Private study hours: preparation for a final test in laboratories	
17	Private study hours: preparation of a project/a design specification	10
18	Private study hours: preparation for an examination	
19		
20	Number of private study hours	30 <i>(total)</i>
21	Number of ECTS credits for private study hours <i>(1 ECTS credit =25-30 hours of study time)</i>	1.2
22	Total study time	100
23	Total ECTS credits for the module <i>(1 ECTS credit =25-30 hours of study time)</i>	4
24	Number of practice-based hours <i>Total practice-based hours</i>	54
25	Number of ECTS credits for practice-based hours <i>(1 ECTS credit =25-30 hours of study time)</i>	2.2