

# Study plan

**Name of study plan: navaz. mag. PRE program LA 20/21 (nová akreditace)**

Faculty/Institute/Others:

Department:

Branch of study guaranteed by the department: Welcome page

Garantor of the study branch:

Program of study: Logistics and Transport Processes Control

Type of study: Follow-up master full-time

Required credits: 120

Elective courses credits: 0

Sum of credits in the plan: 120

Note on the plan:

Name of the block: Compulsory courses

Minimal number of credits of the block: 93

The role of the block: Z

Code of the group: 1.S.NPLA 20/21

Name of the group: 1.sem.nav.prez (od) 20/21 - program LA

Requirement credits in the group: In this group you have to gain 26 credits

Requirement courses in the group: In this group you have to complete 9 courses

Credits in the group: 26

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, authors and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11LIP2	<b>Linear Programming 2</b> Ivan Nagy, Karel Je men <b>Ivan Nagy</b> Ivan Nagy (Gar.)	Z,ZK	3	2P+1C+10B	Z	z
11TER	<b>Game Theory and Optimal Decision-Making</b> Magdalena Hykšová <b>Magdalena Hykšová</b> Magdalena Hykšová (Gar.)	ZK	2	2P+0C+8B	Z	z
17LSC	<b>Logistics in Smart Cities</b> Tomáš Horák	Z,ZK	6	2P+2C+14B	Z	z
17TZND	<b>Technology of Railway Transport</b> Zdeněk Michl, Vít Janoš Vít Janoš (Gar.)	Z,ZK	4	2P+2C	Z	z
17TZOR	<b>Inventory, Replacement and Scheduling Theory</b> Dušan Teichmann Dušan Teichmann (Gar.)	Z,ZK	3	2P+1C	Z	z
14GISS	<b>Geographical Information Systems</b> František Kekula, Tomáš Janata, Zuzana Purkrábková <b>Tomáš Janata</b> Tomáš Janata (Gar.)	KZ	2	0P+2C+8B	Z	z
17MADS	<b>Management of Transport Systems</b> Roman Štěrba, Veronika Faifřová	KZ	2	2P+0C+8B	Z	z
17TSI	<b>Technology of Road Transport</b> Michal Drábek	KZ	2	2P+0C+8B	Z	z
15J2A1	<b>Language - English 1</b> Barbora Horáková, Jitka He manová, Dana Boušová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Marie Michlová, Marek Tomek, Markéta Musilová, .....	Z	2	0P+2C+10B	Z	z

**Characteristics of the courses of this group of Study Plan: Code=1.S.NPLA 20/21 Name=1.sem.nav.prez (od) 20/21 - program LA**

11LIP2	Linear Programming 2	Z,ZK	3
Formulation of the task of integer programming, branch and bound method of numerical solution, problems about knapsack, travelling salesman, sets, location of stores and post boxes, tasks of scheduling, heuristics, metaheuristics - genetic algorithms, ant colony optimization.			
11TER	Game Theory and Optimal Decision-Making	ZK	2
Decision-making theory, utility theory. Explicit form games, backward induction. Normal form games. Antagonistic conflict, matrix games. Repeated games, evolutionary game theory. Cooperative games without transferable payoffs. Cooperative games with transferable payoffs (imputation, core, Shapley value, nucleolus). Applications of game theory above all in economics and transportation.			
17LSC	Logistics in Smart Cities	Z,ZK	6
Development of cities in time, city and region, mobility of city residents and movement of goods, sustainability as a concept, Smart Cities, city as a system and its components, quality of life, individual quality of life, city "smartness" assessment, legislation in Smart Cities, Smart Cities transformation, last mile logistics, e-commerce, new approaches in last mile logistics, last mile logistics in cities and in regions.			

17TZND	Technology of Railway Transport	Z,ZK	4
Track line capacity assesment, model operational situation with a system running time between IPT-nodes, calculation of traction energy savings compared with infrastructure costs for designing of fleeting crossing station, solving of capacity problem and blocking time in relation to train protection system, robustness of timetable, system concept of freight train paths, guidelines for centralised operational traffic control and management.			
17TZOR	Inventory, Replacement and Scheduling Theory	Z,ZK	3
Inventory theory - introduction, static models, deterministic dynamic models, stochastic dynamic models. Replacement theory - introduction, models for replacement of items that deteriorate with time, models for replacement of items that fail completely. Scheduling theory - introduction, single machine scheduling problems, parallel machine scheduling problems, flow shop scheduling problems and job shop scheduling problems.			
14GISS	Geographical Information Systems	KZ	2
Construction of saving format of space-oriented information land-survey and cartography minimum basic tasks of spatial operations principles of territorial identification			
17MADS	Management of Transport Systems	KZ	2
Functions, processes and systems of management in transport, organisational structures, strategy, social responsibility, soft skills.			
17TSI	Technology of Road Transport	KZ	2
Legislative, operational, technical, logistic and safety conditions of road transport, basic transport technologies, special transport, international agreements, requirements on the parameters and specialization of transport, handling and loading/unloading means, maintenance, service and repairs of road vehicles, safety of road transport and choice of optimal transport unit.			
15J2A1	Language - English 1	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			

Code of the group: 2.S.NPLA 20/21

Name of the group: 2.sem.nav.prez (od) 20/21 - program LA

Requirement credits in the group: In this group you have to gain 24 credits

Requirement courses in the group: In this group you have to complete 8 courses

Credits in the group: 24

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) Tutors, <b>authors</b> and guarantors (gar.)	Completion	Credits	Scope	Semester	Role
11THRO	<b>Queuing Theory</b> Šárka Vorá ová <b>Šárka Vorá ová</b> Šárka Vorá ová (Gar.)	ZK	2	2P+0C+8B	L	z
17KMD	<b>Quantitative Methods in Transport</b> Dušan Teichmann, Denisa Mocková Denisa Mocková (Gar.)	Z,ZK	6	2P+2C	L	z
17MID	<b>Managerial Information Systems in Transport</b> Václav Baroch Václav Baroch (Gar.)	Z,ZK	3	2P+1C+10B	L	z
17RKOP	<b>Management of commercial projects in transport</b> Petra Skolilová, Alexandra Dvo á ková <b>Petra Skolilová</b> Petra Skolilová (Gar.)	Z,ZK	3	2P+1C+10B	L	z
14BIG	<b>Big Data</b> Jana Kaliková, Jan Kr ál <b>Jana Kaliková</b> Jana Kaliková (Gar.)	KZ	2	0P+2C+8B	L	z
14TEL	<b>Telecommunications</b> Tomáš Zelinka, Radek Holý, Zden k Lokaj, Martin Šrotý <b>Tomáš Zelinka</b> Tomáš Zelinka (Gar.)	KZ	3	2P+1C+10B	L	z
17DOCH	<b>Travel Behavior</b> Vít Janoš, Milan K íž Vít Janoš (Gar.)	KZ	3	3P+0C+10B	L	z
15JBA2	<b>Language - English 2</b> Barbora Horá ková, Jitka He manová, Dana Boušová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Marie Michlová, Marek Tome ek, Markéta Musilová, .....	Z	2	0P+2C+10B	L	z

**Characteristics of the courses of this group of Study Plan: Code=2.S.NPLA 20/21 Name=2.sem.nav.prez (od) 20/21 - program LA**

11THRO	Queuing Theory	ZK	2
Discrete event process, definition, random distribution, and probability. Basic processes, process of revitalisation. Markov process, Markov models, Kendall classification, model M/M/1, models M/M/n. Non-markovian models, model M/C/n, models G/G/n. Models with continuous flow. Service net, examples of Petri net. Computer simulation.			
17KMD	Quantitative Methods in Transport	Z,ZK	6
The course focuses on the issue of the use of undirected graphs tree type, planar graphs and their coloring. Further distribution problems, facility location problems are formulated and solved such as models of integer linear programming. Besides the use of exact methods there are described simple and also more sophisticated heuristics (metaheuristics) methods.			
17MID	Managerial Information Systems in Transport	Z,ZK	3
IT and their use in building IS of modern transport company. New EU legislation on cyber security and data protection puts transport organizations in front of new challenges. The course focuses on the security of IS and possible sources of danger. The practical part deals with the process of building a new IS from the idea through the timetable and the financial budget, the basic documents for the possible assignment of the contract.			
17RKOP	Management of commercial projects in transport	Z,ZK	3
Business project (customer, activities, output - quality, time, money), project surroundings, location of the project (area analysis, traffic flows, authorization procedure), organizational structure of the project , sources of financing, customer-supplier relations, feasibility studies, sensitivity and multi-criteria analysis, financial and value analysis, management of project changes.			
14BIG	Big Data	KZ	2
Principle of MapReduce. Basic Principles of Big Data Management. Comparison and Classification of NoSQL Databases. Key Database Value Database. Column Databases. Document Databases. Graph Databases-Basic Principles. Graph Databases-Advanced Aspects. Indexing. Interpretation. Advanced Principles Big Data Management. NewSQL Database. Cloud computing. Data warehouses and Big Data. Cloud computing. Data warehouses and Big Data. Other Big Data issues.			
14TEL	Telecommunications	KZ	3
Status quo and new trends in telecommunications systems. Economical and legal aspects of telecommunications networks design and telecommunications services provisioning, identification and quantification of hierarchical telecommunications networks and telecommunication services performance based on adopted performance parameters, telecommunication services typically applied within transport and specifically logistic solutions.			

17DOCH	Travel Behavior	KZ	3
Investigation of causal effects in travel behavior research (quasi-experimental and experimental approaches). Data collection (theory of measurement; design of research instrument and data collection). Analysis and interpretation of data (advanced regression models; issues of analysis and interpretation of results: effect size, practical vs. statistical significance). Analysis and interpr. of data (surveys, choice exp., panel. data).			
15JBA2	Language - English 2	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			

Code of the group: 3.S.NPLA 21/22

Name of the group: 3.sem.nav.prez (od) 21/22 - program LA

Requirement credits in the group: In this group you have to gain 23 credits

Requirement courses in the group: In this group you have to complete 6 courses

Credits in the group: 23

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11DOPM	Transportation Planning and Modeling	Z,ZK	6	2P+2C	Z	z
11STS	Stochastic Systems Šárka Voráková, Evžen Uglickich, Natálie Blahitka, Michal Matowicki, Pavla Pecherková <b>Pavla Pecherková</b> Šárka Voráková (Gar.)	Z,ZK	4	2P+2C+1B	Z	z
17PPC	Carriage Processes Roman Štrba	ZK	3	2P+0C	Z	z
17RVIP	Public Project Management in Transport Alexandra Dvořáková, Olga Mertlová, Daniel Pilát Olga Mertlová (Gar.)	Z,ZK	5	2P+2C+1B	Z	z
17AMAN	Application of Marketing Tools in Transport Industry Petra Skolilová Petra Skolilová (Gar.)	KZ	3	2P+0C	Z	z
15JBA3	Language - English 3 Barbora Horáková, Jiřka Hejmanová, Dana Boušová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Marie Michlová, Markéta Musilová, Eva Rezlerová	Z	2	0P+2C+10B	Z	z

Characteristics of the courses of this group of Study Plan: Code=3.S.NPLA 21/22 Name=3.sem.nav.prez (od) 21/22 - program LA

11DOPM	Transportation Planning and Modeling	Z,ZK	6
Basic steps and tools used within four step model (trip generation, trip distribution, mode choice and trip distribution). Mobility and availability in urban areas, land use. New trends for transportation planning and modelling.			
11STS	Stochastic Systems	Z,ZK	4
The subject deals with the problems of mathematical modelling of dynamical systems, estimation of these models and their utilization for prediction. The results are illustrated on practical transportation tasks. Mathematical theory roots from probability and mathematical statistics and they use the methods of the Bayesian probabilistic approach.			
17PPC	Carriage Processes	ZK	3
Domestic carriages, international carriages, nomenclature of goods, pricing, contracting, responsibility for damages.			
17RVIP	Public Project Management in Transport	Z,ZK	5
Basic concepts of project management in the public sector, used procedures and standards of project management, organizational structure in project management in the public sector, project and pre-project preparation in transport and transport infrastructure and their specifics, feasibility study and CBA, project evaluation.			
17AMAN	Application of Marketing Tools in Transport Industry	KZ	3
Strategic marketing plans. Implementation of marketing campaigns. Branding and brand promotion. Multimedia presentations. Direct marketing and related lead generation campaigns.			
15JBA3	Language - English 3	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.			

Code of the group: 4.S.NPLA 21/22

Name of the group: 4.sem.nav.prez (od) 21/22 - program LA

Requirement credits in the group: In this group you have to gain 2 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 2

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
15JBA4	Language - English 4 Barbora Horáková, Jiřka Hejmanová, Lenka Monková, Peter Morpuss, Markéta Vojanová, Marie Michlová, Markéta Musilová, Jan Feit, Eva Rezlerová	ZK	2	0P+2C+10B	L	z

Characteristics of the courses of this group of Study Plan: Code=4.S.NPLA 21/22 Name=4.sem.nav.prez (od) 21/22 - program LA

15JBA4	Language - English 4	ZK	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.			

Code of the group: XNDP LA 21/22

Name of the group: Diplomová práce program LA (od) 21/22

Requirement credits in the group: In this group you have to gain 18 credits

Requirement courses in the group: In this group you have to complete 1 course

Credits in the group: 18

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
12XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
14XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
15XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
16XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
17XNDM	Master Thesis for study programme LA <i>Tomáš Horák, Zdeněk Michl, Vít Janoš, Rudolf Vávra, Dušan Teichmann, Roman Štěrba, Veronika Faifrová, Michal Drábek, Denisa Mocková, ..... Václav Baroch (Gar.)</i>	Z	18	OP+2C+7B	L	Z
18XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
20XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
21XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
22XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z
23XNDM	Master Thesis for study programme LA	Z	18	OP+2C+7B	L	Z

Characteristics of the courses of this group of Study Plan: Code=XNDP LA 21/22 Name=Diplomová práce program LA (od) 21/22

11XNDM	Master Thesis for study programme LA	Z	18
12XNDM	Master Thesis for study programme LA	Z	18
14XNDM	Master Thesis for study programme LA	Z	18
15XNDM	Master Thesis for study programme LA	Z	18
16XNDM	Master Thesis for study programme LA	Z	18
17XNDM	Master Thesis for study programme LA	Z	18
18XNDM	Master Thesis for study programme LA	Z	18
20XNDM	Master Thesis for study programme LA	Z	18
21XNDM	Master Thesis for study programme LA	Z	18
22XNDM	Master Thesis for study programme LA	Z	18
23XNDM	Master Thesis for study programme LA	Z	18

Name of the block: Semestrální projekt

Minimal number of credits of the block: 13

The role of the block: ZP

Code of the group: XN LA 1-4 20/21

Name of the group: Projekty nav.prez.1.-4.sem (od) 20/21 programu LA

Requirement credits in the group: In this group you have to gain 13 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 13

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
11XN1	Master Project 1 <i>Ivan Nagy</i>	Z	2	OP+2C+4B	Z	ZP
12XN1	Master Project 1 <i>Zuzana Šárská, Dagmar Koňáková, Iva Šturmová, Kristýna Neubergová, Martin Jacura, Jan Kruntorád, Ondřej Třešl, David Vodák, Tomáš Javořík, .....</i>	Z	2	OP+2C+4B	Z	ZP
14XN1	Master Project 1	Z	2	OP+2C+4B	Z	ZP
15XN1	Master Project 1	Z	2	OP+2C+4B	Z	ZP
16XN1	Master Project 1 <i>Přemysl Toman</i>	Z	2	OP+2C+4B	Z	ZP

17XN1	<b>Master Project 1</b> <i>Karel Je men, Tomáš Horák, Eliška Glaserová, Zden k Michl, Vít Janoš, Rudolf Vávra, Dušan Teichmann, Veronika Faifrová, Michal Drábek, .....</i>	Z	2	0P+2C+4B	Z	ZP
18XN1	<b>Master Project 1</b> <i>Václav Rada, Nela Kr má ová</i>	Z	2	0P+2C+4B	Z	ZP
20XN1	<b>Master Project 1</b> <i>Ji í R ži ka</i>	Z	2	0P+2C+4B	Z	ZP
21XN1	<b>Master Project 1</b> <i>Jakub Kraus, Andrej Lališ, Slobodan Stoji , Terézia Pilmannová, Jakub Hospodka, Lenka Hanáková, Vladimír Socha, Peter Vittek, Lukáš Popek, .....</i>	Z	2	0P+2C+4B	Z	ZP
22XN1	<b>Master Project 1</b> <i>Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zden k Svatý, Jakub Nová ek</i>	Z	2	0P+2C+4B	Z	ZP
23XN1	<b>Master Project 1</b>	Z	2	0P+2C+4B	Z	ZP
11XN2	<b>Master Project 2</b> <i>Ivan Nagy</i>	Z	2	0P+2C+8B	L	ZP
12XN2	<b>Master Project 2</b> <i>Zuzana arská, Dagmar Ko árková, Kristýna Neubergová, Martin Jacura, Jan Kruntorád, Ond ej Trešl, David Vodák, Tomáš Javo ík, Pavel Purkart, .....</i>	Z	2	0P+2C+8B	L	ZP
14XN2	<b>Master Project 2</b> <i>Vít Fábera, Tomáš Brandejský, Mária Jánešová, Jan Zelenka</i>	Z	2	0P+2C+8B	L	ZP
15XN2	<b>Master Project 2</b>	Z	2	0P+2C+8B	L	ZP
16XN2	<b>Master Project 2</b> <i>P emysl Toman, Josef Mík</i>	Z	2	0P+2C+8B	L	ZP
17XN2	<b>Master Project 2</b> <i>Tomáš Horák, Zden k Michl, Vít Janoš, Rudolf Vávra, Dušan Teichmann, Roman Št rba, Veronika Faifrová, Michal Drábek, Denisa Mocková, ..... Vít Janoš (Gar.)</i>	Z	2	0P+2C+8B	L	ZP
18XN2	<b>Master Project 2</b> <i>Daniel Kytý</i>	Z	2	0P+2C+8B	L	ZP
20XN2	<b>Master Project 2</b> <i>Ji í R ži ka, Patrik Horaž ovský</i>	Z	2	0P+2C+8B	L	ZP
21XN2	<b>Master Project 2</b> <i>Jakub Kraus, Andrej Lališ, Slobodan Stoji , Terézia Pilmannová, Jakub Hospodka, Lenka Hanáková, Peter Vittek, Jakub Steiner, Natalia Guskova, .....</i>	Z	2	0P+2C+8B	L	ZP
22XN2	<b>Master Project 2</b> <i>Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zden k Svatý, Jakub Nová ek</i>	Z	2	0P+2C+8B	L	ZP
23XN2	<b>Master Project 2</b>	Z	2	0P+2C+8B	L	ZP
11XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
12XN3	<b>Master Project 3</b> <i>Zuzana arská, Dagmar Ko árková, Martin Jacura, Jan Kruntorád, Ond ej Trešl, David Vodák, Tomáš Javo ík, Pavel Purkart, Lukáš Týfa, .....</i>	Z	1	0P+4C	Z	ZP
14XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
15XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
16XN3	<b>Master Project 3</b> <i>P emysl Toman, Josef Mík, Michal Cenknér, Josef Svoboda</i>	Z	1	0P+4C	Z	ZP
17XN3	<b>Master Project 3</b> <i>Karel Je men, Tomáš Horák, Eliška Glaserová, Zden k Michl, Vít Janoš, Rudolf Vávra, Dušan Teichmann, Veronika Faifrová, Michal Drábek, .....</i>	Z	1	0P+4C	Z	ZP
18XN3	<b>Master Project 3</b> <i>Daniel Kytý</i>	Z	1	0P+4C	Z	ZP
20XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
21XN3	<b>Master Project 3</b> <i>Terézia Pilmannová, Miloš Strouhal</i>	Z	1	0P+4C	Z	ZP
22XN3	<b>Master Project 3</b> <i>Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zden k Svatý, Tomáš Mi unek</i>	Z	1	0P+4C	Z	ZP
23XN3	<b>Master Project 3</b>	Z	1	0P+4C	Z	ZP
11XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP
12XN4	<b>Master Project 4</b> <i>Zuzana arská, Dagmar Ko árková, Kristýna Neubergová, Martin Jacura, Jan Kruntorád, Ond ej Trešl, David Vodák, Tomáš Javo ík, Pavel Purkart, .....</i>	Z	8	0P+4C	L	ZP
14XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP
15XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP
16XN4	<b>Master Project 4</b> <i>Josef Mík, Michal Cenknér</i>	Z	8	0P+4C	L	ZP
17XN4	<b>Master Project 4</b> <i>Tomáš Horák, Zden k Michl, Vít Janoš, Rudolf Vávra, Dušan Teichmann, Roman Št rba, Veronika Faifrová, Michal Drábek, Denisa Mocková, ..... Václav Baroch (Gar.)</i>	Z	8	0P+4C	L	ZP
18XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP
20XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP

21XN4	<b>Master Project 4</b> <i>Slobodan Stojić, Terézia Pilmannová, Vladimír Socha, Peter Vittek, Jakub Steiner, Miloš Strouhal, Ota Hajzler, Iveta Kameníková, Petr Lukeš, .....</i>	Z	8	0P+4C	L	ZP
22XN4	<b>Master Project 4</b> <i>Michal Frydřín, Karel Kocián, Luboš Nouzovský, Zdeněk Svátý</i>	Z	8	0P+4C	L	ZP
23XN4	<b>Master Project 4</b>	Z	8	0P+4C	L	ZP

**Characteristics of the courses of this group of Study Plan: Code=XN LA 1-4 20/21 Name=Projekty nav.prez.1.-4.sem (od) 20/21 programu LA**

11XN1	Master Project 1	Z	2
12XN1	Master Project 1	Z	2
14XN1	Master Project 1	Z	2
15XN1	Master Project 1	Z	2
16XN1	Master Project 1	Z	2
17XN1	Master Project 1	Z	2
18XN1	Master Project 1	Z	2
20XN1	Master Project 1	Z	2
21XN1	Master Project 1	Z	2
22XN1	Master Project 1	Z	2
23XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
12XN2	Master Project 2	Z	2
14XN2	Master Project 2	Z	2
15XN2	Master Project 2	Z	2
16XN2	Master Project 2	Z	2
17XN2	Master Project 2	Z	2
18XN2	Master Project 2	Z	2
20XN2	Master Project 2	Z	2
21XN2	Master Project 2	Z	2
22XN2	Master Project 2	Z	2
23XN2	Master Project 2	Z	2
11XN3	Master Project 3	Z	1
12XN3	Master Project 3	Z	1
14XN3	Master Project 3	Z	1
15XN3	Master Project 3	Z	1
16XN3	Master Project 3	Z	1
17XN3	Master Project 3	Z	1
18XN3	Master Project 3	Z	1
20XN3	Master Project 3	Z	1
21XN3	Master Project 3	Z	1
22XN3	Master Project 3	Z	1
23XN3	Master Project 3	Z	1
11XN4	Master Project 4	Z	8
12XN4	Master Project 4	Z	8
14XN4	Master Project 4	Z	8
15XN4	Master Project 4	Z	8
16XN4	Master Project 4	Z	8
17XN4	Master Project 4	Z	8
18XN4	Master Project 4	Z	8
20XN4	Master Project 4	Z	8
21XN4	Master Project 4	Z	8
22XN4	Master Project 4	Z	8
23XN4	Master Project 4	Z	8

Name of the block: Compulsory elective courses

Minimal number of credits of the block: 6

The role of the block: PV

Code of the group: Y2-NPLA 20/21

Name of the group: PVP nav.prez. program LA 20/21

Requirement credits in the group: In this group you have to gain 6 credits

Requirement courses in the group: In this group you have to complete 3 courses

Credits in the group: 6

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
17Y2AM	<b>Application of Marketing Tools in Transportation</b>	KZ	2	2P+0C	L	PV
12Y2BM	<b>Safety on The Local Roads</b>	KZ	2	2P+0C	Z	PV
23Y2BP	<b>Security Class</b> <i>Zuzana Kosová</i>	KZ	2	2P+0C	Z	PV
21Y2BS	<b>Unmanned aircraft systems 2</b> <i>Tomáš Tluhoš, Michal Černý</i>	KZ	2	2P+0C	L	PV
14Y2C1	<b>CATIA I</b>	KZ	2	2P+0C	L	PV
14Y2C2	<b>CATIA II</b>	KZ	2	2P+0C	Z	PV
14Y2CS	<b>Sensitivity of Systems</b>	KZ	2	2P+0C	L	PV
12Y2DU	<b>Transport in the Context of Sustainability</b> <i>Kristýna Neubergová</i>	KZ	2	2P+0C	L	PV
15Y2DN	<b>Transportation Psychology in German Speaking Countries</b>	KZ	2	2P+0C	L	PV
18Y2DC	<b>Dynamics of Transport Routes and Vehicles</b>	KZ	2	2P+0C	Z	PV
16Y2EE	<b>Emissions and Ergonomics of Vehicles</b>	KZ	2	2P+0C	L	PV
17Y2FM	<b>Financing in Urban Mass Transportation</b> <i>Václav Baroch</i>	KZ	2	2P+0C	Z	PV
11Y2FX	<b>Functions of Complex Variable</b>	KZ	2	2P+0C	Z	PV
23Y2FB	<b>Physics for Security Branches</b>	KZ	2	2P+0C	Z	PV
18Y2FZ	<b>Physical foundation of materials' properties</b> <i>Jaroslav Valach</i>	KZ	2	2P+0C	L	PV
15Y2HS	<b>Road Transport History</b> <i>Eva Rezlerová, Zuzana Čarská</i>	KZ	2	2P+0C	L	PV
16Y2HP	<b>Vehicle Hygiene</b>	KZ	2	2P+0C	L	PV
14Y2IS	<b>Intelligent Systems in Postal Services</b>	KZ	2	2P+0C	L	PV
12Y2IS	<b>Urban Networks</b>	KZ	2	2P+0C	Z	PV
14Y2JM	<b>One-Chip Controllers</b>	KZ	2	2P+0C	Z	PV
15Y2JH	<b>Job Hunting in English</b> <i>Lenka Monková</i>	KZ	2	2P+0C	Z	PV
14Y2KI	<b>Capital Investment in Transportation and Telecommunications</b>	KZ	2	2P+0C	L	PV
16Y2KV	<b>Car Body Design</b>	KZ	2	2P+0C	L	PV
12Y2KS	<b>Rail Transport in Settlements and Regions</b> <i>Miroslav Veliš</i>	KZ	2	2P+0C	Z	PV
12Y2KE	<b>Landscape Ecology</b> <i>Kristýna Neubergová</i>	KZ	2	2P+0C	Z	PV
21Y2LS	<b>Air Traffic Services</b>	KZ	2	2P+0C+8B	L	PV
11Y2LG	<b>Logics of Engineer's Judgement</b>	KZ	2	2P+0C	L	PV
23Y2MA	<b>Risk Analysis and Management</b>	KZ	2	2P+0C	L	PV
15Y2MS	<b>Sociology for Managers</b> <i>Martina Šmidochová</i>	KZ	2	2P+0C	Z	PV
12Y2MH	<b>Measurement and Modeling of Traffic Noise</b>	KZ	2	2P+0C	L	PV
12Y2MI	<b>Urban Engineering</b>	KZ	2	2P+0C	L	PV
18Y2MP	<b>Finite Element Method And Its Application</b> <i>Radek Kolman</i>	KZ	2	2P+0C	L	PV
16Y2MK	<b>Quality Methods for Vehicles</b>	KZ	2	2P+0C	L	PV
12Y2MD	<b>Methods of Traffic Regulation and Prediction</b> <i>Zuzana Čarská</i>	KZ	2	2P+0C	L	PV
17Y2MO	<b>International Organisations in Transportation</b>	KZ	2	2P+0C	L	PV
17Y2MS	<b>Microsimulation of Railway Operation</b> <i>Zdeněk Michl</i>	KZ	2	2P+0C	Z	PV
21Y2MS	<b>Aerospace Engineering Simulation and Modelling</b>	KZ	2	2P+0C	Z	PV
17Y2MT	<b>Modern History for Engineering Students</b> <i>Tomáš Horák, Petra Skolilová</i>	KZ	2	2P+0C	Z	PV
12Y2MZ	<b>Modernization of Railway Lines and Stations</b> <i>Dagmar Koňáková, Miroslav Veliš</i>	KZ	2	2P+0C	L	PV
14Y2OP	<b>Object Oriented Programming in Transport</b>	KZ	2	2P+0C	L	PV
15Y2OZ	<b>Health Protection in Transportation and EU</b> <i>Eva Rezlerová, Petr Musil</i>	KZ	2	2P+0C	Z	PV
15Y2OF	<b>Specialised French for Transportation and Telecommunications</b>	KZ	2	2P+0C	Z	PV

18Y2OB	<b>Optical Contactless Strain Measurements</b> <i>Petr Zlámal</i>	KZ	2	2P+0C	L	PV
16Y2PG	<b>Computer Graphics and Virtual Reality</b> <i>Stanislav Novotný, Petr Bouchner</i>	KZ	2	2P+0C	Z	PV
22Y2PS	<b>Traffic Accidents Computer Simulation and Analysis</b>	KZ	2	2P+0C	L	PV
15Y2PT	<b>Food in Transportation</b> <i>Eva Rezlerová, Petr Musil</i>	KZ	2	2P+0C	L	PV
23Y2PD	<b>Practical vehicle dynamics</b>	KZ	2	2P+0C	L	PV
15Y2PD	<b>Practical Spanish for Transportation</b>	KZ	2	2P+0C	Z	PV
21Y2PP	<b>Law and Operation in Air Transport</b> <i>Radoslav Zozuák</i>	KZ	2	2P+0C+8B	L	PV
20Y2PR	<b>Prediction of time series</b>	KZ	2	2P+0C	L	PV
14Y2PI	<b>Process Information Systems in Transportation</b>	KZ	2	2P+0C	Z	PV
14Y2PJ	<b>C++ Programming Language</b>	KZ	2	2P+0C	L	PV
14Y2PH	<b>CAD Interface Programming</b>	KZ	2	2P+0C	L	PV
11Y2PM	<b>Programming in MATLAB</b> <i>Šárka Vorávková</i>	KZ	2	2P+0C	L	PV
21Y2PL	<b>Operational Aspects of Aerodromes</b>	KZ	2	2P+0C	Z	PV
17Y2PS	<b>Case Studies in Transportation</b>	KZ	2	2P+0C	Z	PV
15Y2PU	<b>Publications and Their Creation</b>	KZ	2	2P+0C	Z	PV
12Y2RD	<b>Realization of Transport Buildings</b> <i>Dagmar Koárková, Martin Höfler, Tomáš Honc</i>	KZ	2	2P+0C	L	PV
17Y2RZ	<b>Control of Transport Processes</b>	KZ	2	2P+0C	Z	PV
21Y2S1	<b>Diploma Thesis Seminar 1</b>	KZ	2	2P+0C	L	PV
21Y2S2	<b>Diploma Thesis Seminar 2</b>	KZ	2	2P+0C	Z	PV
15Y2SP	<b>Seminar on Political Philosophy</b>	KZ	2	2P+0C	Z	PV
17Y2SJ	<b>Network Timetabling on the Railway</b> <i>Vít Janoš Vít Janoš (Gar.)</i>	KZ	2	2P+0C	L	PV
16Y2ST	<b>Special Technologies in Transport and Telecommunications</b>	KZ	2	2P+0C	L	PV
16Y2SV	<b>Special technologies in vehicle manufacturing</b>	KZ	2	2P+0C	L	PV
18Y2SD	<b>Reliability and Diagnostics, Experimental Methods</b> <i>Daniel Kytý</i>	KZ	2	2P+0C	Z	PV
15Y2SR	<b>Stylistics and Rhetorics</b>	KZ	2	2P+0C	Z	PV
17Y2SK	<b>Urban and Regional Rail Transport System</b>	KZ	2	2P+0C	L	PV
15Y2TS	<b>Technician and Contemporary Society</b> <i>Jan Feit, Eva Rezlerová</i>	KZ	2	2P+0C	L	PV
20Y2TE	<b>Technology of Electronic Systems</b>	KZ	2	2P+0C	Z	PV
14Y2TU	<b>Telecommunications Systems and Multimedia</b>	KZ	2	2P+0C	Z	PV
16Y2TT	<b>Transportation and Building Technology and Equipment</b>	KZ	2	2P+0C	Z	PV
23Y2TP	<b>Creation of legal and technical regulations</b>	KZ	2	2P+0C	L	PV
12Y2UD	<b>Sustainable Transportation</b>	KZ	2	2P+0C	L	PV
14Y2UI	<b>Artificial Intelligence</b>	KZ	2	2P+0C+8B	Z,L	PV
20Y2UA	<b>Artificial Neural Networks, Realization and Applications</b>	KZ	2	2P+0C	Z	PV
18Y2UB	<b>Accident Biomechanics and Safety</b>	KZ	2	2P+0C	L	PV
23Y2VZ	<b>Leadership and Human Resource Development</b>	KZ	2	2P+0C	L	PV
18Y2VC	<b>Computational Mechanics in Transportation</b> <i>Radek Kolman</i>	KZ	2	2P+0C	L	PV
23Y2VR	<b>Cope with Risks in Engineering Branches</b> <i>Danuše Procházková</i>	KZ	2	2P+0C		PV
12Y2VT	<b>High Speed Railways</b>	KZ	2	2P+0C	Z	PV
12Y2ZK	<b>Traffic Calming</b> <i>Zuzana arská</i>	KZ	2	2P+0C	Z	PV
23Y2ZM	<b>Intelligence Means and Methods</b> <i>Miloslav Kuera</i>	KZ	2	2P+0C	Z	PV

**Characteristics of the courses of this group of Study Plan: Code=Y2-NPLA 20/21 Name=PVP nav.prez. program LA 20/21**

17Y2AM	Application of Marketing Tools in Transportation	KZ	2
Application of marketing principles in transport issues, marketing tools suitable for transport, case studies of the use of marketing in the sphere of public passenger transport.			
12Y2BM	Safety on The Local Roads	KZ	2
Classification of road accidents rates, social losses. Collision points, diagrams. Tools and methods for safer road transportation. Crossroads from the point of view of safety. Psychological right of way. Roundabouts. Pedestrian transport, cyclists. Traffic lights coordination. Transport control and regulation.			
23Y2BP	Security Class	KZ	2
The most prevalent topics include data management, data and text mining applications, terrorism informatics, deception and intent detection, terrorist and criminal social network analysis, crime analysis, cyber-infrastructure protection, transportation infrastructure security, and information assurance, among others.			



21Y2BS	Unmanned aircraft systems 2	KZ	2
Modern trends in unmanned aircraft development. Use of unmanned aircraft. Managerial activities related to the operation of unmanned aircraft. Flights beyond the applicable legislation.			
14Y2C1	CATIA I	KZ	2
Fundamentals of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric structure, parametric linking, making adaptive models from 2D sketches. Import and export of made parts and bodies. Making assemble and visualization.			
14Y2C2	CATIA II	KZ	2
Extension of basic course. Modeling compound bodies. Possibility of enumeration, communications with other systems. Surface x solid bodies. Kinematic mechanism. Project making and project cooperation. Outputs of projects.			
14Y2CS	Sensitivity of Systems	KZ	2
Design of systems with defined reliability. The impact of changing parameters and subsystems within a system. System sensitivity computing, definition of sensitivity functions and matrices and their usability in system design.			
12Y2DU	Transport in the Context of Sustainability	KZ	2
Definitions of sustainable transport, historical context, development in our country and in the world. Sustainable development and sustainable transport. Demand for transport. Induction of transport. Examples of sustainable transport. Biofuels. Electromobility. New trends in transport. Practical examples.			
15Y2DN	Transportation Psychology in German Speaking Countries	KZ	2
Introduction into broader view of traffic problems with regard to the work with texts (Physics for drivers, abusing alcohol during driving, exhaustion, getting of driving licence, children in traffic, traffic accident, traffic psychology in the internet etc.)			
18Y2DC	Dynamics of Transport Routes and Vehicles	KZ	2
Basic theory and calculations of more mass systems. Analysis of the forces acting between the vehicle and transport route. Creation of dynamic models of vehicles and transport routes. Vibration of systems with a finite number of degrees of freedom. Methods of stiffness constants and pliability constants. Fundamentals of vibration of bridges. Criteria for the admissibility of oscillation. Experimental methods in dynamics.			
16Y2EE	Emissions and Ergonomics of Vehicles	KZ	2
Emissions and ergonomics of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomics - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredness.			
17Y2FM	Financing in Urban Mass Transportation	KZ	2
UMT history and development in Prague and other cities in the world. Building and operation of public tram, bus, and trolleybus networks. Underground building and operation. Other UMT types. UMT development in small towns. Particularities of investment and operation financing of individual UMT types. Historic and present models of UMT financing. Transport inspection and blind passengers. Tourism & UMT. UMT typology & choice of optimum financing.			
11Y2FX	Functions of Complex Variable	KZ	2
Derivation of complex function, holomorphic function, complex exponential series, integration, Cauchy theorem. Taylor series, Laurent series of complex variable function. Basics of Laplace and Z-transformation.			
23Y2FB	Physics for Security Branches	KZ	2
Grounds of physics of substances and phenomena at extreme conditions. Grounds of rheology. Physics of Earth's interior. Geophysics. Physics of atmosphere. Applications in engineering branches directed to safety.			
18Y2FZ	Physical foundation of materials' properties	KZ	2
Atomistic models, lattice defects influence on properties of materials, stiffness, plasticity, strength, fracture, fatigue, creep, corrosion, effects of environment and loading on materials' behavior are the main discussed topics.			
15Y2HS	Road Transport History	KZ	2
Roads and road traffic in the Ancient Age, corridors of main medieval pathways. Development of road traffic in the modern period, acceleration of road transport development during 1st part of 20th century. Development of road layout, geometric and construction layers. Beginning of modern road civil engineering. Development of road travelling in modern period. History of road interconnections, bridges and traffic control, development of road signs.			
16Y2HP	Vehicle Hygiene	KZ	2
Emissions and ergonomics of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomics - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredness.			
14Y2IS	Intelligent Systems in Postal Services	KZ	2
The use of information systems in the postal services (ITIS, and POST, T + T, PS, KMP, DS), application of information technology in the processing of mail processing nodes in the postal network, optimizing logistics processes in the post. The appreciation of the real implementation of the Czech post in operation both in lectures and in the framework of the practical desk.			
12Y2IS	Urban Networks	KZ	2
The importance and the position of UN as public and technical infrastructure / utilities, methodology of the UN master planning, of UN design, UN coordination, UN installation and UN operation (basic technical standards of UN, trenchless technologies for UN).			
14Y2JM	One-Chip Controllers	KZ	2
One-chip controllers architecture, embedded peripherals (counters, timers, converters, ports) and their utilisation. Practical tasks are programmed with the aid of AVR chips.			
15Y2JH	Job Hunting in English	KZ	2
The course provides a practical guide to applying for a job in English. The interview process is mapped out, with the course including skills practise for all the stages of this process, including specifics for job-hunting in English. Students will also be introduced to the English vocabulary and phraseology necessary for a successful interview.			
14Y2KI	Capital Investment in Transportation and Telecommunications	KZ	2
Financial market, investment decision making - long term goals and investment strategies, long term financing			
16Y2KV	Car Body Design	KZ	2
Personal cars body, high-load car body, bus car body, and motorcycle as a construction set. Principles of design, production, testing and operation. Materials used for car body construction. Active and passive safety parts. Ergonomics, HMI, view out of the vehicle, operational extent, view behind the car. Conditioning tools, signaling function. Aerodynamics of the car body. Design and artistic design principles. Practical training.			
12Y2KS	Rail Transport in Settlements and Regions	KZ	2
Modernization and development of railway infrastructure in Czech Republic. Arrangement of railway networks and junctions. Suburban railway services. Network configuration and operation of metro systems. Network configuration and operation of tram systems. Special thematic lectures (rail transport in selected countries / regions).			
12Y2KE	Landscape Ecology	KZ	2
Landscape ecology. Landscape - definition, types, evolution. Landscape systems. Anthropogenic impacts on landscape. Methods using for evaluating landscape. Fractal geometry and its potential applications in landscape ecology. Landscape planning.			

21Y2LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training Systém of Air Traffic Controllers. Future development of ATS.			
11Y2LG	Logics of Engineer's Judgement	KZ	2
Logical structure of engineer's judgement, its propositional and predicative logical base. Solutions of logical tasks through the methods of truthfulness and semantic analysis charts. Venn's diagram method. Logical basis for network design for the solution of technical tasks.			
23Y2MA	Risk Analysis and Management	KZ	2
Concept of risks and terms. Risk sources, definition of hazard, impacts and risks. Methods for identification, analysis, assessment and management of risks. Risk engineering targets and good engineering practice. Methods, tools and techniques for risk engineering. System of systems risk. Application of strategic and system approach for benefit of security and development. Territorial, emergency and crisis planning. Human factor - its role.			
15Y2MS	Sociology for Managers	KZ	2
Sociological approach to a corporation. Corporation and its organization. Corporation and its running - human role and communication. Corporation, its culture and social system. Human's work position in free market economy. Corporate directorship, work groups, adaptation, strife, different roles and positions in corporation.			
12Y2MH	Measurement and Modeling of Traffic Noise	KZ	2
Theoretical introduction to noise from traffic. Noise from rail transport. Noise from road traffic. Measurement and calculation of noise from rail traffic. Measurement and calculation of noise from road traffic. Modelling of traffic noise in the CADNA A.			
12Y2MI	Urban Engineering	KZ	2
Teaching aiming on utilities storage in area, coordination engineering activities in area, arrangement of public space, conception of public spaces.			
18Y2MP	Finite Element Method And Its Application	KZ	2
Basic mathematical formulation of the Finite Element Method. Direct Stiffness Method used in structural mechanics. Evaluation of stiffness matrices for the basic elements using variational principles. Element formulation (bar and beam elements, CST, LST, quadrilateral, tetrahedral and brick elements). Natural coordinates, natural shape functions and isoparametric representation. Numerical integration. Introduction to dynamics. FEM programming.			
16Y2MK	Quality Methods for Vehicles	KZ	2
Quality management methods list, customer data acquisition and analysis of customer requirements, QFD, DFM, DFA, DFS. FMEA (Failure mode effect analysis). Elements of parallel (team) design.			
12Y2MD	Methods of Traffic Regulation and Prediction	KZ	2
Basic ways of traffic prognosis, traffic prognosis for large area (calculation of future traffic volumes, calculation of future traffic volumes between areas (analogical and synthetic methods, modal split, traffic distribution to road network). Shock wave in traffic flow. Service levels and their traffic volumes. Acceleration noise.			
17Y2MO	International Organisations in Transportation	KZ	2
International relations in transport, UN, EEC UN, Intergovernmental organisations, EU Offices and Agencies, Conference of European Ministries of transport, International mode organisations of public transport, Air-Rail, railways, roads, air, waterways, forwarding and postal services.			
17Y2MS	Microsimulation of Railway Operation	KZ	2
Introduction to the characteristics of simulation tools, creation of a simulation model of railway infrastructure, verification of a specific operational concept on the given infrastructure, adaptation of the infrastructure model and modification to the infrastructure to allow the implementation of the proposed operational concept. Stability tests and evaluations. Evaluation of sensitivity of the operational concept to delays.			
21Y2MS	Aerospace Engineering Simulation and Modelling	KZ	2
The course is designed as a set of exemplary tasks and problems based on practical aviation issues. The university degree mathematic skills and software applications usage will be necessary for successful figuring out. Both simple tasks, where students create own model themselves (e.g. in Matlab), and more complicated problems where professional developed tools will be applied.			
17Y2MT	Modern History for Engineering Students	KZ	2
Selected chapters from the 19. century history. Geopolitical situation in Europe explained on the examples of Great Britain, Germany and Austrian Empire. Rise of the United States, American Civil War, transatlantic transportation development. Imperial China: Late Qing dynasty. Selected chapters from the 20. century history: From Belle Epoque to Cold War. Czechoslovak historical myths.			
12Y2MZ	Modernization of Railway Lines and Stations	KZ	2
Line speed increasing. AGC and AGTC Agreement. AGC and AGTC railway network. Principles of modernization (conceptual papers, definitions of basic concepts, individual principles). Track geometrical characteristics on modernized railway lines. Superstructure and substructure on upgraded lines. Designing of railway stations. Bridges and tunnels. Development and realization of projects. Technical description of the transit corridors.			
14Y2OP	Object Oriented Programming in Transport	KZ	2
Class, object, encapsulation, inheritance, polymorphism, templates, retyping, stream, exceptions, repository, collections, virtual methods and classes. Problem cases will be chosen from microscopic simulation system, discrete event simulation, cellular automata simulation and virtual life area.			
15Y2OZ	Health Protection in Transportation and EU	KZ	2
Health protection in transportation in CR in the past and present. Conditions before 1989 and after, current legislature, future prospects. Harmonisation of legislation with other EU members. Fundamental principles of health protection and support in selected EU countries.			
15Y2OF	Specialised French for Transportation and Telecommunications	KZ	2
Basic transportation (public transport, railway, air, road and ship transport) and telecommunications terminology. Special focus on independent speaking and writing skills.			
18Y2OB	Optical Contactless Strain Measurements	KZ	2
In the course students will get theoretical knowledge and practical experience in optical strain measurement methods. Students will get experience with use of laboratory cameras, DSLRs and high speed cameras for acquisition of suitable image data and with digital image correlation algorithms for displacements measurements and strain fields calculation.			
16Y2PG	Computer Graphics and Virtual Reality	KZ	2
Principles of creation and processing of bitmap and vector 2D graphics, 3D virtual scenes and algorithms used for their computerized processing. Adopting skills of work with professional and freeware tools for creation and processing of 2D, 3D and interactive graphics, and basics of programming language VRML and graphic libraries (OpenGL).			
22Y2PS	Traffic Accidents Computer Simulation and Analysis	KZ	2
Vehicle dynamics simulation, multi body systems and vehicle active safety systems, vehicle slipping, external influence on virtual model, crash tests evaluation, single-track vehicle, vehicle passengers, pedestrian, traffic accident simulation and analysis.			
15Y2PT	Food in Transportation	KZ	2
The nutrition policy. Interaction transportation and foodstuffs. The health risks. Hygienic safeguard. The practical examples from the Czech Republic and from the world. The issues of dining cars, work trains and other railroad equipment. Legislation.			
23Y2PD	Practical vehicle dynamics	KZ	2
Theory of vehicle dynamics. Multibody vehicle modeling. Modeling with IPG CarMaker. Standard and development stage experiments with road vehicles. Realization of experimental measurements with passenger vehicles. Experiment evaluation.			

15Y2PD	Practical Spanish for Transportation	KZ	2
Development of communication skills, training of correct written expression of formal character, basic technical vocabulary, cultural specifics of the Spanish speaking countries. Terminology of transport and commerce.			
21Y2PP	Law and Operation in Air Transport	KZ	2
Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods.			
20Y2PR	Prediction of time series	KZ	2
Introduction to time series prediction, meaning of prediction, basics of quantitative prediction. Methods for predictive quality evaluation, descriptive statistics, MAE, MAPE, RMSE, naive prediction, prediction for general formula of loss function. Calculation and programming environment R. Regression models, basics of linear regression, simple regression. Multiple regression, statistical tests of linear dependence, selection of input variables.			
14Y2PI	Process Information Systems in Transportation	KZ	2
Introduction and detailed usage of transport information systems, e.g. EFC, ePurse and transport check-in systems for public transport with focus on architecture of this system and SOA (Service Oriented Architecture). Information systems implementation and operations description in the Czech Republic (technical and process) included lectures and visits.			
14Y2PJ	C++ Programming Language	KZ	2
OOP philosophy and basics of C++ programming language. Class, object, constructor, destructor, inheritance, abstract class, virtual methods, exceptions, streams, method and operator overloading, abstract data type implementation in C++.			
14Y2PH	CAD Interface Programming	KZ	2
Introduction to CAD interface programming techniques with the help of LIST and VBA programming languages. Possibilities of proper objects (commands), dialogues, interfaces, and applications creation in CAD systems. Programming of cooperation with other applications (databases, spread-sheets).			
11Y2PM	Programming in MATLAB	KZ	2
To explain the principle of modelling and simulation, description of Matlab environment and its settings, optimization and program code debugging, data fitting and designing GUI in Matlab.			
21Y2PL	Operational Aspects of Aerodromes	KZ	2
Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and terminals. Operation under winter conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection.			
17Y2PS	Case Studies in Transportation	KZ	2
Simulation expert discussions on the topics - the impact of transport on the environment and the economy, energy, construction of transport infrastructure etc. The students will each lesson presented one current and the real issue, which solutions will have to think of each other. Each of them will be represent another role (public authorities, investors, carrier representative interest groups, residents, etc.).			
15Y2PU	Publications and Their Creation	KZ	2
Scientific texts types. Footnotes and references. Exploration of facts. Quotations. Formal document layout. Working with information databases. Typographic principles. Typographic editors - MS Word, Tex/LaTeX. Practical creation of simple scientific documents.			
12Y2RD	Realization of Transport Buildings	KZ	2
Transport Buildings Types. Project Documentation Types. Building Code. Land Permission and Building Permission Process. Building Process. Project Economics. Project Management.			
17Y2RZ	Control of Transport Processes	KZ	2
Theoretical bases, transport system, decomposition, factors influencing control, quality diagnosis, methods of control, systems for decision making support, risk of decision making, telematics.			
21Y2S1	Diploma Thesis Seminar 1	KZ	2
Types of final theses (review, applied research, basic research, work dealing with design proposals). Working with citation sources (citation databases, citation styles). Analysis of the current state (writing standards). Definition of the limitations of the current state. Introduction to the methodology of writing final theses.			
21Y2S2	Diploma Thesis Seminar 2	KZ	2
Methodology of writing final theses. Definition of materials and methods, approach to obtaining results, presentation and discussion of results, formulation of conclusions. Data collection and presentation, basic statistics, validation of results and proposals. Achieving the objectives of the paper and evaluation of hypotheses tests. Formal and graphic design of the paper - working with LaTeX and Word template.			
15Y2SP	Seminar on Political Philosophy	KZ	2
Interpreting of philosophical texts, view of society, state and their system of government.			
17Y2SJ	Network Timetabling on the Railway	KZ	2
Timetable samples. Capacity allocation, technological intervals in railway operation. Rules and regulations of train paths, running times, time adds and supplements. Rolling stock circulation planning. Rules of train-diagramm creating. Timetables for more service-levels on the line. Construction slot conflicts between passenger- and freight transport. Network line relations and waiting times, timetables for lines under construction.			
16Y2ST	Special Technologies in Transport and Telecommunications	KZ	2
Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas.			
16Y2SV	Special technologies in vehicle manufacturing	KZ	2
Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas.			
18Y2SD	Reliability and Diagnostics, Experimental Methods	KZ	2
The course is focused on theoretical background and practical experience in the field of reliability of constructions, implementation of diagnostic procedures for the detection of material defects and determination of residual life of structures. For this purpose, non-destructive methods of experimental mechanics (e. g. strain-gauge measurement, photoelasticimetry) and optical methods, including electron microscopy, will be used.			
15Y2SR	Stylistics and Rhetorics	KZ	2
Basic skills of oral and written expression as a means of human communication. Basic information about speech, articulation, oral and written language. Teaching to speak well-vocal organs, voice training. Language semantics, language syntactic and the pragmatic aspect. Creative thought and its oral and written expression. Practice - cultivating the skills of speech.			
17Y2SK	Urban and Regional Rail Transport System	KZ	2
Factors influencing transport demand, modal-split, traffic flows distribution on public transit network. Line network optimization and configuration. Timetable designing and evaluation accenting integrated periodic timetable. Rolling stock circulation, staff and crew services optimization and their order to rosters. Framework legislation, non-barrier effects and preference of public transport. Marketing.			
15Y2TS	Technician and Contemporary Society	KZ	2
Why to take off a hat in a room and open a door for a lady, are there simple solutions, science vs belief, do we need to know or is it enough to turn on a PC, it must be true - it's on the Internet and in newspapers, what are the sights for, interest in public affairs - a hangover from the past?			

20Y2TE	Technology of Electronic Systems	KZ	2
Principle technologies for an effective operation of electronically controlled systems. Maintaining, measuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologies users and operators.			
14Y2TU	Telecommunications Systems and Multimedia	KZ	2
New trends in telecommunications namely applied in transport solutions, identification and quantification of telecommunications networks and services performance based on redundant architecture, provisioning of guaranteed service quality, two generations of the handover principles.			
16Y2TT	Transportation and Building Technology and Equipment	KZ	2
Transportation and building technology and equipment. Transport of solid and mass material, soil and rock above all. Highway and underground constructions. Transport surface vehicles, description and construction features, delivered mass calculation, economy of operation. Technics and technology of underground constructions. Terrestrial vehicles operation management methodology (ultrasound, laser, GPS, total stations).			
23Y2TP	Creation of legal and technical regulations	KZ	2
Creation of legislation, structure of the bills of law, legal process, compatibility with the EC law, the creation of technical standards and their publication, ÚNMZ (Czech Office for standards, metrology and testing) in Czech Republic, organizations CEN, CENELEC and ETSI, the notification process.			
12Y2UD	Sustainable Transportation	KZ	2
Sustainable development, definition, history, legal framework. Sustainable development indicators. Sustainable transportation, definition, history, legal framework. Practical application of sustainable development theory, case study.			
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
20Y2UA	Artificial Neural Networks, Realization and Applications	KZ	2
History of neural networks. Basic principles. Comparing the structure of a natural and an artificial neuron. Neural classifiers, predictors, compressors, expanders and other specialised functional blocs and systems. Modelling of neurons. Grossberg's equations. Learning principles. Layered and Hopfield's nets.			
18Y2UB	Accident Biomechanics and Safety	KZ	2
Anatomy of man. Methods of Medical Diagnostics - RTG, CT, MRI, US. Dynamics of traumatic events. Factors influencing the severity of an accident and the extent of a traffic accident. Injuries in road traffic. Pedestrian injuries. Injury in railway and air traffic accidents. Analysis of biomechanical events in accidents and their computational modeling. Principles of treatment and rehabilitation. Protective elements and safety measures in transport.			
23Y2VZ	Leadership and Human Resource Development	KZ	2
Introduction to the study of human resources, human resources management, corporate goals, strategies, cultural and ethical aspects. Team management, communication in teams, strategy and planning in human resources, ethics and corporate culture, cross-cultural differences. The labor code. Introduction into protocols.			
18Y2VC	Computational Mechanics in Transportation	KZ	2
Principle of virtual work and variational principles in FEM. Bar shaped, planar and three - dimensional structures in FEM. FEM in statics and in dynamics of transportational systems. Elastic, elastoplastic and viscoelastic material. FEM in problems of biomechanics. Numerical analysis of structural parts with programme ANSYS on instances.			
23Y2VR	Cope with Risks in Engineering Branches	KZ	2
Types of engineering branches directed to risks, procedures used in risk engineering, ensuring the secured systems, ensuring the safe systems, ensuring the safe systems of systems.			
12Y2VT	High Speed Railways	KZ	2
High speed rail (HSR) transport characteristics and position in transportation system. HSR vehicles types and characteristics and control-command and signalling system. HSR system interoperability. Non-adhesion HSR systems. City traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and geometrical characteristics.			
12Y2ZK	Traffic Calming	KZ	2
Principles of traffic calming. Solution of road network organization. Urban road layouts. Psychological and physical obstacles (measures of traffic calming) and their combinations. Traffic calming measures in crossroads. Pedestrian zones. Residential streets and zones.			
23Y2ZM	Intelligence Means and Methods	KZ	2
History and the present of intelligence services and their role in the modern world. How intelligence services handle with information. Methods and procedures of collecting and evaluating information. Means of intelligence services. Internal and external intelligence, military intelligence. The means and methods of state security services. Cooperation among Intelligence services within NATO, EU. The organization of the intelligence services.			

Name of the block: Jazyky

Minimal number of credits of the block: 8

The role of the block: J

Code of the group: JZ-N-LA 20/21

Name of the group: Jazyk nav.1.-4.sem. (od) 20/21 - program LA

Requirement credits in the group: In this group you have to gain 8 credits

Requirement courses in the group: In this group you have to complete 4 courses

Credits in the group: 8

Note on the group:

Code	Name of the course / Name of the group of courses (in case of groups of courses the list of codes of their members) <i>Tutors, authors and guarantors (gar.)</i>	Completion	Credits	Scope	Semester	Role
15J2F1	<b>Language - French 1</b> <i>Eva Rezlárová, Irena Veselková</i>	Z	2	0P+2C+10B	Z	J
15J2I1	<b>Language - Italian 1</b> <i>Eva Rezlárová, Irena Veselková</i>	Z	2	0P+2C+10B	Z	J
15J2N1	<b>Language - German 1</b> <i>Eva Rezlárová, Martina Navrátilová, Jana Štikarová</i>	Z	2	0P+2C+10B	Z	J
15J2R1	<b>Language - Russian 1</b> <i>Marie Michlová, Eva Rezlárová</i>	Z	2	0P+2C+10B	Z	J
15J2S1	<b>Language - Spanish 1</b> <i>Eva Rezlárová, Nina Hricšina Puškinová</i>	Z	2	0P+2C+10B	Z	J

15JBF2	<b>Language - French 2</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	2	0P+2C+10B	L	J
15JBI2	<b>Language - Italian 2</b> <i>Eva Rezlerová</i>	Z	2	0P+2C+10B	L	J
15JBN2	<b>Language - German 2</b> <i>Eva Rezlerová, Martina Navrátilová, Jana Štikarová</i>	Z	2	0P+2C+10B	L	J
15JBR2	<b>Language - Russian 2</b> <i>Marie Michlová, Eva Rezlerová</i>	Z	2	0P+2C+10B	L	J
15JBS2	<b>Language - Spanish 2</b> <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	0P+2C+10B	L	J
15JBF3	<b>Language - French 3</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	2	0P+2C+10B	Z	J
15JBI3	<b>Language - Italian 3</b> <i>Eva Rezlerová, Irena Veselková</i>	Z	2	0P+2C+10B	Z	J
15JBN3	<b>Language - German 3</b> <i>Eva Rezlerová, Martina Navrátilová, Jana Štikarová</i>	Z	2	0P+2C+10B	Z	J
15JBR3	<b>Language - Russian 3</b> <i>Marie Michlová, Eva Rezlerová</i>	Z	2	0P+2C+10B	Z	J
15JBS3	<b>Language - Spanish 3</b> <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	Z	2	0P+2C+10B	Z	J
15JBF4	<b>Language - French 4</b> <i>Eva Rezlerová, Irena Veselková</i>	ZK	2	0P+2C+10B	L	J
15JBI4	<b>Language - Italian 4</b> <i>Eva Rezlerová</i>	ZK	2	0P+2C+10B	L	J
15JBN4	<b>Language - German 4</b> <i>Eva Rezlerová, Martina Navrátilová, Jana Štikarová</i>	ZK	2	0P+2C+10B	L	J
15JBR4	<b>Language - Russian 4</b> <i>Marie Michlová, Eva Rezlerová</i>	ZK	2	0P+2C+10B	L	J
15JBS4	<b>Language - Spanish 4</b> <i>Eva Rezlerová, Nina Hricsina Puškinová</i>	ZK	2	0P+2C+10B	L	J

**Characteristics of the courses of this group of Study Plan: Code=JZ-N-LA 20/21 Name=Jazyk nav.1.-4.sem. (od) 20/21 - program LA**

15J2F1	Language - French 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2I1	Language - Italian 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2N1	Language - German 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2R1	Language - Russian 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2S1	Language - Spanish 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBF2	Language - French 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBI2	Language - Italian 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBN2	Language - German 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBR2	Language - Russian 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBS2	Language - Spanish 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			

15JBF3	Language - French 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBI3	Language - Italian 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN3	Language - German 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR3	Language - Russian 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS3	Language - Spanish 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBF4	Language - French 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBI4	Language - Italian 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN4	Language - German 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR4	Language - Russian 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS4	Language - Spanish 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			

### List of courses of this pass:

Code	Name of the course	Completion	Credits
11DOPM	Transportation Planning and Modeling	Z,ZK	6
Basic steps and tools used within four step model (trip generation, trip distribution, mode choice and trip distribution). Mobility and availability in urban areas, land use. New trends for transportation planning and modelling.			
11LIP2	Linear Programming 2	Z,ZK	3
Formulation of the task of integer programming, branch and bound method of numerical solution, problems about knapsack, travelling salesman, sets, location of stores and post boxes, tasks of scheduling, heuristics, metaheuristics - genetic algorithms, ant colony optimization.			
11STS	Stochastic Systems	Z,ZK	4
The subject deals with the problems of mathematical modelling of dynamical systems, estimation of these models and their utilization for prediction. The results are illustrated on practical transportation tasks. Mathematical theory roots from probability and mathematical statistics and they use the methods of the Bayesian probabilistic approach.			
11TER	Game Theory and Optimal Decision-Making	ZK	2
Decision-making theory, utility theory. Explicit form games, backward induction. Normal form games. Antagonistic conflict, matrix games. Repeated games, evolutionary game theory. Cooperative games without transferable payoffs. Cooperative games with transferable payoffs (imputation, core, Shapley value, nucleolus). Applications of game theory above all in economics and transportation.			
11THRO	Queuing Theory	ZK	2
Discrete event process, definition, random distribution, and probability. Basic processes, process of revitalisation. Markov process, Markov models, Kendall classification, model M/M/1, models M/M/n. Non-markovian models, model M/C/n, models G/G/n. Models with continuous flow. Service net, examples of Petri net. Computer simulation.			
11XN1	Master Project 1	Z	2
11XN2	Master Project 2	Z	2
11XN3	Master Project 3	Z	1
11XN4	Master Project 4	Z	8
11XNDM	Master Thesis for study programme LA	Z	18

11Y2FX	Functions of Complex Variable	KZ	2
Derivation of complex function, holomorphic function, complex exponential series, integration, Cauchy theorem. Taylor series, Laurent series of complex variable function. Basics of Laplace and Z-transformation.			
11Y2LG	Logics of Engineer's Judgement	KZ	2
Logical structure of engineer's judgement, its propositional and predicative logical base. Solutions of logical tasks through the methods of truthfulness and semantic analysis charts. Venn's diagram method. Logical basis for network design for the solution of technical tasks.			
11Y2PM	Programming in MATLAB	KZ	2
To explain the principle of modelling and simulation, description of Matlab environment and its settings, optimization and program code debugging, data fitting and designing GUI in Matlab.			
12XN1	Master Project 1	Z	2
12XN2	Master Project 2	Z	2
12XN3	Master Project 3	Z	1
12XN4	Master Project 4	Z	8
12XNDM	Master Thesis for study programme LA	Z	18
12Y2BM	Safety on The Local Roads	KZ	2
Classification of road accidents rates, social losses. Collision points, diagrams. Tools and methods for safer road transportation. Crossroads from the point of view of safety. Psychological right of way. Roundabouts. Pedestrian transport, cyclists. Traffic lights coordination. Transport control and regulation.			
12Y2DU	Transport in the Context of Sustainability	KZ	2
Definitions of sustainable transport, historical context, development in our country and in the world. Sustainable development and sustainable transport. Demand for transport. Induction of transport. Examples of sustainable transport. Biofuels. Electromobility. New trends in transport. Practical examples.			
12Y2IS	Urban Networks	KZ	2
The importance and the position of UN as public and technical infrastructure / utilities, methodology of the UN master planning, of UN design, UN coordination, UN installation and UN operation (basic technical standards of UN, trenchless technologies for UN).			
12Y2KE	Landscape Ecology	KZ	2
Landscape ecology. Landscape - definition, types, evolution. Landscape systems. Anthropogenic impacts on landscape. Methods using for evaluating landscape. Fractal geometry and its potential applications in landscape ecology. Landscape planning.			
12Y2KS	Rail Transport in Settlements and Regions	KZ	2
Modernization and development of railway infrastructure in Czech Republic. Arrangement of railway networks and junctions. Suburban railway services. Network configuration and operation of metro systems. Network configuration and operation of tram systems. Special thematic lectures (rail transport in selected countries / regions).			
12Y2MD	Methods of Traffic Regulation and Prediction	KZ	2
Basic ways of traffic prognosis, traffic prognosis for large area (calculation of future traffic volumes, calculation of future traffic volumes between areas (analogical and synthetic methods, modal split, traffic distribution to road network). Shock wave in traffic flow. Service levels and their traffic volumes. Acceleration noise.			
12Y2MH	Measurement and Modeling of Traffic Noise	KZ	2
Theoretical introduction to noise from traffic. Noise from rail transport. Noise from road traffic. Measurement and calculation of noise from rail traffic. Measurement and calculation of noise from road traffic. Modelling of traffic noise in the CADNA A.			
12Y2MI	Urban Engineering	KZ	2
Teaching aiming on utilities storage in area, coordination engineering activities in area, arrangement of public space, conception of public spaces.			
12Y2MZ	Modernization of Railway Lines and Stations	KZ	2
Line speed increasing. AGC and AGTC Agreement. AGC and AGTC railway network. Principles of modernization (conceptual papers, definitions of basic concepts, individual principles). Track geometrical characteristics on modernized railway lines. Superstructure and substructure on upgraded lines. Designing of railway stations. Bridges and tunnels. Development and realization of projects. Technical description of the transit corridors.			
12Y2RD	Realization of Transport Buildings	KZ	2
Transport Buildings Types. Project Documentation Types. Building Code. Land Permission and Building Permission Process. Building Process. Project Economics. Project Management.			
12Y2UD	Sustainable Transportation	KZ	2
Sustainable development, definition, history, legal framework. Sustainable development indicators. Sustainable transportation, definition, history, legal framework. Practical application of sustainable development theory, case study.			
12Y2VT	High Speed Railways	KZ	2
High speed rail (HSR) transport characteristics and position in transportation system. HSR vehicles types and characteristics and control-command and signalling system. HSR system interoperability. Non-adhesion HSR systems. City traffic service by HSR. HSR operating points. HSR worldwide network. HSR routing and traffic conception. Specifics of HSR track construction and geometrical characteristics.			
12Y2ZK	Traffic Calming	KZ	2
Principles of traffic calming. Solution of road network organization. Urban road layouts. Psychological and physical obstacles (measures of traffic calming) and their combinations. Traffic calming measures in crossroads. Pedestrian zones. Residential streets and zones.			
14BIG	Big Data	KZ	2
Principle of MapReduce. Basic Principles of Big Data Management. Comparison and Classification of NoSQL Databases. Key Database Value Database. Column Databases. Document Databases. Graph Databases-Basic Principles. Graph Databases-Advanced Aspects. Indexing. Interpretation. Advanced Principles Big Data Management. NewSQL Database. Cloud computing. Data warehouses and Big Data. Cloud computing. Data warehouses and Big Data. Other Big Data issues.			
14GISS	Geographical Information Systems	KZ	2
Construction of saving format of space-oriented information land-survey and cartography minimum basic tasks of spatial operations principles of territorial identification			
14TEL	Telecommunications	KZ	3
Status quo and new trends in telecommunications systems. Economical and legal aspects of telecommunications networks design and telecommunications services provisioning, identification and quantification of hierarchical telecommunications networks and telecommunication services performance based on adopted performance parameters, telecommunication services typically applied within transport and specifically logistic solutions.			
14XN1	Master Project 1	Z	2
14XN2	Master Project 2	Z	2
14XN3	Master Project 3	Z	1
14XN4	Master Project 4	Z	8
14XNDM	Master Thesis for study programme LA	Z	18

14Y2C1	CATIA I	KZ	2
Fundamentals of working with CATIA, making basic parts and bodies. Making 2D sketches, geometric structure, parametric linking, making adaptive models from 2D sketches. Import and export of made parts and bodies. Making assemble and visualization.			
14Y2C2	CATIA II	KZ	2
Extension of basic course. Modeling compound bodies. Possibility of enumeration, communications with other systems. Surface x solid bodies. Kinematic mechanism. Project making and project cooperation. Outputs of projects.			
14Y2CS	Sensitivity of Systems	KZ	2
Design of systems with defined reliability. The impact of changing parameters and subsystems within a system. System sensitivity computing, definition of sensitivity functions and matrices and their usability in system design.			
14Y2IS	Intelligent Systems in Postal Services	KZ	2
The use of information systems in the postal services (ITIS, and POST, T + T, PS, KMP, DS), application of information technology in the processing of mail processing nodes in the postal network, optimizing logistics processes in the post. The appreciation of the real implementation of the Czech post in operation both in lectures and in the framework of the practical desk.			
14Y2JM	One-Chip Controllers	KZ	2
One-chip controllers architecture, embedded peripherals (counters, timers, converters, ports) and their utilisation. Practical tasks are programmed with the aid of AVR chips.			
14Y2KI	Capital Investment in Transportation and Telecommunications	KZ	2
Financial market, investment decision making - long term goals and investment strategies, long term financing			
14Y2OP	Object Oriented Programming in Transport	KZ	2
Class, object, encapsulation, inheritance, polymorphism, templates, retying, stream, exceptions, repository, collections, virtual methods and classes. Problem cases will be chosen from microscopic simulation system, discrete event simulation, cellular automata simulation and virtual life area.			
14Y2PH	CAD Interface Programming	KZ	2
Introduction to CAD interface programming techniques with the help of LIST and VBA programming languages. Possibilities of proper objects (commands), dialogues, interfaces, and applications creation in CAD systems. Programming of cooperation with other applications (databases, spread-sheets).			
14Y2PI	Process Information Systems in Transportation	KZ	2
Introduction and detailed usage of transport information systems, e.g. EFC, ePurse and transport check-in systems for public transport with focus on architecture of this system and SOA (Service Oriented Architecture). Information systems implementation and operations description in the Czech Republic (technical and process) included lectures and visits.			
14Y2PJ	C++ Programming Language	KZ	2
OOP philosophy and basics of C++ programming language. Class, object, constructor, destructor, inheritance, abstract class, virtual methods, exceptions, streams, method and operator overloading, abstract data type implementation in C++.			
14Y2TU	Telecommunications Systems and Multimedia	KZ	2
New trends in telecommunications namely applied in transport solutions, identification and quantification of telecommunications networks and services performance based on redundant architecture, provisioning of guaranteed service quality, two generations of the handover principles.			
14Y2UI	Artificial Intelligence	KZ	2
History of artificial intelligence, knowledge, its representation including frames, state space search, constraints, genetic algorithms, machine learning.			
15J2A1	Language - English 1	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			
15J2F1	Language - French 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2I1	Language - Italian 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2N1	Language - German 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2R1	Language - Russian 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15J2S1	Language - Spanish 1	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBA2	Language - English 2	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement.			
15JBA3	Language - English 3	Z	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.			
15JBA4	Language - English 4	ZK	2
Presentation Skills - expert technical discourse and style; Analysis of expert texts and their production; Preparation for overseas work engagement. Optional courses for certificates FCE, CAE.			
15JBF2	Language - French 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			



15JBF3	Language - French 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBF4	Language - French 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBI2	Language - Italian 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBI3	Language - Italian 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBI4	Language - Italian 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN2	Language - German 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBN3	Language - German 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBN4	Language - German 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR2	Language - Russian 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBR3	Language - Russian 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBR4	Language - Russian 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS2	Language - Spanish 2	Z	2
Grammatical Structures and Style. Selection of conversation topics relating to transportation sciences. Developing perceptive and communicative skills, feedback skills, summarising technical text content, structuring presentations and meeting minutes, elementary rhetorics of foreign language and practical application, formal and technical registers and their use, language of management.			
15JBS3	Language - Spanish 3	Z	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15JBS4	Language - Spanish 4	ZK	2
Grammar and stylistics. Selection of conversation and professional topics based on the language level and study focus at the Faculty. Improvement of language structure knowledge and perceptive and communicative skills, vocabulary development. Basic stylistic forms. Presentation of own knowledge in oral and written form. Work with (professional) text and its features. Practice of oral and written presentation.			
15XN1	Master Project 1	Z	2
15XN2	Master Project 2	Z	2
15XN3	Master Project 3	Z	1
15XN4	Master Project 4	Z	8
15XNDM	Master Thesis for study programme LA	Z	18
15Y2DN	Transportation Psychology in German Speaking Countries	KZ	2
Introduction into broader view of traffic problems with regard to the work with texts (Physics for drivers, abusing alcohol during driving, exhaustion, getting of driving licence, children in traffic, traffic accident, traffic psychology in the internet etc.)			
15Y2HS	Road Transport History	KZ	2
Roads and road traffic in the Ancient Age, corridors of main medieval pathways. Development of road traffic in the modern period, acceleration of road transport development during 1st part of 20th century. Development of road layout, geometric and construction layers. Beginning of modern road civil engineering. Development of road travelling in modern period. History of road intercections, bridges and traffic control, development of road signs.			
15Y2JH	Job Hunting in English	KZ	2
The course provides a practical guide to applying for a job in English. The interview process is mapped out, with the course including skills practise for all the stages of this process, including specifics for job-hunting in English. Students will also be introduced to the English vocabulary and phraseology necessary for a successful interview.			

15Y2MS	<b>Sociology for Managers</b> Sociological approach to a corporation. Corporation and its organization. Corporation and its running - human role and communication. Corporation, its culture and social system. Human's work position in free market economy. Corporate directorship, work groups, adaptation, strife, different roles and positions in corporation.	KZ	2
15Y2OF	<b>Specialised French for Transportation and Telecommunications</b> Basic transportation (public transport, railway, air, road and ship transport) and telecommunications terminology. Special focus on independent speaking and writing skills.	KZ	2
15Y2OZ	<b>Health Protection in Transportation and EU</b> Health protection in transportation in CR in the past and present. Conditions before 1989 and after, current legislature, future prospects. Harmonisation of legislation with other EU members. Fundamental principles of health protection and support in selected EU countries.	KZ	2
15Y2PD	<b>Practical Spanish for Transportation</b> Development of communication skills, training of correct written expression of formal character, basic technical vocabulary, cultural specifics of the Spanish speaking countries. Terminology of transport and commerce.	KZ	2
15Y2PT	<b>Food in Transportation</b> The nutrition policy. Interaction transportation and foodstuffs. The health risks. Hygienic safeguard. The practical examples from the Czech Republic and from the world. The issues of dining cars, work trains and other railroad equipment. Legislation.	KZ	2
15Y2PU	<b>Publications and Their Creation</b> Scientific texts types. Footnotes and references. Exploration of facts. Quotations. Formal document layout. Working with information databases. Typographic principles. Typographic editors - MS Word, Tex/LaTeX. Practical creation of simple scientific documents.	KZ	2
15Y2SP	<b>Seminar on Political Philosophy</b> Interpreting of philosophical texts, view of society, state and their system of government.	KZ	2
15Y2SR	<b>Stylistics and Rhetorics</b> Basic skills of oral and written expression as a means of human communication. Basic information about speech, articulation, oral and written language. Teaching to speak well-vocal organs, voice training. Language semantics, language syntactic and the pragmatic aspect. Creative thought and its oral and written expression. Practice - cultivating the skills of speech.	KZ	2
15Y2TS	<b>Technician and Contemporary Society</b> Why to take off a hat in a room and open a door for a lady, are there simple solutions, science vs belief, do we need to know or is it enough to turn on a PC, it must be true - it's on the Internet and in newspapers, what are the sights for, interest in public affairs - a hangover from the past?	KZ	2
16XN1	<b>Master Project 1</b>	Z	2
16XN2	<b>Master Project 2</b>	Z	2
16XN3	<b>Master Project 3</b>	Z	1
16XN4	<b>Master Project 4</b>	Z	8
16XNDM	<b>Master Thesis for study programme LA</b>	Z	18
16Y2EE	<b>Emissions and Ergonomics of Vehicles</b> Emissions and ergonomomy of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomy - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredom.	KZ	2
16Y2HP	<b>Vehicle Hygiene</b> Emissions and ergonomomy of vehicles and the influence on man and nature. National and international law related to the hygiene. Noise and vibrations - sources, creation, propagation, physical values, ways of measuring, prevention, elimination. Exhausts - creation, measurement, reduction, non-regular fuels and drives. Ergonomy - sitting, standing, control, operational reach. Condition - heating, ventilation, air-conditioning, filtration, tiredom.	KZ	2
16Y2KV	<b>Car Body Design</b> Personal cars body, high-load car body, bus car body, and motorcycle as a construction set. Principles of design, production, testing and operation. Materials used for car body construction. Active and passive safety parts. Ergonomics, HMI, view out of the vehicle, operational extent, view behind the car. Conditioning tools, signaling function. Aerodynamics of the car body. Design and artistic design principles. Practical training.	KZ	2
16Y2MK	<b>Quality Methods for Vehicles</b> Quality management methods list, customer data acquisition and analysis of customer requirements, QFD, DFM, DFA, DFS. FMEA (Failure mode effect analysis). Elements of parallel (team) design.	KZ	2
16Y2PG	<b>Computer Graphics and Virtual Reality</b> Principles of creation and processing of bitmap and vector 2D graphics, 3D virtual scenes and algorithms used for their computerized processing. Adopting skills of work with professional and freeware tools for creation and processing of 2D, 3D and interactive graphics, and basics of programming language VRML and graphic libraries (OpenGL).	KZ	2
16Y2ST	<b>Special Technologies in Transport and Telecommunications</b> Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas.	KZ	2
16Y2SV	<b>Special technologies in vehicle manufacturing</b> Micro, nano and special technologies, electric arc and its applications, plasma technologies, dipping, beam technologies, electron beams technology in roduction and mending of vehicles, laser and laser technologies, soldering, gluing, ultrasound, diffusion, friction and explosion technologies, micro stoves, gas.	KZ	2
16Y2TT	<b>Transportation and Building Technology and Equipment</b> Transportation and building technology and equipment. Transport of solid and mass material, soil and rock above all. Highway and underground constructions. Transport surface vehicles, description and construction features, delivered mass calculation, economy of operation. Technics and technology of underground constructions. Terrestrial vehicles operation management methodology (ultrasound, laser, GPS, total stations).	KZ	2
17AMAN	<b>Application of Marketing Tools in Transport Industry</b> Strategic marketing plans. Implementation of marketing campaigns. Branding and brand promotion. Multimedia presentations. Direct marketing and related lead generation campaigns.	KZ	3
17DOCH	<b>Travel Behavior</b> Investigation of causal effects in travel behavior research (quasi-experimental and experimental approaches). Data collection (theory of measurement; design of research instrument and data collection). Analysis and interpretation of data (advanced regression models; issues of analysis and interpretation of results: effect size, practical vs. statistical significance). Analysis and interpr. of data (surveys, choice exp., panel. data).	KZ	3
17KMD	<b>Quantitative Methods in Transport</b> The course focuses on the issue of the use of undirected graphs tree type, planar graphs and their coloring. Further distribution problems, facility location problems are formulated and solved such as models of integer linear programming. Besides the use of exact methods there are described simple and also more sofisticated heuristics (metaheuristics) methods.	Z,ZK	6

17LSC	Logistics in Smart Cities	Z,ZK	6
Development of cities in time, city and region, mobility of city residents and movement of goods, sustainability as a concept, Smart Cities, city as a system and its components, quality of life, individual quality of life, city "smartness" assessment, legislation in Smart Cities, Smart Cities transformation, last mile logistics, e-commerce, new approaches in last mile logistics, last mile logistics in cities and in regions.			
17MADS	Management of Transport Systems	KZ	2
Functions, processes and systems of management in transport, organisational structures, strategy, social responsibility, soft skills.			
17MID	Managerial Information Systems in Transport	Z,ZK	3
IT and their use in building IS of modern transport company. New EU legislation on cyber security and data protection puts transport organizations in front of new challenges. The course focuses on the security of IS and possible sources of danger. The practical part deals with the process of building a new IS from the idea through the timetable and the financial budget, the basic documents for the possible assignment of the contract.			
17PPC	Carriage Processes	ZK	3
Domestic carriages, international carriages, nomenclature of goods, pricing, contracting, responsibility for damages.			
17RKOP	Management of commercial projects in transport	Z,ZK	3
Business project (customer, activities, output - quality, time, money), project surroundings, location of the project (area analysis, traffic flows, authorization procedure), organizational structure of the project, sources of financing, customer-supplier relations, feasibility studies, sensitivity and multi-criteria analysis, financial and value analysis, management of project changes.			
17RVIP	Public Project Management in Transport	Z,ZK	5
Basic concepts of project management in the public sector, used procedures and standards of project management, organizational structure in project management in the public sector, project and pre-project preparation in transport and transport infrastructure and their specifics, feasibility study and CBA, project evaluation.			
17TSI	Technology of Road Transport	KZ	2
Legislative, operational, technical, logistic and safety conditions of road transport, basic transport technologies, special transport, international agreements, requirements on the parameters and specialization of transport, handling and loading/unloading means, maintenance, service and repairs of road vehicles, safety of road transport and choice of optimal transport unit.			
17TZND	Technology of Railway Transport	Z,ZK	4
Track line capacity assesment, model operational situation with a system running time between IPT-nodes, calculation of traction energy savings compared with infrastructure costs for designing of fleeting crossing station, solving of capacity problem and blocking time in relation to train protection system, robustness of timetable, system concept of freight train paths, guidelines for centralised operational traffic control and management.			
17TZOR	Inventory, Replacement and Scheduling Theory	Z,ZK	3
Inventory theory - introduction, static models, deterministic dynamic models, stochastic dynamic models. Replacement theory - introduction, models for replacement of items that deteriorate with time, models for replacement of items that fail completely. Scheduling theory - introduction, single machine scheduling problems, parallel machine scheduling problems, flow shop scheduling problems and job shop scheduling problems.			
17XN1	Master Project 1	Z	2
17XN2	Master Project 2	Z	2
17XN3	Master Project 3	Z	1
17XN4	Master Project 4	Z	8
17XNDM	Master Thesis for study programme LA	Z	18
17Y2AM	Application of Marketing Tools in Transportation	KZ	2
Application of marketing principles in transport issues, marketing tools suitable for transport, case studies of the use of marketing in the sphere of public passenger transport.			
17Y2FM	Financing in Urban Mass Transportation	KZ	2
UMT history and development in Prague and other cities in the world. Building and operation of public tram, bus, and trolleybus networks. Underground building and operation. Other UMT types. UMT development in small towns. Particularities of investment and operation financing of individual UMT types. Historic and present models of UMT financing. Transport inspection and blind passengers. Tourism & UMT. UMT typology & choice of optimum financing.			
17Y2MO	International Organisations in Transportation	KZ	2
International relations in transport, UN, EEC UN, Intergovernmental organisations, EU Offices and Agencies, Conference of European Ministries of transport, International mode organisations of public transport, Air-Rail, railways, roads, air, waterways, forwarding and postal services.			
17Y2MS	Microsimulation of Railway Operation	KZ	2
Introduction to the characteristics of simulation tools, creation of a simulation model of railway infrastructure, verification of a specific operational concept on the given infrastructure, adaptation of the infrastructure model and modification to the infrastructure to allow the implementation of the proposed operational concept. Stability tests and evaluations. Evaluation of sensitivity of the operational concept to delays.			
17Y2MT	Modern History for Engineering Students	KZ	2
Selected chapters from the 19. century history. Geopolitical situation in Europe explained on the examples of Great Britain, Germany and Austrian Empire. Rise of the United States, American Civil War, transatlantic transportation development. Imperial China: Late Qing dynasty. Selected chapters from the 20. century history: From Bellé Epoque to Cold War. Czechoslovak historical myths.			
17Y2PS	Case Studies in Transportation	KZ	2
Simulation expert discussions on the topics - the impact of transport on the environment and the economy, energy, construction of transport infrastructure etc. The students will each lesson presented one current and the real issue, which solutions will have to think of each other. Each of them will be represent another role (public authorities, investors, carrier representative interest groups, residents, etc.).			
17Y2RZ	Control of Transport Processes	KZ	2
Theoretical bases, transport system, decomposition, factors influencing control, quality diagnosis, methods of control, systems for decision making support, risk of decision making, telematics.			
17Y2SJ	Network Timetabling on the Railway	KZ	2
Timetable samples. Capacity allocation, technological intervals in railway operation. Rules and regulations of train paths, running times, time adds and supplements. Rolling stock circulation planning. Rules of train-diagramm creating. Timetables for more service-levels on the line. Construction slot conflicts between passenger- and freight transport. Network line relations and waiting times, timetables for lines under construction.			
17Y2SK	Urban and Regional Rail Transport System	KZ	2
Factors influencing transport demand, modal-split, traffic flows distribution on public transit network. Line network optimization and configuration. Timetable designing and evaluation accenting integrated periodic timetable. Rolling stock circulation, staff and crew services optimization and their order to rosters. Framework legislation, non-barrier effects and preference of public transport. Marketing.			
18XN1	Master Project 1	Z	2
18XN2	Master Project 2	Z	2

18XN3	Master Project 3	Z	1
18XN4	Master Project 4	Z	8
18XNDM	Master Thesis for study programme LA	Z	18
18Y2DC	Dynamics of Transport Routes and Vehicles	KZ	2
Basic theory and calculations of more mass systems. Analysis of the forces acting between the vehicle and transport route. Creation of dynamic models of vehicles and transport routes. Vibration of systems with a finite number of degrees of freedom. Methods of stiffness constants and pliability constants. Fundamentals of vibration of bridges. Criteria for the admissibility of oscillation. Experimental methods in dynamics.			
18Y2FZ	Physical foundation of materials' properties	KZ	2
Atomistic models, lattice defects influence on properties of materials, stiffness, plasticity, strength, fracture, fatigue, creep, corrosion, effects of environment and loading on materials' behavior are the main discussed topics.			
18Y2MP	Finite Element Method And Its Application	KZ	2
Basic mathematical formulation of the Finite Element Method. Direct Stiffness Method used in structural mechanics. Evaluation of stiffness matrices for the basic elements using variational principles. Element formulation (bar and beam elements, CST, LST, quadrilateral, tetrahedral and brick elements). Natural coordinates, natural shape functions and isoparametric representation. Numerical integration. Introduction to dynamics. FEM programming.			
18Y2OB	Optical Contactless Strain Measurements	KZ	2
In the course students will get theoretical knowledge and practical experience in optical strain measurement methods. Students will get experience with use of laboratory cameras, DSLRs and high speed cameras for acquisition of suitable image data and with digital image correlation algorithms for displacements measurements and strain fields calculation.			
18Y2SD	Reliability and Diagnostics, Experimental Methods	KZ	2
The course is focused on theoretical background and practical experience in the field of reliability of constructions, implementation of diagnostic procedures for the detection of material defects and determination of residual life of structures. For this purpose, non-destructive methods of experimental mechanics (e. g. strain-gauge measurement, photoelasticimetry) and optical methods, including electron microscopy, will be used.			
18Y2UB	Accident Biomechanics and Safety	KZ	2
Anatomy of man. Methods of Medical Diagnostics - RTG, CT, MRI, US. Dynamics of traumatic events. Factors influencing the severity of an accident and the extent of a traffic accident. Injuries in road traffic. Pedestrian injuries. Injury in railway and air traffic accidents. Analysis of biomechanical events in accidents and their computational modeling. Principles of treatment and rehabilitation. Protective elements and safety measures in transport.			
18Y2VC	Computational Mechanics in Transportation	KZ	2
Principle of virtual work and variational principles in FEM. Bar shaped, planar and three - dimensional structures in FEM. FEM in statics and in dynamics of transportation systems. Elastic, elastoplastic and viscoelastic material. FEM in problems of biomechanics. Numerical analysis of structural parts with programme ANSYS on instances.			
20XN1	Master Project 1	Z	2
20XN2	Master Project 2	Z	2
20XN3	Master Project 3	Z	1
20XN4	Master Project 4	Z	8
20XNDM	Master Thesis for study programme LA	Z	18
20Y2PR	Prediction of time series	KZ	2
Introduction to time series prediction, meaning of prediction, basics of quantitative prediction. Methods for predictive quality evaluation, descriptive statistics, MAE, MAPE, RMSE, naive prediction, prediction for general formula of loss function. Calculation and programming environment R. Regression models, basics of linear regression, simple regression. Multiple regression, statistical tests of linear dependence, selection of input variables.			
20Y2TE	Technology of Electronic Systems	KZ	2
Principle technologies for an effective operation of electronically controlled systems. Maintaining, measuring, optimization of safety and reliability of complex systems. Semiconductor technologies, printed circuits, assembly operations, interconnection and repairs technologies users and operators.			
20Y2UA	Artificial Neural Networks, Realization and Applications	KZ	2
History of neural networks. Basic principles. Comparing the structure of a natural and an artificial neuron. Neural classifiers, predictors, compressors, expanders and other specialised functional blocs and systems. Modelling of neurons. Grossberg's equations. Learning principles. Layered and Hopfield's nets.			
21XN1	Master Project 1	Z	2
21XN2	Master Project 2	Z	2
21XN3	Master Project 3	Z	1
21XN4	Master Project 4	Z	8
21XNDM	Master Thesis for study programme LA	Z	18
21Y2BS	Unmanned aircraft systems 2	KZ	2
Modern trends in unmanned aircraft development. Use of unmanned aircraft. Managerial activities related to the operation of unmanned aircraft. Flights beyond the applicable legislation.			
21Y2LS	Air Traffic Services	KZ	2
Airspace structure in Czech Republic and other countries. Introduction and description of ATS units in Czech Republic. Practical examples of TWR, APP a ACC control. History of ATS at USA and Czechoslovakia. ATS - Model of financing. Training Systém of Air Traffic Controllers. Future development of ATS.			
21Y2MS	Aerospace Engineering Simulation and Modelling	KZ	2
The course is designed as a set of exemplary tasks and problems based on practical aviation issues. The university degree mathematic skills and software applications usage will be necessary for successful figuring out. Both simple tasks, where students create own model themselves (e.g. in Matlab), and more complicated problems where professional developed tools will be applied.			
21Y2PL	Operational Aspects of Aerodromes	KZ	2
Operational aspects of aerodromes. Location of aerodrome and orientation of runways. Requirements for apron. Capacity of airports runways and terminals. Operation under winter conditions. Firefighting units. Protection against unlawful interference. Local transport connection. Environmental protection.			
21Y2PP	Law and Operation in Air Transport	KZ	2
Development of aviation law. International conventions on civil aviation. International organisations and including of the Czech Republic in these organisations. EU legislation and civil aviation. Execution of state administration and state supervision in matters of civil aviation, in accordance with Act No. 49/1997 Col. Facilitation. Responsibilities of air carriers for passengers, luggage and cargo. The safe transport of dangerous goods.			
21Y2S1	Diploma Thesis Seminar 1	KZ	2
Types of final theses (review, applied research, basic research, work dealing with design proposals). Working with citation sources (citation databases, citation styles). Analysis of the current state (writing standards). Definition of the limitations of the current state. Introduction to the methodology of writing final theses.			

21Y2S2	Diploma Thesis Seminar 2	KZ	2
Methodology of writing final theses. Definition of materials and methods, approach to obtaining results, presentation and discussion of results, formulation of conclusions. Data collection and presentation, basic statistics, validation of results and proposals. Achieving the objectives of the paper and evaluation of hypotheses tests. Formal and graphic design of the paper - working with LaTeX and Word template.			
22XN1	Master Project 1	Z	2
22XN2	Master Project 2	Z	2
22XN3	Master Project 3	Z	1
22XN4	Master Project 4	Z	8
22XNDM	Master Thesis for study programme LA	Z	18
22Y2PS	Traffic Accidents Computer Simulation and Analysis	KZ	2
Vehicle dynamics simulation, multi body systems and vehicle active safety systems, vehicle slipping, external influence on virtual model, crash tests evaluation, single-track vehicle, vehicle passengers, pedestrian, traffic accident simulation and analysis.			
23XN1	Master Project 1	Z	2
23XN2	Master Project 2	Z	2
23XN3	Master Project 3	Z	1
23XN4	Master Project 4	Z	8
23XNDM	Master Thesis for study programme LA	Z	18
23Y2BP	Security Class	KZ	2
The most prevalent topics include data management, data and text mining applications, terrorism informatics, deception and intent detection, terrorist and criminal social network analysis, crime analysis, cyber-infrastructure protection, transportation infrastructure security, and information assurance, among others.			
23Y2FB	Physics for Security Branches	KZ	2
Grounds of physics of substances and phenomena at extreme conditions. Grounds of rheology. Physics of Earth's interior. Geophysics. Physics of atmosphere. Applications in engineering branches directed to safety.			
23Y2MA	Risk Analysis and Management	KZ	2
Concept of risks and terms. Risk sources, definition of hazard, impacts and risks. Methods for identification, analysis, assessment and management of risks. Risk engineering targets and good engineering practice. Methods, tools and techniques for risk engineering. System of systems risk. Application of strategic and system approach for benefit of security and development. Territorial, emergency and crisis planning. Human factor - its role.			
23Y2PD	Practical vehicle dynamics	KZ	2
Theory of vehicle dynamics. Multibody vehicle modeling. Modeling with IPG CarMaker. Standard and development stage experiments with road vehicles. Realization of experimental measurements with passenger vehicles. Experiment evaluation.			
23Y2TP	Creation of legal and technical regulations	KZ	2
Creation of legislation, structure of the bills of law, legal process, compatibility with the EC law, the creation of technical standards and their publication, ÚNMZ (Czech Office for standards, metrology and testing) in Czech Republic, organizations CEN, CENELEC and ETSI, the notification process.			
23Y2VR	Cope with Risks in Engineering Branches	KZ	2
Types of engineering branches directed to risks, procedures used in risk engineering, ensuring the secured systems, ensuring the safe systems of systems.			
23Y2VZ	Leadership and Human Resource Development	KZ	2
Introduction to the study of human resources, human resources management, corporate goals, strategies, cultural and ethical aspects. Team management, communication in teams, strategy and planning in human resources, ethics and corporate culture, cross-cultural differences. The labor code. Introduction into protocols.			
23Y2ZM	Intelligence Means and Methods	KZ	2
History and the present of intelligence services and their role in the modern world. How intelligence services handle with information. Methods and procedures of collecting and evaluating information. Means of intelligence services. Internal and external intelligence, military intelligence. The means and methods of state security services. Cooperation among Intelligence services within NATO, EU. The organization of the intelligence services.			

For updated information see <http://bilakniha.cvut.cz/en/FF.html>

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